

1916.
NEW ZEALAND.

DEPARTMENT OF AGRICULTURE, INDUSTRIES, AND
COMMERCE.

ANNUAL REPORT FOR 1915-16.

Presented to both Houses of Parliament by Command of His Excellency.

Department of Agriculture, Industries, and Commerce,
Wellington, 26th June, 1916.

MY LORD,—

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

I have, &c.,

W. D. S. MACDONALD,
Minister of Agriculture.

His Excellency the Earl of Liverpool, Governor of New Zealand.

REPORT OF THE MINISTER OF AGRICULTURE.

DURING the whole of the year now reviewed the agriculture of New Zealand has proceeded under the stimulus of the Great War, with its huge demand for food and clothing for the Empire and Allied Forces. Another immensely enhanced record has been made in the value of our agricultural exports, while the volume of production has also substantially increased. The resulting great surplus of funds credited to the Dominion has provided the farming industry with means for development at a time when dependence on outside capital might have proved futile.

The buoyancy of the national revenue—due also mainly to the large returns received by the country from primary products—has enabled State expenditure on agricultural advancement to be well maintained. Our primary products may be legitimately regarded as munitions of war, and money spent by the State in promoting increased production is in effect helping to win the war. Nevertheless various much-required extensions of the activities of the Department of Agriculture could not be undertaken under existing conditions, and several important schemes involving additional outlay have had to be deferred.

A very favourable season in general was experienced by the larger part of the Dominion—the whole of the North Island, Southland, and South Otago in particular. Canterbury, North Otago, and to a great extent Marlborough, unfortunately suffered from prolonged droughty weather, which, following a previous dry season, was very severely felt. It is pleasing to record that towards the end of the period under review these adverse conditions were relieved by genial rains, since when the much-tried districts have made a good recovery.

While the year has been one of great prosperity to the agricultural community in general, it should not be overlooked that the high prices of commodities now ruling are not all on the primary producer's side. The farmer has had to pay largely increased prices for implements, fencing-material, fertilizers, and other requirements of his business; the great rise in freight rates on produce exports has also been against him.

Largely increased areas, as compared with the previous year, were sown in cereals, and under normal conditions a heavy total production of wheat would have resulted. Owing, however, to the persistently dry weather and other adverse conditions in Canterbury, which, as the "granary of New Zealand," dominates the position, the average per-acre yield of wheat

was reduced to little more than two-thirds of the average over a number of years. The outcome has been a total production of wheat hardly greater than that yielded by the previous year's lesser acreage. The requirements of the Dominion are, however, covered—a matter for genuine satisfaction in these times of general economic disturbance. It is much to be regretted that wheat-growers as a whole were neither favoured by yield nor market, and on broad national grounds the hope is expressed that the area devoted to this vital crop may not be materially reduced for next season in consequence. Commendable enterprise appears to have been shown in the chief cereal districts during the past autumn as regards winter-wheat sowing, and if this is followed up by reasonably liberal spring sowings the position should be fairly well assured. Taking the Dominion as a whole the production of annual field crops, apart from wheat, last season was fairly satisfactory, and does not call for special comment.

In regard to field cropping in the Dominion generally, there would appear to be some need for greater adaptability in methods of cultivation. Varying climatic conditions require to be anticipated and provided against to a greater extent. In districts where droughty seasons have proved to be not uncommon a modified form of "dry farming" would probably be sound practice, profitable both to the farmer and country.

While animal-products, such as meat, dairy-produce, and wool, remain the chief agricultural staples of New Zealand, the factor of pastures must always be one of supreme importance. With the exception of the dry districts previously named, the past season's grass crop was good and grazing operations favoured. Although the Dominion as a whole has a well-deserved fame pastorally, there can be no doubt that the larger part of the grass pasture, especially so-called permanent pasture, is capable of very great improvement. This is a subject which is now receiving particular attention from the Department, and valuable results may be expected in due course from these investigations. There is also great necessity for widespread establishment of more or less permanent forage crops that will thrive in dry weather and stand judicious grazing. Lucerne, well managed, undoubtedly fills these latter requirements. It is already successfully grown on a fairly large scale in several districts, and plot tests in every part of the country have put the crop past the experimental stage. The time appears to be ripe for a general forward movement in lucerne-cultivation, and there are indications that such a movement is steadily gathering way. These remarks are largely prompted by consideration of the hard experience last season of hundreds, if not thousands, of farmers in the dry districts and of the great loss of wealth which might have been avoided by more adaptive grazing practice.

