PROVINCE OF BRITISH COLUMBIA

TWELFTH ANNUAL REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR THE YEAR 1917

PRINTED BY
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VICTORIA, B.C.:
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1918.

To His Honour FRANK STILLMAN BARNARD,

Lieutenant-Governor of the Province of British Columbia.

MAY IT PLEASE YOUR HONOUR:

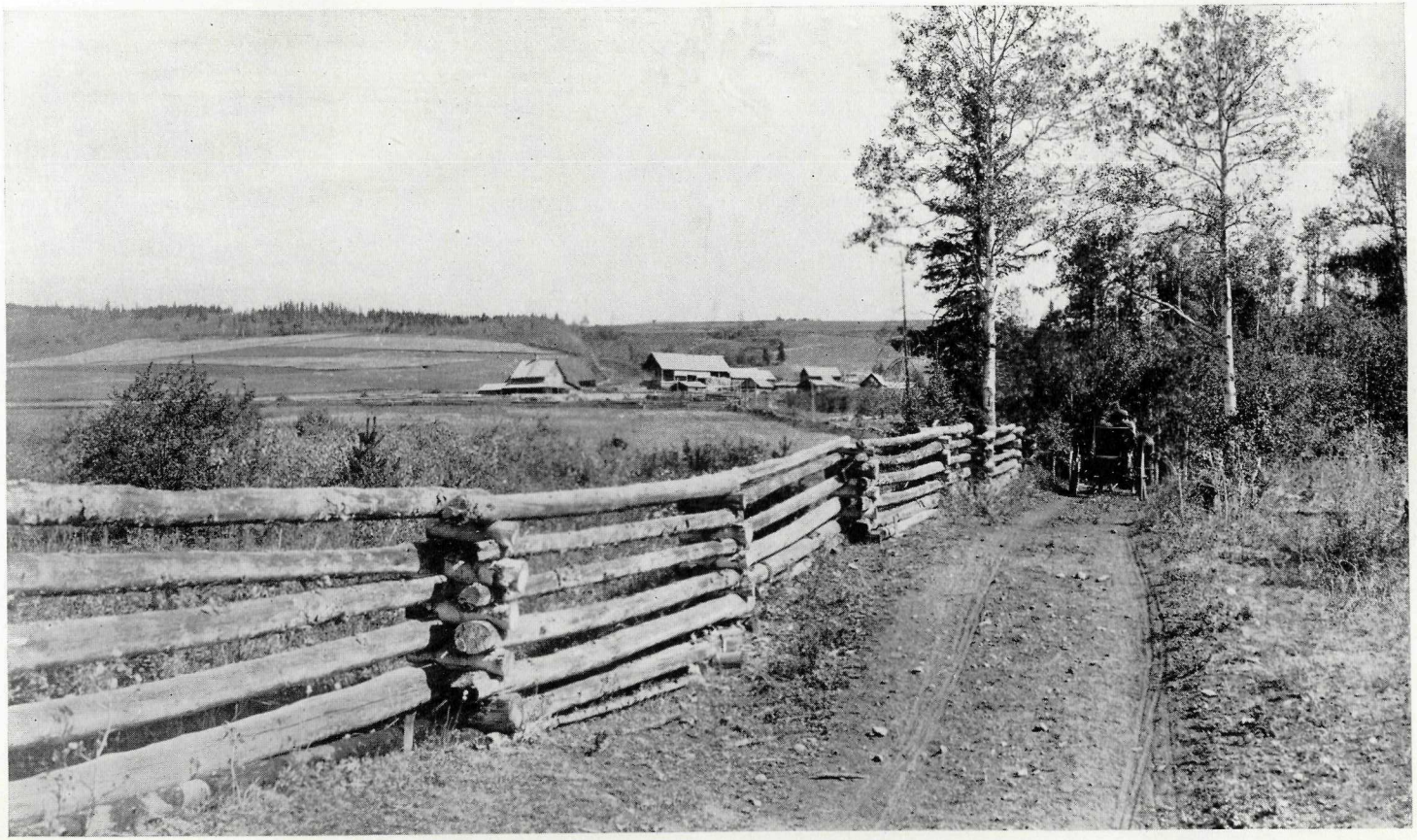
I have the honour to submit for your consideration herewith the Annual Report of the Department of Agriculture for the year 1917.

JOHN OLIVER,

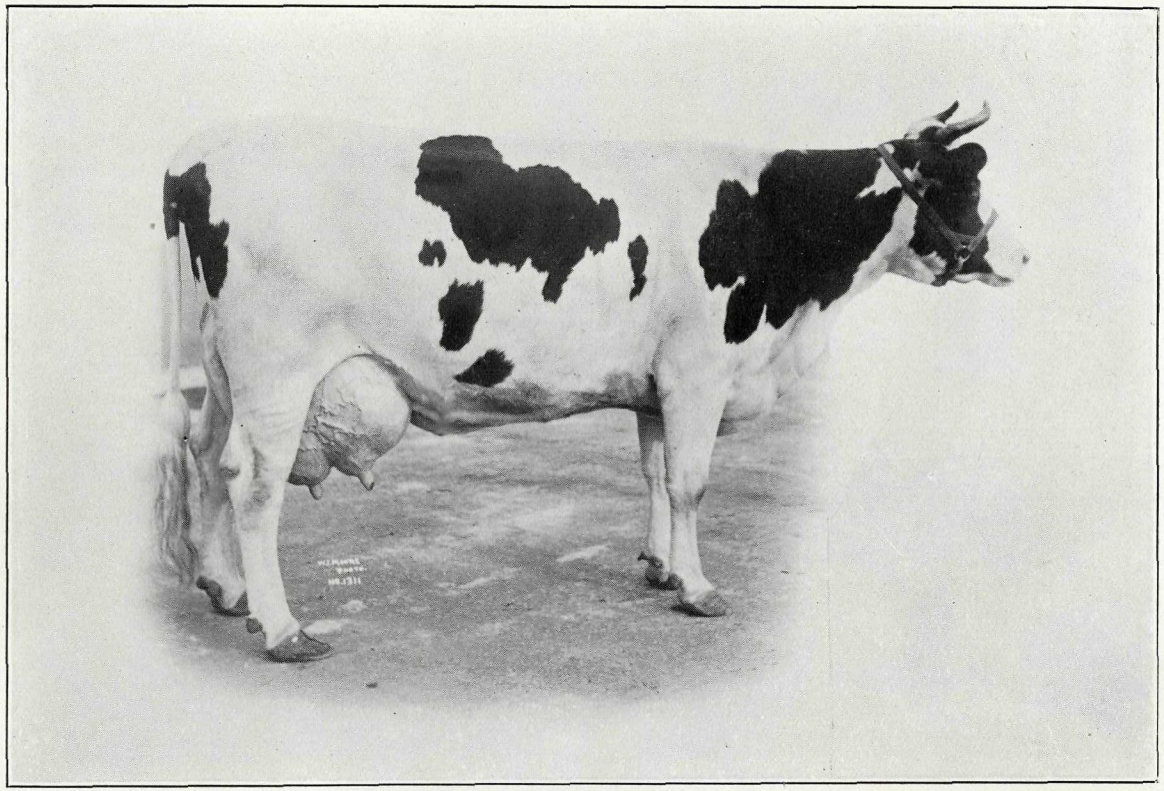
Minister of Agriculture.

Department of Agriculture,

Victoria, B.C., February 7th, 1918.



Homestead in the Bulkley Valley.



"Madame Posch Pauline," No. 10291, owned by Colony Farm Essondale. Official record, 365 days: Milk, 27,597.4 lb.; butter-fat, 898.77 lb.; butter, 1,123.53 lb.

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BRITISH COLUMBIA DEPARTMENT OF AGRICULTURE.

BRANCHES AND CHIEF STAFF MEMBERS, YEAR 1917.

Minister of Agriculture:

Hon. JOHN OLIVER.

Deputy Minister:

WM. E. SCOTT.

Secretary:

WM. J. BONAVIA.

Statistician:

A. B. TWEDDLE.

Secretary to Minister:

E. J. ROSSITER.

Horticultural Branch:

R. M. WINSLOW, B.S.A., Provincial Horticulturist and Inspector of Fruit Pests.
M. S. MIDDLETON, B.S.A., Assistant Horticulturist and Inspector of Fruit Pests to July 7th, and Provincial Horticulturist and Inspector of Fruit Pests from July 7th to December 31st.
B. HOY, B.S.A., Assistant Horticulturist and Inspector of Fruit Pests.
H. THORNBER, B.S., Assistant Horticulturist and Inspector of Fruit Pests.
E. W. WHITE, B.S.A., Assistant Horticulturist and Inspector of Fruit Pests.
P. E. FRENCH, B.S.A., Assistant Horticulturist and Inspector of Fruit Pests.
E. C. HUNT, B.S., Acting Assistant Horticulturist and Inspector of Fruit Pests.
W. H. ROBERTSON, B.S.A., Assistant Horticulturist and Inspector of Fruit Pests (on active service).
M. H. CHESBRO, B.S., Assistant District Fruit Pest Inspector.
W. T. HUNTER, B.S.A., Assistant District Fruit Pest Inspector.
J. TAIT, Assistant District Fruit Pest Inspector.
H. H. EVANS, Assistant District Fruit Pest Inspector.
C. R. BARLOW, District Fruit Inspector.
H. GUTTERIDGE, Assistant Potato Inspector and Investigator of Potato-diseases.
R. C. ABBOTT, Coast Markets Commissioner and Inspector in Charge of Exports.
W. E. MCTAGGART, Prairie Markets Commissioner.
J. A. GRANT, Prairie Fruit Markets Commissioner, succeeding W. E. McTaggart.
J. L. HILBORN, in charge, Fruit and Vegetable Experimental Station, Summerland.
S. LEC. GRANT, Caretaker, Demonstration Plot, Bella Coola.
H. T. THOMPSON, District Fruit Pest Inspector.
E. W. BUCKELL, Inspector on Codling-moth.
J. R. CHEESMAN, Inspector on Codling-moth.

Imported Fruit Inspection Branch:

W. H. LYNE, Inspector of Imported Fruit and Nursery Stock, Rice, etc.
D. GAVET, Assistant Inspector of Imported Fruit and Nursery Stock, Rice, etc.
W. J. GRAHAM, Assistant Inspector of Imported Fruit and Nursery Stock, Rice, etc.
H. F. OLDS, Assistant Inspector of Imported Fruit, Vegetables, Rice, etc.

Plant Pathology and Entomology Branch:

J. W. EASTHAM, B.Sc., Plant Pathologist.
M. H. RUHMANN, Assistant Plant Pathologist.

Live Stock Branch:

W. T. MCDONALD, M.S.A., Live Stock Commissioner.
S. H. HOPKINS, B.S.A., Assistant Live Stock Commissioner.
H. RIVE, B.S.A., Dairy Instructor and Inspector (on active service).
T. A. F. WIANCKO, Dairy Instructor and Inspector.
J. R. TERRY, Instructor in Poultry-raising.
H. E. UPTON, Assistant Instructor in Poultry-raising.
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E. W. HOGAN, B.S.A., Soil and Crop Instructor.
W. NEWTON, Soil and Crop Instructor (on active service).
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G. C. HAY, B.S.A., Agriculturist.
J. H. MCCULLOCH, B.S.A., Agriculturist.
S. F. DUNLOP, B.S.A., Agriculturist (on active service).
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Dr. S. A. K. WHITE, V.S., Assistant Veterinary Inspector.
Dr. W. W. ALTON, V.S., Assistant Veterinary Inspector.
Dr. B. R. ILSLEY, V.S., Assistant Veterinary Inspector.
E. RIVE, Official Milk-tester.
G. H. THORNBERY, Cow-tester.
J. B. WATSON, Official Milk-tester.
R. J. FERRIS, Silo Demonstrator.
W. H. STROYAN, Poultry Caretaker.

Foul-brood Inspectors:

F. D. TODD, Victoria.
W. J. SHEPHARD, Nelson.
L. HARRIS, Vernon.

Women's Institutes:

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Mrs. J. S. CHALMERS, Lecturer.

Clerical:

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G. L. FOULKES (on active service).
C. P. L. PEARSON.
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M. M. PATCHETT.
P. WARREN.
A. E. HILL.

General:

A. H. SHOTBOLT, General Assistant.
D. E. MACKERETH, Carpenter.

Publications Branch:

J. R. MCLENNAN, Editor.
M. A. STUART, Agriculturist and Acting-Editor.

REPORT OF THE DEPARTMENT OF AGRICULTURE.

REPORT OF THE DEPUTY MINISTER OF AGRICULTURE.

WM. E. SCOTT.

Hon. John Oliver,
Minister of Agriculture, Victoria, B.C.

SIR,—I have the honour to submit herewith my report on agricultural conditions and the work of the Department of Agriculture for the year 1917.

PRODUCTION.

The total value of agricultural production for the past year shows an increase in value in excess of $3,000,000 over 1916. This is due to the high prices which have prevailed for practically all lines of farm produce. Actual production, however, shows a slight decrease, due to the acute labour shortage which exists and to the unfavourable climatic conditions which prevailed in many of the farming sections of the Province, and which materially curtailed production.

CROP CONDITIONS.

The year 1917 was an unfavourable one for our agriculturists in most parts of the Province. On Vancouver Island and the Lower Mainland the spring was cold and backward, with persistent wet weather at seeding-time, which delayed unduly the seeding of low-lying lands. The summer months were exceptionally dry and crops on light soils consequently suffered. In the Southern Interior districts an exceptionally hot, dry summer seriously affected crops, especially in those parts in which irrigation is not practised. In the dry-farming areas especially, crops were very light and in some cases a total failure. In the cattle-raising districts of the Thompson and Nicola Valleys, Cariboo, Lillooet, and Chilcotin, whilst field crops were below normal, range lands were in good condition and cattle and sheep did well. In the farming districts between Prince Rupert and Tete Jaune Cache, adjacent to the line of the Grand Trunk Pacific Railway, the season was on the whole a favourable one. Hay and grain crops yielded well and were of excellent quality. Summer frosts occurred in places and did some damage to crops, more especially root-crops. In the Pouce Coupe and Fort St. John districts of the Peace River country good crops were secured. A considerable settlement of these districts has taken place during the past few years and crop production has consequently been largely increased. A very considerable amount of grain is now grown.

FARM CROPS.

Wheat.—The wheat-crop of the Province shows a lighter yield per acre, due to an unfavourable season in many districts, but there was a considerable increase in the acreage sown to this crop. This increase is particularly noticeable in the Peace River District, in dry-farming areas, Cariboo, Lillooet, Thompson, Nicola, and Okanagan. The crop was of good quality and on the whole harvested in excellent condition. The growing of winter wheat should be practised more extensively by farmers in many of our districts, especially on Vancouver Island and the Lower Mainland, on high-lying lands. It has been clearly demonstrated that winter wheat will give better yields than spring wheat on lands of this description.

Oats.—This is our principal grain-crop. The yield was below the average. Late crops on Vancouver Island and the Lower Mainland suffered from wet weather in the month of September. Excellent crops were grown in Central British Columbia and the Peace River country. Production shows a slight decrease as compared with the previous year.

Barley.—This crop is not grown to the extent it should be. Good crops are secured in practically all parts of the Province, and, considering its value as a stock-food, it should be grown more extensively by farmers who keep stock, especially hogs.

Peas.—The extremely high price of seed-peas has prevented any extensive seeding of this crop by farmers. Peas and oats are generally grown, cut green, and used either as a roughage or for ensilage purposes. It is a favourite crop with dairymen, who find it very suitable for milk production.

Hay.—The hay-crop was a fair one and generally harvested in good condition. There is a decrease in the quantity of natural meadow and clover and timothy hay grown in the Province, due principally to the fact that the high cost of grain has resulted in farmers ploughing up some of their hay lands and seeding to grain.

Alfalfa.—The acreage devoted to growing this valuable fodder-crop is rapidly increasing, especially in the irrigated districts of Southern British Columbia, where three cuttings of this nutritious grass are generally made, with a yield in many cases ranging from 5 to 8 tons per acre. Good results are being obtained by many of our farmers in pasturing hogs on alfalfa, and it is also, of course, of great value for ensilage purposes.

Corn.—The year was an unfavourable one for corn, the yield being generally light. The acreage devoted to the growing of fodder corn is increasing very rapidly, principally owing to the extensive use of silos, which are now being built over practically all our farming districts.

Potatoes.—There was a considerable increase in the acreage planted to this crop, but the yield was lighter, being approximately 95 per cent. of a normal crop. Tubers were small, and consequently the amount available for commercial use was materially reduced. There was also a considerable amount of disease in the potato-crop. Farmers should be more careful in the selection of seed, and in all instances should treat their seed before planting it.

Roots.—The acreage devoted to roots showed a material decrease, due principally to the acute farm-labour shortage. The crop was considerably below normal.

Other Vegetables.—These were generally a fair crop, but light in some districts owing to unfavourable weather conditions.

Tree-fruits. The crop of tree-fruits was light but of good quality in the Coast districts. In the important fruit-growing centres of the Interior the crop was on the whole a good one. The fruit was of excellent quality and very free from disease. There was an increase of approximately 15 per cent. over 1916 in the Okanagan Valley. In the Boundary, Kettle Valley, and Kootenay Districts the crop was a light one, the fruit being clean, but small in size.

Small Fruits.—The strawberry-crop on Vancouver Island was a light one, but the berries were of excellent quality and the crop was successfully harvested and marketed. The picking season, owing to the hot, dry weather which prevailed at picking-time, was of exceptionally short duration, with a resultant curtailment of the crop. Raspberries also were a light crop, but on the whole gave satisfactory returns to the growers. Some damage was done by wet weather at the picking season.

LIVE STOCK.

Dairying.—The dairying industry has suffered owing to the labour shortage, which has caused many dairymen with limited means to sell off or curtail their herds.

Beef Cattle.—The year was a successful one for beef cattle, the ranges of the Interior affording good pasturage.

Hogs.—The high prices prevailing as a result of the world shortage of hogs have encouraged farmers to keep more of this stock, and the patriotic appeal to farmers for increased hog production has met with a ready response from them, and we may anticipate a large increase in hog production during the present year.

Sheep.—The high prices of mutton and wool have given a decided stimulus to the sheep industry. In many of the Interior districts of Southern British Columbia there are considerable flocks of sheep which are proving very remunerative to their fortunate owners. The "Sheep Protection Act," passed at the last session of the Provincial Legislature, provides means whereby owners of sheep are protected from the ravages of dogs. The south-eastern part of Vancouver Island, with the adjacent Gulf Islands, has been proclaimed a sheep district under the Act, and beneficial results are apparent. There is a great scarcity of breeding ewes, and this, added to the very high price, makes it difficult for those who wish to start in the sheep-raising industry to make a beginning. There are many suitable areas for sheep-raising in the Province, and we may look forward to a rapid development in the near future of this phase of the live-stock industry.