The health of the live-stock as a whole was good throughout the year. Constant vigilance is needed, however, to maintain the high reputation of the Dominion in regard to freedom from animal-disease. Judging by the year's data more active steps are necessary in order to get tuberculosis in cattle and pigs fully under control. With the co-operation of stockowners in adopting preventive measures there is no reason why the comparatively small incidence of this disease in New Zealand should not be reduced to vanishing-point. Some troublesome outbreaks of blackleg among young cattle in certain parts of the South Auckland district have been met by quarantining and inoculation measures similar to those which have been so successful in controlling this disease in Taranaki. Several other animal troubles of lesser import have been overcome or are under investigation by the veterinary officers.

The year's wool-clip was satisfactory in general as regards both quality and quantity, while further advances were recorded in prices. Wool thus easily maintained its position in point of value at the top of the list of New Zealand exports. Combining with wool the value of the mutton and lamb output, together with skins and sundries, the supremacy of the sheep in New Zealand agricultural production is more outstanding than ever.

A further marked expansion of the frozen-meat industry took place during the year, several new works having been completed and others commenced. A large increase in the cold-storage accommodation of existing works was also effected. These developments have enabled the growing output of the industry to be handled with comparative ease. A serious block in shipments, owing to insufficiency of refrigerated tonnage, attained its greatest height during the latter part of the 1914-15 meat season, but accumulated stocks were completely cleared before the new season's trade began in any volume. Large accumulations have again taken place at the works this season, but no anxiety is now felt in regard to the situation. The output of frozen meat, mainly owing to the large increase in beef, has constituted a fresh record, and the trade has proceeded steadily under the Imperial purchase scheme.

A serious aspect of the meat industry lies in the continued over-slaughtering of young stock—females in particular. Data recently collected show conclusively that this practice is on the increase as regards cattle, while the 1915 sheep returns disclosed a heavy decrease in breeding-ewes. The keen demand and very high prices ruling for freezing-stock are, of course, mainly

responsible for the movement. The operation of supply and demand might be expected to adjust the matter as between stock for fattening and breeding-stock, but in the meantime our flocks and herds are being unduly depleted, and it is becoming increasingly difficult to secure suitable stock for newly cleared country. This latter fact is, indeed, the gravest side of the matter, owing to its far-reaching effects in the economy of settlement and on the country's future production of meat, wool, &c. Definite action appears to be necessary in the general interest to check the practice referred to, and an opportunity may perhaps be found in the present controlled state of the meat-export trade.

The principal dairying districts were favoured in general by an excellent season. A further marked expansion took place in the cheese industry, with a corresponding increase in the output of cheese. The butter exports showed a slight decrease, but, on the other hand, a larger quantity than last year was held in cold store at the end of the period, while the local market naturally absorbs greater supplies year by year. The good season, combined with the exceedingly high prices received for both butter and cheese, have brought a year of great prosperity to the dairy industry as a whole. Unfortunately the position is not without its adverse features. Part of the butter output is not maintaining the high standard so long associated with the New Zealand creamery article. Faulty methods in the home-separation system are largely responsible for this, but conditions on a large proportion of the farms as regards the cleanly care of milking-machines, separators, and other apparatus are also much at fault. A large increase of instructional inspection on the farms is a pressing need, and an effort will be made to supply this service with as little delay as possible. The quality of cheese showed some falling-off as compared with last year, due in many cases to faulty manufacture. The unusually hot weather which set in after the new year also told very adversely on much of the cheese-output, throwing up weak points in the industry such as deficiency in cool storage at the factories, in coastal transit, and at some of the ports of shipment. Steps are now being taken, notably at Wellington, the principal cheese-shipping centre, to supply the necessary port cool storage. It is only fair to state that the cheese industry has been much hampered during the season by war conditions, involving a shortage of shipping facilities and a deficiency of skilled labour, besides the other factors referred to.

A noteworthy feature of the dairying year was the requisitioning on Imperial account, at a fixed price, of one-third of the output of the cheese-factories, an operation covering approximately 15,000 tons at an outlay of one million sterling.