Poultry.—The excessive cost of poultry-feeds has militated against the development of the poultry industry. Farmers who are in a position to raise on their farms the necessary poultry-feeds are making good profits with the high prices that have prevailed for poultry products, but the poultryman on the small holding who has to purchase all his poultry-feed finds it difficult to make a satisfactory profit, and many of these poultrymen have consequently gone out of the business.

Goats.—Many people in the Province are giving attention to the keeping of goats, which are of great service to small land-owners who are unable to keep a cow. Goats are also very useful for land-clearing purposes, and there are many parts of our Province where these could be ranged in large numbers; and with the very high prices prevailing for mohair, there should be good returns to be made out of goat-raising in suitable localities. A Goat-breeders' Association has been formed and has now a considerable membership. Importations of pure-bred goats have been made into the Province, and it is likely that in the near future this industry will become firmly established in certain parts of the Province.

LAND-SETTLEMENT.

As a result of the great world war, immigration to our Province has materially declined. A considerable settlement has, however, taken place recently in the Dominion Peace River Block, more particularly in the Pouce Coupe and Fort St. John Districts; the completion of the Dunvegan-British Columbia Railway to Spirit River, which is distant about seventy miles from Pouce Coupe, has facilitated ingress to this fine agricultural district. At the present time all business from the Peace River country goes to the Province of Alberta, and will, of course, remain so until an outlet has been afforded to our Coast cities by the completion of railway transportation. What settlement is taking place is practically all from the United States and the neighbouring Provinces of Alberta, Saskatchewan, and Manitoba. The scarcity of labour and the high cost of stumping-powder have also proved detrimental factors to the settlement of our vacant lands.

LABOUR.

British Columbia, in common with all other countries, is suffering from an acute labour shortage, and this especially applies to farm labour. When we consider that not less than 40,000,000 producers from the soil are either fighting or engaged in other lines of war-work, it is not to be wondered at that labour should be scarce. Whilst our farmers by dint of hard work and strenuous effort have kept production nearly up to the level of the previous year, unless some solution to the labour problem can be found immediately our production must show a further falling-off in 1918. Efforts have been made towards the mobilization of our home supply of labour, and by a proper and effective organization of our women and boys from public and high schools the situation can no doubt be materially improved and alleviated. We see what the women of Great Britain and France are doing on the farms, and the time has come when women of Canada must also come to the rescue and help in our fields and orchards, so that we may not only maintain our production, but increase it. Food is now the vital factor in the war, and America and Canada are being called upon to supply large quantities, so that our fighting forces and those of our Allies and the civilian population may be sufficiently fed. Throughout the Dominion strenuous efforts are being made to solve the labour problem and to produce the foodstuffs so vitally needed.

INCREASED HOG PRODUCTION.

Bacon is the fighting food and must be supplied to the fighting forces in sufficient quantities. A campaign for increased hog production is being vigorously prosecuted throughout the Dominion and good results are expected. An energetic publicity campaign is being carried out by our Department, and we have thoroughly competent men in the field who are holding publicity meetings for farmers, visiting them on their farms, in order to discuss ways and means, and generally to advise how they may keep more hogs and raise them economically and profitably.

FOOD-CONSERVATION.

A Dominion-wide appeal has been made directed towards the conservation of beef, bacon, and wheat-flour, the exportable products needed by the Entente nations. The public of Canada are being asked to conserve these foods by voluntary saving, by using perishable products in

their place, and by eliminating all waste. Already a good response has been made by the people of British Columbia. "Increased production, conservation of exportable products, and the elimination of waste" is the slogan for 1918, and all departmental officials are featuring this in their work amongst farmers.

ACTIVITIES OF DEPARTMENT OF AGRICULTURE.

Owing to the depletion of the staff of agricultural experts and the curtailment of Provincial appropriations, the educational activities of the Department have of necessity been somewhat reduced, but every effort has been made to maintain our chief lines of work in a state of efficiency.

LIVE STOCK BRANCH.

The work of the Live Stock Branch has been actively maintained under the direction of Live Stock Commissioner W. T. McDonald.

Veterinary Inspection.—An active campaign was undertaken by the Veterinary Inspection Division towards the control and eradication of bovine tuberculosis amongst our dairy herds, and with very satisfactory results. There were 15,398 dairy cows tested during the year. Out of this number there were 579 reactors, or a percentage of 3.8. The result of the aggressive work of previous years directed towards the control of this insidious disease—which is not only a serious menace to the public health, but is also a cause of great economic loss to dairymen—is plainly evidenced by the substantial decrease in the percentage of reactors to the test, and is also shown by the lessened degree of infection. A vigorous continuation of the work will undoubtedly result in the practical elimination of this disease from our dairy herds.

Demonstration Plots.—Work on the various demonstration plots which has been carried on for the last few years was discontinued at the end of the year, as it was considered that the object for which these plots were originally established had been practically accomplished. It was also thought that the money used on this work might now be more profitably employed in other lines of work. Valuable data and information have been secured by the Department, which will later be published in bulletin form for the information and guidance of farmers. There were eight of these demonstration stations operated under the supervision of the Soils and Crop Division during 1917, being located at Armstrong, Chilliwack, Edgewood, Errington, Pitt Meadows, Grand Forks, Rock Creek, and Rose Hill. Work on the demonstration plot at Pitt Meadows will be continued during the present year.

Cow-testing Associations.—The work of the Cow-testing Associations at Chilliwack, Langley, Surrey, Delta, and Comox continues to hold the interest of farmers in this important phase of their dairy operations. Results obtained by keeping careful records of weights and tests of each cow's milk, together with the approximate cost of her feed, have been most useful, in that the farmer has been able to intelligently weed out his poor cows and save for breeding purposes the progeny of his profitable cows. There is no doubt that these associations have been the means of starting some of our progressive owners of high-producing dairy cows on the way to permanent success, and have by example assisted to a great extent many other dairymen. This work could be largely increased and extended if suitably trained men were available as Supervisors. Great difficulty has been experienced in securing efficient testers, owing to enlistments and the general scarcity of help and the high prices being paid for ordinary labour.

Crop Competitions.—Many competitions in the growing of various field crops were carried out during the year under the auspices of Farmers' Institutes, and on the whole they were very successful, and keen rivalry was shown by competitors in their work. By encouraging a spirit of friendly rivalry between farmers in this manner, undoubtedly better farming methods are engendered. The value of the work is plainly evidenced by the better farming methods which are now practised in the districts in which these competitions have been held for a number of years, and in the heavier crops which are now produced. Eighty competitions were carried out, with a total entry-list of 718 plots. The crops grown in these competitions were potatoes, oats, grain-hay, wheat, mangels, carrots, corn, clover, alfalfa, turnips, and kale. It is anticipated that there will be a large increase in this important educative work during 1918, and plans are now being made to carry out the work to the best advantage.

Boys' and Girls' Clubs.—Boys' and Girls' Clubs have proven a very important line of agricultural extension work, and the results have been very gratifying. During the year 1917

there were thirty clubs and forty competitions held. Plans are being made to emphasize the pig-raising competitions during the year 1918. It is hoped that a closer supervision of the work of the boys and girls may be feasible in future.

Co-operative Variety Testing.—Good educative work has been carried out among our farmers by means of supplying selected seed of various kinds to farmers in different districts in order to try out their merits. The scarcity of reliable information as to varieties of mixed-farming crops suited to soil and climatic conditions in different districts has resulted in each farmer growing those varieties which he considered best. By the distributon of samples of first-class seeds of the more important field crops to farmers more uniformity in crop production has been ensured, and this very important work will be further extended during the present year.

Drainage Experimental Work.—The need for underdrainage in certain parts of our unirrigated districts has become more evident each year. In order to find out how this matter may best be handled, the Department secured a Cyclone ditcher and offered to loan this machine, together with the services of a drainage expert, to the farmers free of charge. Unfortunately, through some delay, the machine was late in being delivered, and we were therefore not able to carry out as much experimental work as we had intended. Seven farmers, however, availed themselves of this offer during 1917. The official in charge of this work visited various farms wherever fields needed drainage and advised the various owners as to how they might best handle the situation. It is anticipated that this experimental work will result in showing farmers how they can reduce the labour incidental to work of this nature.

Pitt Meadows Demonstration Station.—The site for this station was chosen in 1916, being located on the farm of F. V. Harris. Work was commenced in the autumn of 1916, when the land was ploughed deeply and a system of tile draining installed. The demonstration-work was commenced in 1917. Valuable data have been secured as a consequence of the operations on this plot as to the best methods of soil-treatment on peat lands. Whilst some very striking results were obtained, it will be necessary to continue the work for several years before the Department will be in a position to make any definite recommendations as to how the soils of the Pitt Meadows may best be handled and the highest crop production secured. The investigational and experimental work being carried out on this plot should prove of inestimable value to farmers in the Pitt Meadows District and other places where they have similar soil conditions.

Dry-farming Experimental Stations.—The Department of Agriculture took over the management of the dry-farming stations at Quilchena and 105-Mile House at the beginning of April, 1917. A larger number of live stock is being maintained on these farms than formerly, and they are being placed on a self-supporting basis by reducing the extent of experimental work with grains. More or less extensive work will be carried on with grasses and other forage-crops.

Silo-construction.—The Department of Agriculture commenced their campaign for the increase of silos in 1914. In that year three silo-filling demonstrations were given in Chilliwack. At that time there were about forty silos in the Province; to-day there are approximately 525. Of this number there have been erected by the Department's representatives fifty-three, or 10 per cent. of the actual number. More than 50 per cent. of the silos in the Province are of the type which have been advocated by the Department from the commencement of the campaign. I consider this work one of the most valuable lines which has been undertaken by the Department. The silo-construction work was carried out hand in hand with a corn-growing campaign. Silos are being rapidly constructed in all parts of the Province, especially in those districts where corn can be successfully grown. Dairymen who have silos universally state that they are getting infinitely better returns than they did before they had them. By means of the silo the farmer is able to cut down very largely on the expensive grain ration and feed his dairy and other stock far more economically and profitably. Oats and peas give ensilage of a quality equal to that of corn and are being grown by many of our farmers. British Columbia will shortly become the silo Province of the Dominion, and there is nothing that will do more to further the dairy industry and to increase milk production than the use of silos by our farmers.

HORTICULTURAL BRANCH.

The work of this Branch is ably directed by M. S. Middleton, Provincial Horticulturist and Inspector of Fruit Pests, who was promoted to the position rendered vacant by the retirement earlier in the year of R. M. Winslow, who for so many years energetically and faithfully administered the work of this Branch.

Demonstration Orchards.—The work on demonstration and experimental orchards has been discontinued, the orchards which were started some years ago having run the time agreed upon between the Department and the owners. Much valuable data have been secured by their operations as to the varieties best adapted to the respective districts, right methods of orchard practice, control of insect pests, diseases, etc., which have proved of great value to our fruit-growers.

Control of Insect Pests and Diseases.—Efficient work has been carried out by officials of this Branch towards demonstrating to fruit and vegetable growers the most effective and economical methods of controlling and eradicating insect pests and diseases affecting fruits and vegetables. Special efforts have been directed towards the control and, if possible, eradication of the codling-moth, which has obtained a foothold in some sections of the Province. Very satisfactory results have been obtained in our strenuous fight against this serious pest which has caused such a great economic loss in other countries in which it is prevalent. R. C. Treherne, representative in this Province of Dr. Gordon Hewitt, Dominion Entomologist, has carried out valuable investigation and research work in the life-history of the codling-moth, which has proved of material assistance to the officials of this Department and to our growers in combating the pest. This co-operation on the part of the Federal Government in this important work is highly appreciated.

Fire-blight.—It is satisfactory to report that fire-blight is now well under control. It is necessary, however, that our fruit-growers be vigilant and keep a close watch on their orchards for any reappearance of this serious bacterial pest, which has caused the loss of thousands of fruit-trees in the Okanagan Valley and other fruit districts in the Interior. Demonstration-work directed towards showing the most effective method of control of the apple and pear blight has been strikingly successful, and fruit-growers have had it clearly demonstrated to them that this disease, which annually causes a great loss, can be kept almost completely under control by spraying with correct mixtures at the right time. Thanks to the capable and energetic work carried out by R. C. Treherne and Dr. Cameron, Assistant Entomologist to Dr. Gordon Hewitt, Dominion Entomologist, in co-operation with officials of the Horticultural Branch, the pear-thrip, which was commencing to work such havoc in orchards on Vancouver Island, more particularly those adjacent to the City of Victoria, has been effectively handled. The work carried out by these officials has clearly shown fruit-growers how the damage caused by these pests may by the adoption of right methods be reduced to a minimum. The thanks of this Department and all fruit-growers must be accorded to the Dominion Entomologist and his competent assistants for the valuable services they have rendered.

Fruit-packing Schools.—The policy of the Department of holding fruit-packing schools in different fruit districts in order to teach correct methods of grading and packing fruit, and thereby providing a corps of expert packers amongst our young men and women who are available when their services are required for putting up ready for market our various fruits, was further extended in 1917, and in conjunction with the Education Department, who arranged classes to be held for high-school boys and girls, no less than sixty-one schools were successfully held. The total number of pupils at these classes was 1,037. With very few exceptions there was a full attendance, and great interest and application was shown by those taking the classes. In the case of adults the classes were of five and three days' duration, with six hours' tuition a day. In the case of schools for boys and girls from our high and public schools the classes were of ten days' duration, with three hours' tuition a day. Competent instructors were furnished by the Department. An entrance fee of $1 was charged; all other expenses were paid conjointly by the Agriculture and Education Departments. The value of this work, which is now in its fifth year, is plainly apparent in the steady improvement of the quality of the pack of fruit put up in our fruit districts, which bears favourable comparison with that of our United States competitors.

Pruning-schools.—A number of pruning-schools were held by our officials in the different fruit districts. This work is very necessary. Many thousands of boxes of fruit have been lost in past years by injudicious and incorrect pruning, and it is with the object of avoiding future loss from this cause that these pruning-schools are held. Much interest is shown in them by fruit-growers and they are well attended.

Experimental and Demonstration Spraying.—The officials of the Horticultural Branch, in co-operation with the Provincial Plant Pathologist, have been conducting plots at different points

in the Province, viz.: Salmon Arm, Vernon, Kelowna, Needles, Nelson, and Creston, for the control of apple-scab; at Keating for the control of apple anthracnose; and at Royal Oak, in co-operation with the Dominion Entomological officials, for the control of pear-thrips. All these demonstrations have proven very successful and instructive to growers in the different districts. They have proven conclusively in each case that these pests can by proper application of the right materials at the correct time be successfully controlled from a commercial standpoint. They have in all cases verified the information given out by the Department in the most impressive manner.

Horticultural Competitions.—During 1917, twenty-seven different horticultural competitions were held in various parts of the Province, with very excellent results. Twelve farm garden, eight city garden, three strawberry, two bearing orchard, one raspberry, and one onion competition were conducted. The interest created by these competitions wherever they were held has greatly encouraged the growing of better crops and increased production generally. The farm- and city-garden competitions have encouraged the growing of fresh vegetables, etc., to supply the home needs throughout the season, with very gratifying results.

Southern Okanagan Vegetable and Fruit Station, Summerland.—The principal aim at this station was to demonstrate that by practising proper methods tender-vegetable crops can be profitably and successfully grown in this section of the Province. The yields and returns which Mr. Hilborn, who is in charge, has obtained at the station this year fully justified the undertaking, and will lead to the encouragement of other growers taking up this profitable line of crops. The demand for these vegetable-crops—such as tomatoes, egg-plant, cucumbers, and cantaloupes—is growing very rapidly; in fact, much faster than the production can take care of it, and the accurate data as to yields, costs, and returns furnished by Mr. Hilborn are of the greatest value as information to this Department.

Coast Markets Commissioner and Inspector of Exports.—R. C. Abbott is our Markets Commissioner and is stationed in the City of Vancouver. Very valuable work has been done by this official in the way of helping farmers and fruit-growers to find the best markets for their produce. By means of a weekly market report Mr. Abbott keeps farmers in close touch with market conditions, crises, etc., and this information has undoubtedly resulted in saving farmers many thousands of dollars. Mr. Abbott as an Inspector under the "Eggs Marks Act" has done good work in the City of Vancouver in seeing that the provisions of the Act are being observed. Several prosecutions for violations of the Act have been instituted and offenders fined, and in consequence the Act is now being well observed by dealers in Vancouver. A very important work carried out by Mr. Abbott is that of the inspection of potatoes for export. All potatoes shipped to markets outside the Province are inspected by our men, and if found free from disease a certificate is granted; if not, they are not allowed to be shipped out and may be sold to evaporators or in our local markets. As a result of this work the standard of our potatoes has been well maintained in foreign markets and a good export business has been built up.

Prairie Markets Commissioner.—J. A. Grant was appointed, on the retirement of Mr. McTaggart, to fill the position of Prairie Markets Commissioner. Valuable services have been rendered to our farmers marketing their fruits and vegetables in the Provinces of the Middle West by our Commissioner. A weekly markets report was issued throughout the season from the Calgary office by Mr. Grant, and both fruit-growers and shipping organizations were kept well posted on prices, condition of shipments on arrival, best markets, etc. Valuable publicity work was also carried out and every effort made to encourage the policy of Canadian fruit for Canadian people. As a result of the vigorous campaign directed towards popularizing British Columbia fruits and vegetables in the markets of the North-west, dealers, other things being equal, will always now give the preference to the British Columbia products. The grade and pack of our fruits bears favourable comparison with the best shipped from the United States. Fruit-growers, however, must not rest content on their laurels, but continue to improve each year, for it will only be by their putting up an honest and attractive pack that they will be able successfully to hold their own against the keen competition that they will inevitably have to face from their United States neighbours.

GENERAL FIELD-WORK

Probably the most valuable results obtained by District Agriculturists and assistants, Horticulturists and assistants of the Dairy, Poultry, Live Stock, and Soils and Crops Branches

are by means of personal visits made to farmers and fruit-growers. It is by visiting the farmer on his place, discussing with him his problems and difficulties, and endeavouring to help him to find a satisfactory solution to them that the most useful and valuable work can be done, and farmers encouraged and educated along lines of better farming, which naturally leads to better crops, better stock, and more production. The greater part of the time of our officials is employed in this manner. It has been the experience of other countries that the best results can be obtained and farmers assisted to the best advantage by means of the appointment of men of the right type as District Representatives in the various districts. By their means the Department and farmers are drawn into a closer and more sympathetic touch, which ensures results in better and more effective work.

NOXIOUS WEEDS.