The herd-testing association movement has shown some expansion during the year in the North Island, but the South Island still lags behind as regards this useful adjunct of dairying progress. A good year's operations have been carried out under the system of semi-official or certificate-of-record testing of purebred dairy cows. This State service continues to exert a highly beneficial effect on the breeding side of the dairy industry.

The fruitgrowing industry continues to develop steadily. A substantially increased area was planted during the 1915 planting season, and the aggregate area of commercial orchards in the Dominion is now approximating 50,000 acres. Considerable work tending to the advancement of the industry has been carried out during the year. The central organization of the fruitgrowers has been reconstructed on effectively-drawn lines, in connection with which certain legislation is now in hand. A conference of representatives of the fruitgrowers, the nurserymen, and the Department dealt with a great weakness of the industry—namely, the undue multiplication of varieties of fruit-trees—and drew up much-reduced lists of the most suitable varieties for commercial growing for various markets. Much benefit should accrue from this action. The movement for central fruit-packing depots and cool stores is progressing by the erection of several of such establishments. The apple-export trade which had been built up with South American markets continued in the 1915 shipping season, but was cut short this year by the diversion of the Home steamers from the Cape Horn track to other routes. The local market, however, has shown its capacity to absorb the season's production at prices satisfactory to the growers. The "apple-fair" system of promoting local consumption was initiated recently in this country by a successful fair held at Wellington. A surplus production of fruit is bound to take place in the near future, however, and active steps are proposed to be taken to secure markets in the Northern Hemisphere.

The production of honey has varied very much according to climatic conditions in the several districts, but, speaking generally, the beekeeping industry has progressed in a satisfactory manner, and improved marketing organization has resulted in better prices for the apiarist. The official system of grading honey for export is now in full working, and will doubtless prove of great benefit to the trade.

Utility poultry-keeping has made further progress both on a commercial scale and as a side-line. The attention given to breeding of late years is now yielding good results. The organization of the industry is being steadily effected, especially as regards marketing. The local markets have shown their capacity to easily absorb the increased egg-production at average prices very remunerative to the producer, while there is a standing unsatisfied demand for well-fattened table-poultry.

Stimulated by record prices, the hemp industry has shown great activity and a largely increased production. During the latter part of the year trade was hampered by lack of shipping space in the Home steamers, but the position has since been partially relieved. A considerably larger proportion of low-grade fibre was produced as compared with the previous year, and the same remark applies to tow. This is a regrettable feature, tending to react unfavourably on the trade, especially when world-conditions become normal again. During the year the attacks of the grub *Xanthorhoe praefectata* caused serious damage to the phormium-leaf in the Makerua Swamp, one of the most important sources of supply of the raw material of the industry. An experienced entomologist is now specially investigating this pest with a view to its control.

The allied subjects of the supply and application of phosphates and of lime (generally speaking, the chief requirements of New Zealand soils) have continued to engage the attention of the agricultural interests. No material developments can be recorded as regards discoveries and working of rock-phosphate deposits in New Zealand, although a higher bonus was offered in this connection. The cutting-off of supplies of basic slag by the war was partly countered by importations of Egyptian basic phosphate on returning troopships. This business was conducted entirely by private enterprise, and a reasonable rate of shipping freight was paid by the importer. The Government, however, arranged with the importing firm for a moderate maximum price for the phosphate on the New Zealand market, this rate comparing favourably with prices recently payable for the same article in other countries.

Considerable activity has been shown in prospecting and opening up deposits of limestone, which fortunately occur in nearly every part of New Zealand. Special attention has been given to soft-limestone deposits, in Canterbury and elsewhere, yielding a supply of carbonate of lime in a state more or less ready for soil-dressing purposes. The use of lime in the carbonate form as distinguished from burnt lime is becoming more general, as the result of a better understanding of the matter by farmers. It is pleasing to note enterprise and self-reliance on the part of the agricultural community in regard to supplies of lime. A company formed among farmers in the Wellington District has recently purchased the deposit and works of the Mauriceville Lime Company, and intends to largely increase the output. In several cases local bodies have taken up the matter of lime-supply for the benefit of their districts. It is found as a rule that Government assistance need not go beyond advice and general guidance. The Department is conducting an effective liming campaign by the dissemination of information, the conducting of demonstration plots, and other means.