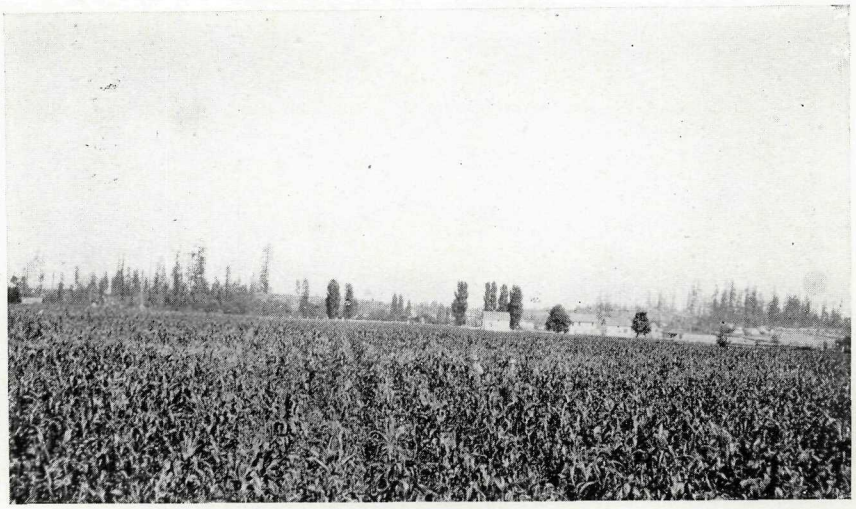
It is regrettable to have to report the continued spread of noxious weeds in the Province. Farmers do not sufficiently realize their responsibility in the matter. The "Noxious Weeds Act" is a stringent one. To see that it is enforced in their district is the duty of farmers. All Provincial constables are Inspectors under the Act, and in the event of neglect to observe the provisions of the Act Provincial constables should be informed. It would then be their duty to take the necessary action to compel delinquents to effectively destroy noxious weeds on their lands, so that they may not prove a menace to their more progressive neighbours who are endeavouring to keep their lands clean. Whilst it would be manifestly impossible to undertake the destruction of noxious weeds on all wild lands in uncultivated areas, every effort should be made to deal with weeds in settled agricultural communities, and the destruction of weeds on public roads passing through such areas should be taken in hand by the Public Works Department. It is the duty of all municipalities to take care of the noxious-weeds question within the confines of their municipality, and a rigid enforcement of the Act by municipalities will materially help to combat this evil. Weeds can be effectively handled and are not feared by the up-to-date farmer who follows a proper crop-rotation method, and it is only by these means that weeds can be effectively kept under control on the farm.

PATHOLOGICAL AND ENTOMOLOGICAL WORK.

This work is under the direction of J. W. Eastham, Plant Pathologist. We have two laboratories in which investigational and research work is carried out—at the Court-house, Vernon, and at the Court-house, Vancouver. Mr. Ruhmann, Assistant Entomologist, is in charge of the laboratory at Vernon and carries on all entomological work. A very satisfactory arrangement, through the courtesy of Dr. Gordon Hewitt, has been made between this Department and that of the Dominion Entomologist, whereby all entomological work in the Province will in future be carried out under the direction of R. C. Treherne, assistant to Dr. Gordon Hewitt, and his representative in our Province. This co-operation of the Federal Government so kindly given by Dr. Hewitt is much appreciated, and will tend to better and more effective entomological work being carried on. Mr. Eastham will concentrate his energies on the study of plant-diseases and in general pathological investigation and research work, so that our farmers and fruit-growers may be put in possession of the best information with regard to methods of control of plant-diseases and thereby safeguard themselves from economic loss. Full sets of the different plant-diseases and their different steps of development have been prepared by Mr. Eastham and are put up in Riker mounts. Similar work is being carried out in the laboratory at Vernon by Mr. Ruhmann with regard to insect pests. During the year field-work is carried out by these officials, and advice and assistance given to fruit-growers on their places with reference to correct methods of treatment and control.

INSPECTION OF IMPORTED FRUIT AND NURSERY STOCK.

This work is carried out under the supervision of W. H. Lyne, Inspector of Imported Fruit and Nursery Stock. The Provincial Fumigation and Inspection Station is situated in the City of Vancouver. All importations of nursery stock, trees, plants, etc., have to come direct to Vancouver, where they are thoroughly inspected by our officials. If found free from disease they are forwarded without delay to destination. If found infected with any serious disease or pest they may be destroyed or fumigated as occasion demands. A rigid system of inspection is maintained, and by this means the Province undoubtedly has been safeguarded from the



Corn-field near Nanaimo, B.C.

British Columbia wheat-crop. Averages 27.57 bushels per acre.

Model dairy-farm, Vancouver Island.

Good stand of corn near Victoria, Vancouver Island.
Thirty tons to the acre.

introduction of the most serious pests which have worked such havoc in other countries and been the cause of great economic loss. Inspection is maintained on all importations of corn, rice, grain, etc., and fumigation, when necessary, undertaken both at Vancouver and Victoria. Quarantine officials have been appointed at all points of entry into the Province, and a careful watch is kept on all importations of fruit and vegetables from United States points, so that the Province may be protected from the introduction of codling-moth, San Jose scale, and any other injurious pest or disease. Through an arrangement made between the Federal and Provincial Governments, the Province undertakes the work of enforcing the provisions of the Dominion "Injurious Insect and Pest Act," which provides for inspection at Vancouver. Previous to this arrangement a double inspection was carried on at Vancouver, and it was in order to do away with this unnecessary duplication of work that this arrangement was made, which is satisfactory to all parties concerned.

STATISTICS BRANCH.

The work of this Branch, under the direction of A. B. Tweddle, Statistician, has been actively carried on during the year, and as complete data as possible have been secured with regard to agricultural products and importations, both dutiable and from other Provinces of the Dominion. This information was collected in accordance with an arrangement made between the Federal and Provincial Statistics Departments, and in this way unnecessary duplication of work which heretofore existed has been to a large extent eliminated. R. H. Coates, Dominion Statistician and Controller of Censors, sent out forms which had previously been approved by us to 19,300 farmers in the Province whose names appeared on our voters' lists. The forms when filled in by farmers were then mailed to our Provincial Statistics Branch. The information was then compiled for our own use and afterwards forwarded to Ottawa for inclusion in Dominion statistics. The response from farmers was encouraging, replies being received from approximately 7,000. Taking into consideration the fact that many of our farmers as a result of the war have left the Province, and that in many cases there appeared on the voters' lists several names, all of which represent members of the same family and living on the same farm, the response from our farmers may be looked upon as eminently satisfactory. The data so secured are carefully checked by means of information secured by our officials of the Horticultural and Live Stock Branches, and by the personal canvass of Mr. Tweddle additional information is also secured from the outlying districts in Central British Columbia and the Peace River country from reliable resident farmers. Unless statistics are reliable they lose their value, but I am convinced that by means of the methods adopted by us, and the checking system which we have, the accuracy of our figures will bear favourable comparison with those of any other Province in the Dominion.

LEGISLATION.

"*Brand Act.*"—Under the supervision of the Recorder of Brands, the registration of brands throughout the Province has been effected and the duplication of brands that previously existed has been remedied. An inspection is maintained by our Inspectors at the principal shipping-points for cattle, horses, and hides, and a much-needed protection has been thereby afforded to stockmen of the Interior.

"*Dairies Regulation Act.*"—Under the provisions of this Act, official testers are licensed after having passed an examination held by our Provincial Dairy Instructor. Two official testers have also been appointed and are paid by the Department, who are stationed at Vancouver and Chilliwack. These men test all samples of milk and cream sent in by farmers, thus ensuring that they will receive equitable treatment and be paid strictly in accordance with the butter-fat contents of their milk or cream.

"*Sheep Protection Act.*"—In accordance with the provisions of this Act, a sheep-protection district has been established taking in the territory from Campbell River in the north to the south end of the Island, including all adjacent Gulf Islands, the western boundary being the line of the Esquimalt & Nanaimo Railway. All owners of dogs within this district are required to pay a licence fee of $1 for a male and $2 for a female. All dogs must also carry a metal tag for identification. The formation of this district will do much to remove the dog nuisance which has in the past militated so adversely against the extension of the sheep-raising industry. The administration of this Act is vested in the Superintendent of Provincial Police.

"*Agricultural Act.*"—By the amendments made to the "Agricultural Act" at the last session of the Provincial Legislature many important improvements in the administration of the Act have been effected. Provisions are made for the payment of a *per capita* grant to Farmers' and Women's Institutes in accordance with the membership fee, and for the formation of district institutes, which will tend towards a better and more effective co-ordination of our institute-work. Each institute district will have the appointment of a member on the Advisory Board.

"*Eggs Marks Act.*"—Much good has been accomplished by the operation of this Act. By its provisions all dealers in eggs are required to plainly indicate by means of a placard placed on all containers the grade of the eggs offered for sale, whether imported, storage, or fresh, and all restaurants or public eating-houses must, if they use Chinese eggs, prominently display a legend to that effect. A number of convictions for violations of this Act were secured in the Cities of Vancouver and Victoria during the past year, and dealers are now generally observing the provisions of the Act. All Provincial and municipal police, our Poultry Instructors and Markets Commissioner in Vancouver have been appointed Inspectors under the Act.

FARMERS' INSTITUTES.

For the first time since the inception of this important movement Farmers' Institute membership shows a material decrease. This is altogether owing to the fact that many hundreds of our members have responded to the call of Empire and are serving their country at the Front or in other lines of war-work. Interest in the work has, however, been well maintained, and many of our institutes are now strong organizations doing excellent co-operative work in the purchasing of supplies for members on a wholesale basis, thus tending towards economy in production. More appreciation of the efforts of the Department on behalf of farmers is being shown, and more willingness to take advantage of the assistance and facilities offered institute members by the Provincial Government. The number of incorporated institutes is now 148, with a membership of approximately 8,000.

WOMEN'S INSTITUTES.

It is gratifying to be able to record a year of good progress in Women's Institute work. Membership, in spite of present conditions, shows a material increase over the preceding year. Several new institutes were formed in 1917. There is no doubt but that many improvements in the conditions affecting women in our rural districts have been brought about by their agency. All the efforts of our Women's Institutes have been concentrated on patriotic and war work, and I gladly take this opportunity of expressing my admiration for the noble and unselfish national services of our institute women, which have been directed towards the alleviation of suffering and distress in war-stricken Europe. Field comforts for our fighting forces, supplies for our hospitals, food, clothing, and cash contributions for the European countries overrun by the Kaiser's hordes, food for our prisoners of war, etc., have been generously and willingly supplied by institute members. I also take this opportunity of expressing my appreciation of the work so capably carried on by members of the Advisory Board of Women's Institutes, to whose initiative is largely due the success which has attended this important organization of the women of our rural districts. There are now fifty-nine incorporated Women's Institutes in the Province, with a membership of over 3,000. The personnel of the Advisory Board for the year 1917 was as follows: Mrs. J. Johnson, Nelson, Chairman; Mrs. W. V. Davies, Chilliwack, Secretary; Mrs. Blackwood-Wileman, Duncan, V.I.; Mrs. R. L. Lipsett, Summerland.

Conferences.—Four annual district conferences of Women's Institutes were held in the months of October and November at the following places: Cranbrook, Vernon, Mission, and Duncan, V.I. I had the privilege of attending three of these conferences, being unable to be present, through unavoidable circumstances, at the Mission conference, and it gives me pleasure to testify to the unqualified success that they were. The attendance was splendid, interest well maintained throughout, and addresses and papers of a high order of merit given and read. The interchange of ideas and discussions on institute-work between delegates must tend towards better and more effective work and closer co-operation between institutes. "Patriotism, production, and conservation" was the key-note of all conferences, and delegates went back to their homes determined to preach this gospel in their institute district to the fullest extent.

AGRICULTURAL JOURNAL.

A monthly *Agricultural Journal* is issued by the Department and supplied free to all members of Farmers' and Women's Institutes where the annual membership fee is $1. This *Journal* is purely a farmer's magazine containing timely hints and articles by expert officials of this Department, members of the staff of the British Columbia University, and officials of the Federal Department of Agriculture, as well as by farmers. This *Journal* has a wide circulation amongst our farmers and is generally well appreciated by them.

AGRICULTURAL ASSOCIATIONS.

Out of a total of sixty-seven Agricultural Associations, forty-five held their annual fairs in 1917, with, on the whole, satisfactory results. Whilst there was a falling-off in the number of entries, due to the fact that farmers have to work early and late on their places and experience great difficulty in getting any assistance, the quality of the produce and live stock exhibited was generally good, and a marked improvement was noticeable in the majority of instances in the arrangements made by the fair managements for placing exhibits. The Department supplied judges for all the fairs held, the majority of whom were departmental officials. It was often necessary, however, owing to the number of fairs that were held, and to the fact that many of them were held about the same time, to get some outside assistance. The judges were instructed to carry out educative work at all the fairs in the way of explaining the reason for their awards. Much valuable work is accomplished in this way.

PROVINCIAL ASSOCIATIONS.

British Columbia Fruit-growers' Association.—This association has had a year of good progress and has been active in its efforts to further the interests of fruit-growers. The work has been under the direction of President Barnes, backed up by a capable Executive. Professor Clement, of the Provincial University, acted as Secretary, filling the position rendered vacant by the resignation early in the year of R. M. Winslow, Provincial Horticulturist. The association is to be congratulated in procuring the services of Professor Clement, who has worked constantly to advance the aims and objects of the association. The main activities of this organization have been directed towards the most efficient advertising and marketing of the fruit and vegetable crop. Good work has also been done in the way of securing from the freight and express companies more just rates. The association published a capital booklet on the British Columbia apple, which was widely distributed throughout the Prairie Provinces and elsewhere, and proved a very good advertising medium for our British Columbia fruit. A very successful annual convention was held early in the year, which was attended by representative growers from all the fruit districts of the Province. Many matters of interest were fully discussed, and there is no doubt but that good and practical results are obtained by a mutual interchange of ideas on the part of fruit-growers.

British Columbia Stock-breeders' Association.—Material assistance has been given to importers of pure-bred stock by this association, which granted a rebate of half the transportation charges on all shipments of pure-bred stock, either imported or moved from point to point within the Province. This association has done a good deal towards encouraging breeders to use pure-bred sires and to encourage the sound principle of breeding from selection. A Breeders' Directory, which must prove of great use and assistance to stockmen, was published by the association and distributed to its members in the Province and elsewhere. A successful annual convention was also held.

British Columbia Dairymen's Association.—The British Columbia Dairymen's Association has enjoyed one of its most successful years during 1917, and it is satisfactory to see that a widespread interest is being taken in the problems of the dairy-farmer. The membership of the association is steadily increasing and its sphere of usefulness continually widening. The annual convention of the association held at Nanaimo in January, 1917, was most successful, both from the point of attendance and from an educational point of view. An extra convention was held in Kelowna in June for the benefit of the dairymen in the Okanagan. This was also largely attended, and it is safe to say that the stimulus given to the dairy industry by reason of these conventions will not soon be forgotten. The policy of the association has been, as in previous years, to utilize its grant from the Government in the carrying-on of contests, competitions, and other activities that would have an educational value and encourage the industry.

British Columbia Poultry Association.—The British Columbia Poultry Association, through its central organization and local associations, has tended largely to promote and standardize the poultry industry by the help of shows and by offering special prizes at the International Egg-laying Contests. The publication of the annual Breeders' Directory has been a great aid to poultry-breeders throughout the Province. The annual poultry fairs held under the ægis of the association were very successful, and the exhibits were of a high order, a marked improvement in the quality of the birds exhibited being noticeable.

British Columbia Goat-breeders' Association.—The British Columbia Goat-breeders' Association has just concluded its first year, which has proved a very satisfactory one, and the fact that the membership reached the total of 176 shows that there was need for such an association to co-ordinate and direct the development of the industry. The work done during the year includes assistance to importers of pure-bred stock by refunds of freight, which has helped members to bring some fine stock into the country, and helped towards a successful exhibit of milk goats at Vancouver Fair, a campaign of education as to the value of milk goats and their products, and various other minor activities. With the co-operation of the Dominion Government, pure-bred registry was inaugurated for goats, and a representative of the Live Stock Commissioner at Ottawa spent some months in the Province inspecting milk goats and recording them as foundation stock, from which it is hoped to build up a successful industry.

British Columbia Bee-keepers' Association.—This association is growing rapidly and has now a very good membership. It is doing good work in the way of encouraging right methods of bee-keeping amongst its members. A most gratifying exhibit was staged by the association at the Vancouver Exhibition, which attracted a great deal of interest and favourable comment, and which was generally a fine educative exhibit. It is an interesting and, if properly managed, a lucrative side-line of farming and is rapidly increasing throughout the Province, and before long British Columbia will be exporting honey. The quality of the honey produced in many of our districts cannot be excelled, and the average production per hive bears very favourable comparison with any other honey-producing country.

Vancouver Island Flockmasters' Association.—This association reports a year of progress. In addition to the placing of pure-bred rams in the different districts of Vancouver Island and adjacent Gulf Islands for the improvement of flocks, the grading and classification of wool is also undertaken, and as a result higher prices have been obtained. The wool is sold by the association on a co-operative basis after it has been properly graded and packed.

FEDERAL GRANT.

By means of the moneys granted the Provincial Department of Agriculture under the terms of the Dominion "Agricultural Instruction Act" it has been made possible for us to greatly extend the scope of our educative activities. A portion of this grant is used towards the appointment of Instructors and Inspectors, and several of our agricultural experts have been appointed under this section. The following lines of work are also taken care of by this Federal appropriation: The operation of field-crop demonstration stations, dry-farming demonstration stations, horticultural demonstration stations, poultry demonstration stations, and egg-laying contests; alfalfa-plots, silo-construction work, drainage demonstrations, seed distribution and co-operative variety tests, seed production; Cow-testing Association work; bee-keeping; field-crop competitions; Boys' and Girls' Clubs; fruit-packing schools; market-work; pathological and entomological investigation and research work; weed investigation; and, in addition, the whole work of compilation, editing, and printing our monthly *Agricultural Journal.* By means of the policy of the Federal Government in making appropriations to the different Provincial Governments for carrying on various lines of educational work we are enabled to undertake these valuable lines of instructional and educational work, which undoubtedly has proved of the utmost benefit to our agriculturists throughout the Province. The supervision of expenditures of this grant by the different Provinces is undertaken by Professor W. J. Black, Commissioner of the "Agricultural Instruction Act," Ottawa. Valuable advice and assistance towards the wisest and best expenditure of this grant has always been freely given by Professor Black, and it is with great pleasure that I express the thanks and appreciation of our Department for his kindly help. The moneys are expended in accordance with an agreement made at the beginning of each fiscal year between the Dominion and Provincial Ministers of Agriculture.

Pioneer farmers in the Bulkley Valley.

A dairy-farm in the Salmon River Valley, near Prince George.

BOARD OF HORTICULTURE.

Two meetings of the Provincial Board of Horticulture were held during the year and various matters dealt with, viz.: Inspection of nursery stock, trees, plants, fruits, etc., and the fumigation of imported rice, corn, and grain. The following is the personnel of the Board: J. C. Metcalfe, Chairman; W. C. Ricardo, K. R. Streatfield, C. F. McHardy, R. M. Palmer, A. J. Woodward; W. E. Scott, Deputy Minister of Agriculture, and Hon. John Oliver, Minister of Agriculture, ex officio.