It is becoming steadily more recognized that agriculture offers an almost unlimited field for State action in scientific research, education, and practical assistance to the agricultural industry. In New Zealand, although much good work has been done on these lines, those controlling the Department of Agriculture are alive to the fact that little more than the fringe of the manifold problems has been touched. An extension of systematized and co-ordinated investigation work is pressingly required in several directions. Such activities, however, involve a substantial increase in scientifically trained men and funds to maintain the extended staffs. The winning of a lasting peace will, it is trusted, make available before long both the men and the money. Comparatively inexpensive and simple measures, such as the establishment of small demonstration farms at various points—more especially in the South Island—may probably be undertaken without delay, but projects in the nature of a proposed central research station fully equipped and staffed must perforce wait.

In the foregoing report the principal features of the year's agricultural industry in New Zealand have been very briefly reviewed on broad lines. A general account of the work of the Department is furnished in the accompanying report of the Secretary, and further details are supplied by the heads of the several Divisions and Sections. It only remains for me to express my appreciation of the work of the staff of all branches of the Department—work performed in many cases under manifold difficulties, due to war-conditions and other handicaps.

W. D. S. MACDONALD.

REPORT OF THE SECRETARY OF AGRICULTURE, INDUSTRIES, AND COMMERCE FOR
THE YEAR ENDED 31st MARCH, 1916.

Wellington, 26th June, 1916.

The Hon. Ministers of Agriculture and of Industries and Commerce.

I BEG to submit the annual reports of the Department for the year ending 31st March, 1916. In accordance with the desire of the Government I have made my own report as brief as is compatible with a reasonable statement of the Department's operations and prospects, and I have impressed upon my officers the need of doing likewise. The documents referred to comprise the reports of the following officers: (1) The Secretary (director-general of the Department); (2) the Director of the Live-stock Division; (3) the Director of the Fields Division; (4) the Director of the Horticulture Division; (5) the Director of the Dairy Division; (6) the Biologist; and (7) the Chemist.

As usual, my report deals almost entirely with the Department's own operations, it being understood that the more general aspects of agriculture and of the allied industries and commerce will be dealt with in the Ministerial statement.

The year's work has naturally been considerably interfered with by the existing war-conditions, and at times we have been hard put to it to keep the whole of the usual services going smoothly. This has, however, been accomplished, thanks to the special efforts of the staff, who have almost without exception striven their utmost to carry on the duties of those of their comrades who have joined the Expeditionary Forces.

Many of the officers of this Department might with a good deal of justification have arrived at the conclusion that they could serve the Empire as well by remaining at their posts as by enlisting, but nevertheless the Department has every reason to be proud of the number of its members who have gone to the front or into camp with a view to active service. To their present and prospective representatives in the firing-line the remainder of the staff wish all possible good fortune during absence, and a safe return to the great work in which they were formerly engaged. To the relatives of those of our comrades who have laid down their lives for their country and for the principles of right and liberty we extend our deep and respectful sympathy.

The work of the instructional officers has in many respects been hindered by the high prices of implements, fertilizers, fencing-material, &c. The shortage of labour, especially for bush-felling, has also made itself felt. In consequence these officers have at times had to seriously modify the advice they would like to have given to farmers.

Shortage of labour has also affected to some extent the control of the rabbit and noxious-weeds pests, and as the last two seasons have been highly favourable to the increase of rabbits owing to the absence of the usual drowning of the young during heavy rains and floods, there is no doubt that in some districts both rabbits and noxious weeds have made headway, although in other parts some fine work has been done, both pests having been held well in check and noxious weeds having been appreciably reduced in those districts where serious efforts have been put forward by the settlers. It seems necessary to warn settlers that, although the Inspectors will, as in the past, take the circumstances of each case into consideration before drastically enforcing the Rabbit Nuisance or the Noxious Weeds Acts, yet the Department cannot in any circumstances allow these pests to be unnecessarily neglected, and those farmers who may feel disposed to shelter behind the war-conditions must recognize that unless Inspectors are satisfied as to the genuineness in each case of the plea put forward, the Acts must be as fully enforced as is reasonable in each case.

The Inspectors of Stock are now prepared as far as possible to give settlers advice in regard to the production, classing, packing, &c., of wool, also in connection with the dipping of their flocks, and those whose experience in such matters is limited may be strongly advised to consult their local Inspector in regard to such matters.