APPRECIATION.

In concluding my report, I take the occasion of expressing the thanks of the Department to the Canadian Pacific Railway, Canadian Northern Railway, Grand Trunk Pacific Railway, Pacific Great Eastern Railway, Kettle Valley Railway, and the Esquimalt & Nanaimo Railway for their courtesy in affording transportation privileges to those officials of the Department who in the discharge of their official duties have to travel through the various farming districts of the Province. This concession has greatly facilitated our work amongst the farming communities.

It is with pleasure that I bear testimony to the capable way in which the officials have administered the work of the various branches and divisions for which they are responsible, and for the loyal co-operation and work of all other members of the staff.

A TRIBUTE.

The Department of Agriculture pays a tribute to those gallant men, former members of the staff, who have made the supreme sacrifice on the battle-fields of Europe, and who died like loyal Britishers fighting for the cause of freedom against oppression and wrong: Captain Norman S. Payne, Accountant; Lieutenant Bernard Shipton, Fruit Inspection Branch; Flight-Lieutenant Charles Rayner, Fruit Inspection Branch.

All of which is respectfully submitted.

WM. E. SCOTT,
Deputy Minister and Superintendent of Institutes.

REPORT OF PROVINCIAL HORTICULTURIST AND INSPECTOR OF FRUIT PESTS TO JULY.

R. M. WINSLOW.

W. E. Scott, Esq.,
Deputy Minister, Department of Agriculture, Victoria, B.C.

SIR,—I have the honour to report on the work of the Horticultural Branch for the period January 1st to July 7th, 1917, which is my final report as Provincial Horticulturist and Chief Inspector of Fruit Pests.

SCOPE OF THE HORTICULTURAL BRANCH.

My report covering 1916 can serve very well under this subject for 1917. The policy followed during the year is essentially the same as that of last year. In many lines the work is being being somewhat extended; in others reduced.

CHANGES IN STAFF.

The period which this report covers is marked by an unusual number of resignations, for various causes. These resignations have necessitated changes. E. W. White, Inspector for Vancouver Island, took over the whole of the Branch work on the Island and part of that on the Lower Mainland. H. H. Evans was appointed Inspector, under P. E. French, vice R. J. Kyte. J. A. Grant, of Victoria, was appointed Prairie Fruit Markets Commissioner, vice W. E. McTaggart. E. C. Hunt, Acting Assistant Horticulturist, Grand Forks, was given charge of the Kootenay territory as well as his own. On January 2nd C. P. Pearson was appointed Secretary, vice B. Whittaker, who resigned on December 18th. J. Tait, Inspector for Summerland in 1916, was re-employed on March 1st.

Needless to say, these numerous changes have made it extremely difficult to carry on the work of the Horticultural Branch with even a reasonable measure of efficiency.

ORCHARD VISITS AND DEMONSTRATIONS.

This line of work, which is one of the most valuable and most appreciated of all activities of the Branch, was continued in 1917, but in all districts there is less of it than usual because of the reduced staff.

PRUNING-SCHOOLS.

A total of twelve pruning-schools was held during the winter of 1916-17, as shown in Appendix No. 1. The number of these pruning-schools was smaller than usual: Firstly, because a very large proportion of the fruit-growers and orchard-helpers of the Province have now been pupils of these schools; and, secondly, because the great shortage in help through the fruit districts made it impossible for many, who would otherwise have attended, to give the necessary week to this work. It is a satisfaction to say, however, that the general class of tree-pruning throughout the Province has greatly improved since the pruning-schools were started, and the deficiencies in pruning methods which may now be observed are much more largely due to lack of labour than want of knowledge.

PACKING-SCHOOLS.

This Branch has just concluded a series of sixty packing-schools, which is the largest number ever held in one season. The fruit districts were very short of packers in 1916, and expect a considerable increase in crop in 1917, for which a large number of new packers had to be trained.

Arrangements were also made with the Education Department under which they paid the cost of six-lesson periods of instruction to the pupils of high schools and of the fourth grade in public schools; twenty-eight of the schools were of this type. The Agricultural Department supplied the Instructors and carried on all of the work after the applications were received by the Education Department. The plan worked very satisfactorily, and from many districts it has been heard that the school pupils averaged up well, and will probably save the situation with respect to packing in the season of 1917.

From Appendix No. 2 it will be noted that the pupils totalled 1,037, with an average proficiency of 84.5 per cent.

CROP ESTIMATES.

The Horticultural Branch has already issued a preliminary estimate on the various small-fruit crops. A further report on small fruits and a preliminary report on tree-fruits will be issued as soon as possible; at the same time, there will be a preliminary report on the acreage of vegetables and their condition. The various members of the Horticultural staff have co-operated with the Statistics Branch of the Department in securing field-crop and live-stock reports in their districts. In the Lower Mainland District the Inspectors under the Coast Markets Commissioner paid visits to over 900 potato-growers, taking records of their acreage and varieties, soil conditions, seed-treatment, etc. This will be most valuable information in moving the 1917 potato-crop in the fall.

INSPECTION AND PEST-CONTROL WORK.

This work was continued during the present season along very much the same lines as those followed in 1916.

INSPECTION OF POTATOES FOR EXPORT.

The movement of potatoes from January 1st into May was very heavy. Mr. Abbott's reports show a total of 943 cars and 268 sacks inspected and passed for export or for Eastern Canadian points since January 1st. The condemnations for the same period totalled 341 cars and 150 sacks. Your Horticulturist is more than ever convinced of the extreme value of this work in establishing a desirable reputation and permanent markets for British Columbia potatoes.

NURSERY INSPECTION.

At all of the nurseries of the Province the necessary inspection of stock for spring shipment was made. In many cases it was possible to give the nurseries, after general inspection, a release form permitting shipment of the whole of the stock; in other cases it was necessary to give detailed inspection with a view to preventing shipment of diseased or injured trees.

All nurseries are required to be bonded and licensed under the Act. This Branch has pushed this matter vigorously and is pleased to report that it is now in much more satisfactory shape than it has been hitherto.

CODLING-MOTH.

Okanagan Landing.—The work commenced in this district in 1916 was continued. Three power outfits were operated, and it is proposed that, if justified, three sprays be applied during 1917. On request of this Department, R. C. Treherne, of the Dominion Entomological staff, was giving his time as far as possible to the codling-moth work during the codling-moth season. The result of his investigations as to life-history details will, of course, govern our spraying programme. The first spray has been already put on and all of the old bands reinspected.

Westbank.—The same general plans as apply at Okanagan Landing apply at Westbank. At the latter point the infection was comparatively slight, and the work of 1917, followed through vigorously, should bring the codling-moth very close to eradication.

Walhachin.—Quarantines have been placed on the orchards in and near the area known to be infected. The trees have been pruned under our direction and the first spraying has already been applied. The conditions in this district are very favourable for a quick clean-up and good results should be had.

THRIPS-CONTROL ON VANCOUVER ISLAND.

This work has been continued along the lines of the previous season, except that the power outfit at Gordon Head was operated by the growers themselves. The results are apparently very satisfactory. General improvement in the condition of the orchards, which have now been sprayed for two years, is very well marked and is having good effect in promoting general spraying.

It is now well established that the thrips can live and reproduce on the common maple and possibly on other native plants; this further establishes the contention that the thrips is here to stay. The two years' work have, however, shown amply that it can be controlled by methods well within the reach of commercial fruit-growers.

BLACK-CURRANT BUD-MITE.

R. Glendenning was again employed during last spring to inspect black-currant plantations on Vancouver Island. His report shows greatly reduced infection as a result of the 1916 season's work, and during the present season he secured the destruction of a number of bushes found to be infected.

As far as the cultivated black currants are concerned, we are satisfied that the policy followed will, if continued for another year, result in eradication. Mr. Glendenning has, however, just reported that he has at last discovered the mite well established on the native currant; this being the case, eradication is no longer possible.

FIRE-BLIGHT.

Throughout the winter of 1916-17 your Inspectors and Assistant Horticulturists in the fruit districts have worked vigorously to secure a complete clean-up of the over-wintering blight-cankers. This has taken a large amount of orchard-to-orchard visitation, some cases requiring as many as three or four visits. However, a very good degree of co-operation has been had from the growers, and there have been no cases where it was necessary to adopt any measures stronger than persuasion.

At the present time the amount of blight in the Province is very slight indeed; it has been less, in fact, than in any year since 1912.

INSTITUTE AND OTHER MEETINGS.

A large number of meetings were held throughout the fruit districts during the latter half of February and the month of March; these meetings were addressed by various members of the Horticultural staff. The attendance, as a rule, was excellent. A number of other meetings and demonstrations have been held at various times.

DEMONSTRATION ORCHARDS.

A certain amount of supervision to the orchards at Nanaimo, Hammond, Birchbrook, Rossland, New Denver, Wardner, Baynes Lake, and Windermere is being continued. The Department also did some replanting in the orchard at Lower Nicola, replacing winter-killed trees. In some of these cases the agreements have not yet expired, and in others it seems desirable, in the interests of the districts served, that supervision be continued for another year or two at least.

EXPERIMENTAL STATION AT SUMMERLAND.

The small-fruit and vegetable experiment station at Summerland, operated under the direction of this Branch by J. L. Hilborn, is being continued in 1917 on lines similar to those of previous years.

The strawberry-plot at Hatzic is also being continued and should give valuable results in 1917 in the way of different varieties being tested.