The Director of the Dairy Division in his annual report writes very strongly on the subject of the quality of some of the milk or cream delivered at the dairy factories and of some of the butter or cheese manufactured. He states that on the whole results in these directions are not as good as formerly; in other words, that the quality of our dairy-produce is as a whole in grave danger of deteriorating. This, I need scarcely point out, is a matter of cardinal importance to the Dominion, and I would therefore ask that the most careful consideration should be given to the remedy suggested by the Director—namely, that the Department should cease to perform the grading of dairy-produce free of charge, but should impose a fee upon the factories sufficient to cover the cost of this service, and that the money thus saved to the Government should be devoted to increasing the staff of officers available for giving instruction to the milk-suppliers in regard to the production and treatment of milk. I regard this as one of the most important matters requiring consideration in connection with the agricultural industries of New Zealand at the present time.

It has been decided by the dairy factories to form a co-operative company to manufacture rennet. This seems to be a very wise move, and it is to be hoped that complete success will attend the effort. To enable this to be attained it is essential that the farmers should supply the required number of calves' vells, and I am confident that the appeal to milk-suppliers, &c., in this connection will not be in vain.

An important development during the year has been the spread of the system of pasteurizing milk for the manufacture of cheese, a process that assists materially in the production of a good and uniform flavoured article. The system can now be confidently recommended.

During the year Mr. J. Brown, B.Sc. Ag., N.D.A., has been appointed Director of the Fields Division, in place of Mr. E. Clifton, who has been acting as New Zealand Commissioner at the San Francisco Exhibition, and who will shortly retire from the Service owing to having reached the regulation age. Mr. Clifton's name will long be held in grateful remembrance by the farmers of New Zealand, especially in connection with the eradication of scab in the early days, the development of the Ruakura Farm of Instruction, and the campaign for the general utilization of lucerne. Mr. Clifton will take with him on his retirement the best wishes of the Department and the farmers for a long and useful autumn of his days.

Mr. Brown, during the short period since he joined the Service, has more than fulfilled the expectations formed as to his suitability as Mr. Clifton's successor, and it is evident that under his able direction the Fields Division is entering upon a new period of useful service. It has been decided upon his recommendation to amalgamate the positions of the Fields Supervisors and the Fields Instructors, the dual position to be known in future as "Fields Supervisor." The Dominion will be divided into nine districts, with a Supervisor in charge of each. Each Supervisor will, under Mr. Brown's directions, superintend the whole of the experimental and instructional work in his district, and will be in close touch with the work at the Department's instructional farms. The Supervisors will also oversee the operations of the Fields Inspectors in regard to rabbits and noxious weeds. In this way it is expected that the farmers will, through the Supervisors and Fields Inspectors, be brought into more direct touch with the Department's experimental and instructional work in connection with field cropping, pastures, &c.

The number of learners at the instructional farms has been slightly increased, but it is obvious that no considerable number can be accommodated at the few institutions available, and that other means will have to be found for providing instruction for lads who wish to become expert in the ordinary farming operations. It is felt that better use would be made of the few positions that can be made available at the Department's own farms by reserving them for well-educated lads whose intention is to later on enter the service of the Department as Instructors.

A very gratifying feature of the year's operations has been the continued success of the Department's campaign for the general use of lucerne. There are in many parts of the Dominion fair-sized fields of this invaluable plant, and in most instances the growing of this crop has originated in a co-operative experimental acre. It is now beyond all doubt that in most parts of the Dominion lucerne is a conspicuous success, provided the necessary trouble is taken in preparing the fields and nursing the crop in the early stages. I earnestly counsel those farmers who have not yet put this matter to the test to lose no time in communicating with the Fields Supervisor of their district.

It is noticeable that a large quantity of comparatively low-grade hemp (phormium) is being produced. It is customary to attribute some blame to the millers in regard to this, and no doubt there is much to be said in favour of at all times maintaining their output of the highest possible quality. It must, however, be recognized that millers cannot be expected to produce any grade but the one that pays them best in their individual circumstances. I hope that the relative prices of the higher grades will soon return to a level that will induce millers to do their very best work. In this connection the Department's investigation of the pests that are deteriorating the phormium-leaves should be of great assistance to millers if it results in the discovery of a practicable remedy. The preliminary work of the investigation is now completed, and definite experiments are about to commence. In addition some work in connection with the cultivation of phormium-plants will shortly be initiated at Weraroa Experimental Farm.

It is hoped that proposed regulations in regard to the compulsory grading—*i.e.*, classification of lines—of fruit for export will be in operation next session, but the general establishment of central packing-sheds would greatly facilitate the making of the regulations on workable lines. I commend this matter earnestly to the fruitgrowers' associations. The loans now obtainable from the Government under the Fruit-preserving Industry Act are being taken advantage of to some extent, but I trust that more applications for help in this direction will be forthcoming in the near future. The export of fruit for last season was checked by the lack of sufficient shipping, but this may yet prove a blessing in disguise by demonstrating to the fruitgrowers the need of local cool stores, and by emphasizing the fact that there is an enormous local market for fruit of good quality, well graded, and stored to avoid the seasonable glut.

The new regulations for the compulsory Government grading of honey for export will, I am sure, soon establish confidence in our honey on the London market. Its reputation there is already high, and when Home buyers find that they can rely on the Government grade-notes in the same way as those for other products marketing will be greatly facilitated. Taking into account the splendid climate, the protection afforded by our excellent Apiaries Act, the advantages available in the way of Government instruction, and the benefits that will flow from the new grading-system, New Zealand bids fair to become a great honey-producing country before many years are past.

It has again been made abundantly manifest that there is room for a very large development of the poultry industry in the Dominion in the production of both eggs and table poultry. There is every reason why a great many of our farms should produce large quantities of these excellent foods, and I am hopeful that the appointment of two additional Instructors (making a total of three) will ere long result in the market being much more adequately supplied at reasonable prices. If farmers are started in the business on proper lines as the result of the work of these Instructors, it should soon become a matter of impossibility for the inhabitants of New Zealand to be practically unable to obtain the eggs and poultry they need.

The question of book-keeping by farmers has received more attention lately owing to the difficulties experienced in giving the information required by the Commissioner of Taxes, and I am still of opinion that it would be a good thing if the Department undertook the work of opening suitable books for farmers and balancing them annually. With such assistance a large number of settlers could without any special training keep satisfactory books. In previous annual reports I have expressed my willingness to recommend the undertaking of such work by the Department if a sufficient number of farmers notified me of their desire for such help. Branches of the Farmers' Union and similar bodies might well take this matter into consideration.

A good deal of work was thrown on the Department in connection with the free railage of live-stock and fodder to relieve drought-stricken settlers in the North Otago and South Canterbury districts. The railage charges are being borne by this Department, which is thus helping a number of struggling settlers out of an acute difficulty. It is a matter for regret that some well-to-do farmers seem unable to recognize the reasonableness of the Department in granting assistance to those whose financial position warrants it, and at the same time refusing similar concessions to people who are quite well off, and to whom the difficulty is merely temporary.

The splendid displays made by the Department at a number of agricultural and pastoral associations' shows have met with even more appreciation than in previous years, but there are some who express doubt as to whether the considerable cost of these displays is warranted. To these I would point out that in many countries such associations are largely subsidized by the Governments, while nothing of the kind is done in New Zealand, and that, although undoubtedly a number of people merely regard our displays from the sightseers' point of view, a very great number of farmers study them carefully and derive direct benefit from them; in addition an enormous amount of indirect good is done by setting the farmers thinking and planning to improve their farms. These displays also act as centres at which settlers may, and do, meet our instructional officers and make arrangements for subsequent visits. Personally I am convinced that the displays should be continued to a reasonable extent.

I should like to take the opportunity of thanking those officers who, without any pressure from the Department and purely with a desire to help the agricultural industries, devote a lot of time—largely their own spare time—to the work of contributing to the *Journal of Agriculture*. Their work is of the highest importance in promoting good farming, and to my knowledge is intensely appreciated by thousands of readers of the *Journal*.

That a large measure of successful achievement has resulted from the year's operations of the Department is evident from the appended brief summary of the reports of the officers (in so far as those documents come within the scope of this present report).

The Dominion's enviable and probably unique position in regard to freedom from serious diseases of live-stock has been fully maintained, the surest proof of the good work of the officers concerned. The percentage of tuberculosis in cattle and pigs has not shown this year the progressive decrease recorded in recent years, but the percentage is nevertheless very low in comparison with other countries. The investigation of the obscure disease known as bush sickness has reached a stage where the prospects of controlling the trouble by practicable means are distinctly good.

The question of whether the very heavy slaughterings induced by war prices have made too great inroads upon breeding-stock needs careful consideration, and in this connection the pastoral statistics now being compiled are somewhat anxiously awaited.

The inspection of live-stock, of small slaughterhouses, and of dairies supplying household milk has been effectively maintained notwithstanding the difficulties arising out of the war. The prevention of the introduction of disease by imported live-stock, &c., has been continued by means of the port inspection and quarantine services. In this connection new regulations have been made and are working smoothly. The control of the sterilization of animal-manures for shipment to New Zealand has been in operation in Australia and India as usual. The examination of meat at public abattoirs and meat-export slaughterhouses has also been rigorously maintained, and every carcass unfit for human consumption has been diverted to the manure-works. The number of meat-export slaughterhouses is increasing rapidly. A great deal of extra work has fallen on the meat-inspection staff and the officers controlling them in connection with the supply of meat to the Imperial Government for war and other purposes. This work has been done both well and cheerfully.

The poultry industry has had to contend against the high prices of grain during the year, but has weathered the storm successfully, and will probably be all the better for the heavy culling of birds that was inevitable. There is plenty of room for the expansion of poultry-keeping amongst farmers, but in most cases it is advisable that more advantage should be taken of the aid of the Poultry Instructors to ensure working on profitable lines. The effect of the distribution of eggs and breeding-stock at cheap rates from the Department's poultry-stations at Ruakura and Milton is now very evident in the better class of laying-hens now being kept throughout the Dominion, but an improvement in the preparation of table poultry for market is a consummation devoutly to be wished. The three Poultry Instructors have had a very busy year giving lectures, demonstrations, and written and verbal advice to present and prospective poultry-keepers.

During the year a considerable development took place in the work of advising settlers in regard to the farming of arable land, and it is recorded that as a result of such advice, given during the year or previously, a distinct advance in that class of farming is observable in many parts of the Dominion. In this instructional work the Divisional Director has been assisted by the Agriculturist, the Fields Instructors and Fields Inspectors, and the Managers and staffs of the experimental farms at Ruakura, Mounahaki, and Weraroa. Good service in the same direction has also been done by the departmental displays at certain agricultural and pastoral shows.

At Ruakura the usual work with field-crops, dairy herd, sheep, pigs, poultry, and bees was carried on with much success, notable features being the raising of red-clover and mangel seeds; fine crops of wheat, rye, Scotch tares, and rape; and good sales of Darbalara milking Shorthorn bulls, Southdown rams, and Berkshire pigs. At Mounahaki also the ordinary operations were undertaken with favourable results, points calling for special notice being the success of the Ayrshire herd, the Ryeland and Border Leicester flocks, and Berkshire pigs; the fine crops of mangels, lucerne, potatoes, carrots, and tomatoes; and the plant-breeding work. At Weraroa the chief matters for comment are the continued success of the Holstein and milking Shorthorn herds, and the initiation of an important scheme of experiments with fodder crops and grasses. At the new Ashburton agricultural station preparatory work is in progress.

A large number of field-crop experiments have been carried out by farmers or schools in conjunction with the Department, and much interest in farming problems has been aroused thereby.

Work has been carried on in connection with the farming of certain special areas of intractable land, such as the North Auckland gum areas, the pumice lands of the Taupo Plateau, the manuka area between the Eyre and Waimakariri Rivers, the pakihi lands of the Westland District, the Mackenzie and Otago Central plains, and the mossbanks of the Owaka district. A start has been made with work having for its object the reclamation of drifting sands.

The registration of the brands and analyses of fertilizers has been continued, and occasional samples have been taken to ensure that vendors maintain the registered standards.

The control of rabbits and noxious weeds has been rendered unusually difficult by a number of factors, such as the absence of the heavy rains which usually check the rearing of rabbits, the high prices and scarcity of carbon disulphide, the scarcity of labour, and the enlistment of a number of the Department's officers in the Expeditionary Forces. Special exertions will therefore be necessary to prevent these pests increasing their hold. Nevertheless much good work in this way has been done during the year, and several of the officers are entitled to great credit for their part in bringing this about.

The grading of hemp (phormium) has been continued, the quantity dealt with showing a large increase for the year. The high prices for the lower grades, and the prevalence of pests in one of the chief hemp districts, has resulted in the production of a large amount of fibre of comparatively low quality.

The continued substantial increase in the area of commercial orchards in the Dominion and the favourable season for certain pests has kept the work of the orchard instruction service at high pressure, and a great deal has been accomplished by personal visits, public addresses and demonstrations, and correspondence, towards the advancement of the industry. This is evidenced by the general adoption of better methods in the orchard and packing-shed and the consequent improvement of the fruit received for local sale or export.

As the work of three of the Department's experimental farms—Tauranga, Te Kauwhata (formerly called "Waerenga" or "Wairangi"), and Arataki—was mainly in connection with horticulture, the control of these properties was transferred during the year from the Fields Division to the Horticulture Division, and they will in future be known as horticultural stations. At Tauranga the operations were interfered with by the ill health and subsequent retirement of the Manager, Mr. W. C. Berridge, after being honourably connected with the institution since its inception. The main work at Te Kauwhata was in regard to the preparation of fruit-farms for subsequent occupation by settlers. In addition the usual operations were carried on, including the stripping and sale of a quantity of wattle-bark, and the growing of a considerable area of grapes, from which sound wines were produced. The sales of these wines are increasing satisfactorily. A plant for the making of unfermented wine on modern lines has lately been installed. The Arataki Horticultural Station is being greatly improved, as indicated by the exhibits contributed to the Department's displays at several of the agricultural and pastoral shows. In a few years this station will, it is hoped, be of high value to the horticulturists of Hawke's Bay.

There are now in the Dominion over sixty fruit-testing plots worked by growers in co-operation with the Department. These are beginning to yield a large amount of information regarding the varieties of fruit best suited for growing in their localities. They also provide suitable places for the Orchard Instructors' demonstrations of approved methods.

The grading—*i.e.*, classification of lines—of export fruit by departmental officers was continued on an optional basis, but lack of shipping facilities prevented an extension of the quantity sent out of the Dominion.

The supervision of the work of controlling orchard pests was actively continued, and owing to dry weather much spraying was needed to keep certain diseases in check, although the same causes assisted in combating fungus troubles.

To prevent the introduction of disease the inspection of all fruit, plants, &c., imported into New Zealand has been systematically and successfully carried out at the ports of entry.

The inspection of vineyards and vinehouses has been continued, and instruction in wine-making has been provided where required. The table-grape production of the Dominion is now estimated to be worth over £25,000 per annum.

Beekeeping is steadily improving its position as one of the Dominion's established industries, and the four Apiary Instructors had more work than they could contend with in meeting the requirements in regard to inspection, instruction, and export grading. Their efforts are, however, resulting in better work by many beekeepers, and the output has been greatly improved in quality. Some experimental work for the guidance of those engaged in the industry is being initiated at the apiary at the Ruakura Farm of Instruction. The new regulations for the compulsory Government grading of honey for export are working smoothly.

The ordinary work carried out by the Dairy Division with great efficiency has included the grading of all dairy-produce intended for export; the check-weighing and moisture-testing of a large portion of the export produce; the inspection of dairy factories and, where required, the instruction of those working them; the inspection, as far as the limited number of officers would allow, of the premises of farmers supplying inferior milk to the factories; assistance to those contemplating the formation of co-operative dairy companies; advice to those building or altering factory premises or equipment; check-testing of milk or cream for factory-managers or suppliers; instruction in the making of fancy cheeses; supervision of herd-testing; and semi-official testing of purebred cows.

Special duties have comprised work in connection with the large purchase of cheese for the military requirements of the Imperial Government, and the buying of butter and cheese for the camps and transports of the New Zealand Expeditionary Forces. The officers of the Dairy Division who have so willingly carried out this work are deserving of special thanks.

A large number of additional cheese-factories were registered during the year, many of them being in new localities.

A difficulty having arisen regarding the interference of the war-conditions with the future supply of rennet for cheesemaking, much information was obtained from the High Commissioner and the Dairy-produce Inspector on his staff, and has been submitted to those interested.

Much good work has been done by the Dairy Instructors by assisting in extending to a further number of factories the system of pasteurizing milk for cheesemaking. A great improvement in the flavour of the product should result.

The Department has now found it advisable to require that all butter made from whey cream shall be branded with the words "whey butter."

The prospects of the export of casein being favourable, one of the Dairy Instructors has carried out some successful experiments in the extraction of casein from buttermilk.

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