NORTHERN EXPERIMENTAL PLOTS.

Following the resignation of A. R. Neale, Acting Assistant Horticulturist, Prince Rupert, the Department decided to discontinue the operation of the plots at Terrace and Lawn Hill, operating only that at Bella Coola.

HORTICULTURAL CROP COMPETITIONS.

The number of crop competitions of which the Horticultural Branch has had charge totals thirty in 1917, as against twenty-four the previous year. Most of these competitions have already been judged by officials of the staff for the first time; all are to be judged twice, and in some cases a third judging will be given.

The competitions are classifiable as follows:—

Kind of Competition.	No.	Place.
City garden	5	Victoria.
„	2	Maywood and Lynn Valley.
„	1	Nelson.
Farm garden	14	Sooke, Metchosin, Penticton, Natal, Robson, Needles, Harrop, Wynndel, Hammond, Nicola, Crawford Bay, Baynes Lake, Willow Point, and Mara.
Orchard, bearing	3	Notch Hill, Grand Forks, and Willow Point.
Onion	1	Kelowna.
Strawberry	3	Maple Ridge, Saanich, and Gordon Head.
Raspberry	1	Maple Ridge.

EXPERIMENTS IN SPRAYING.

The apple-scab spraying experiments of 1916 were continued; in addition to the plots at Vernon, Kelowna, Samlon Arm, Nelson, and Creston, a plot is being operated at Edgewood for the Arrow Lakes District. Numerous other experiments are being conducted on the control of insects and diseases. The experiment on apple-tree anthracnose on Vancouver Island shows remarkably good results.

APPLE-STORAGE EXPERIMENTS.

The six years' tests of the cold-storage capabilities of different varieties of British Columbia apples in different districts were concluded in June, 1917. Under instructions, H. Thornber has taken possession of all of the material with a view to preparing a final report and also a snort summary of the same, the latter for publication and the former to be made available to those few who would be most directly concerned.

PRAIRIE MARKETS COMMISSIONER'S WORK.

Mr. McTaggart's resignation, as above recorded, made necessary the appointment of the new Commissioner, J. A. Grant, of Victoria, who took charge on April 15th, and has since been engaged very largely in getting acquainted with the fruit districts of this Province and of the North-western States and in visiting various Prairies centres. The series of weekly reports started on June 16th.

COAST MARKETS COMMISSIONER'S OFFICE.

Mr. Abbott and the staff have been engaged principally, since the beginning of the year, on potato-inspection work, shipments, and the instruction to potato-growers on the selection and disinfection of seed. Mr. Abbott's annual report will, however, go fully into these activities.

BRITISH COLUMBIA FRUIT-GROWERS' ASSOCIATION.

The Horticulturist, as Secretary of this association, devotes a considerable share of his time to this work. The membership for the current season is being well maintained, the total up to date being 486 and eleven life members.

The Secretary made all arrangements for the annual meeting, and also arranged and attended two Directors' meetings, five Executive meetings, and several other committee meetings. The annual report was prepared for publication and a price-list of spray materials was issued. The association and the Department, in conjunction, have worked to advantage in securing low railway rates for the movement of fruit-harvesters from the Coast cities to the fruit districts, and have also been of assistance in organizing the labour of women and children in Vancouver, etc., so as to make it available. A good deal of the Secretary's time has been devoted to correspondence in connection with the British apple embargo and the preparation of the association's case in that respect.

A full report of the association's work, with financial statement, will be submitted to the Department in due course.

All of which is respectfully submitted.

R. M. WINSLOW,
Provincial Horticulturist and Inspector of Fruit Pests.

REPORT OF PROVINCIAL HORTICULTURIST AND INSPECTOR OF FRUIT PESTS.

M. S. MIDDLETON.

W. E. Scott, Esq.,
Deputy Minister, Department of Agriculture, Victoria, B.C.

SIR,—I have the honour to submit herewith my ninth annual report as Assistant Horticulturist for the Kootenay and Boundary Districts, and my first report on the work of the Horticultural Branch for the period from July 7th to the end of the year 1917 as Provincial Horticulturist and Inspector of Fruit Pests.

ACTIVITIES.

The general work of the Horticultural Branch has been carried on along somewhat similar lines to those conducted by my predecessor, R. M. Winslow, resigned, with the exception that the Secretaryship of the British Columbia Fruit-growers' Association was taken over by Professor F. M. Clement, of the University of British Columbia. This change has enabled the Provincial Horticulturist to give more detailed attention to the very important work of his Branch in the office and in the field. It has allowed and encouraged a more personal working connection between the Horticultural Branch and the growers and growers' agencies, etc., throughout the Province. An opportunity was permitted to get out and get in touch with conditions, and so acquaint myself with the actual needs and demands of the work. At the same time, the heartiest co-operation has been encouraged between the Secretary of the British Columbia Fruit-growers' Association and this Branch, your Horticulturist being added as an ex-officio member of the Executive and Directorate of the British Columbia Fruit-growers' Association.

Co-operation with and co-ordination of the work of the Horticultural Branch with that of the other branches of the Department and the Dominion officials in the Province have been aimed at, and at least some progress made towards this end. A working understanding between the Provincial Pathologist and the Acting Provincial Entomologist has been agreed upon, in that the officials of this Branch work with and under their guidance in pest-control work, etc.; the officials of this Branch to receive all local credit in their respective districts, while the co-operating heads receive all Provincial credit for the work carried out. This arrangement has met with very pleasing appreciation from all concerned.

The general work of the Branch need only be mentioned as consisting of all duties in connection with fruit and vegetable crops, special attention being given to the successful growing of same, control of pests, etc. The proper marketing of the crops has also been well taken care of, and every assistance given by the Markets Commissioners towards holding our present markets and extending them wherever opportunity offered.

OFFICIALS.

Assistant Horticulturists.—These men are all doing horticultural and fruit-pest inspection-work, which includes inspection of orchards for diseases and insect pests, and the control of same; conducting of demonstration spraying in the control of pests; inspection of all exports in the way of fruit and vegetables to foreign countries; inspection of foreign cars for insect pests, etc., and general assistance to the fruit and vegetable growers in the district; and, at the same time, the collection of data as to crop statistics in their particular district.

Markets Commissioners.—The main work of the Markets Commissioners is to keep in touch with the markets and to encourage the shipping of the products in most demand in these markets, and to give advice of the arrival of the same, and, generally, to assist the British Columbia shipper in marketing his produce to best advantage.

DEMONSTRATION FIELD-WORK.

Realizing the importance of personal orchard visits and discussions on the spot, this line of work has been continued and encouraged as far as possible, but, owing to the great reduction in the staff as compared with former years, along with the growth of the industry, it was impossible to visit every orchard in each section. It is, however, pleasing to state that, by energetic work on the part of the Inspectors, the majority of the most urgent calls were made and main orchards visited at some time during the year. It was impressed on all fieldmen that, during the war, only the most urgent and necessary work should be carried on, and at the least expense consistent with efficiency. This practice has been followed out.

PRUNING AND PACKING SCHOOLS.

The pruning and packing schools held during the late winter and early spring were fully reported on by my predecessor, and nothing further need be added, except to state that the expression of opinion on the results obtained by these classes warrants their continuation, at least, on somewhat modified lines.

FARM SURVEY AND STATISTICS.

During 1916 a very thorough survey of the fruit and vegetable sections of the Province was made by practical and painstaking enumerators. This work is being followed up by a card-filing system, whereby every grower will be numbered and a record of his place kept, including acreage in different crops; number, variety, and age of trees, as well as cultural methods and results, in such a way that it can be seen at a glance. These cards will be made effective for five years by additional data from notes entered in a pocket loose-leaf field-book, which will show all annual crops, new plantings, replacements, or losses, as well as yields which may occur from year to year. This work is being undertaken with a view to co-operating with the Statistical Department, so that better, fuller, and more accurate information may be available.

In co-operation with the Departmental Statistician, crop estimates and reports have been furnished from time to time during the growing season by the members of this Branch, and these have been followed up by a detailed, accurate report at the end of the season, showing the actual shipments which have been made during the year. In this way the work of the Statistical Branch is greatly assisted, not only by way of material for a quick preliminary report, but the enumerators having the knowledge and interest of their districts at heart, it naturally follows that more accurate information is obtained. The Horticultural Branch, in turn, benefits by the systematic compilation by the Statistician of all the available information and data relative to fruit and vegetable crops. Information and data are also gathered in a similar way each year from the various jam, canning, and evaporator plants in the different parts of the Province; this is a very valuable and useful information for each official in his own district, and can be obtained easily and accurately by him.

INSPECTION-WORK.

Inspection constitutes one of the most important phases of the work of this Branch. It consists of prevention of the introduction of any serious pest in the Province or any section; inspection of all nurseries and nursery stock grown in the Province; the control or eradication of any pest within the Province; the inspection and certification of export shipments of both

fruit and vegetables; the protection of our markets, and, at the same time, encouragement in the production of cleaner and better crops. In all this work acknowledgment is due to the hearty co-operation of the various branches of the Provincial Department of Agriculture, the Inspection of Imports Branch, the Plant Pathologist and Entomologist, the Dominion Department of Agriculture officials, and the shippers and growers.

Inspection of Foreign Empty Cars.—One of the greatest sources of infection from codling-moth is, without doubt, through the foreign railway-cars brought into the Province from the codling-moth infested areas in the United States. These cars are all inspected at central, divisional, or icing points; all rubbish is cleaned out and burned, a thorough inspection given, and the cars iced several hours before loading. As an instance of the importance of this work, this year no less than fourteen healthy, full-grown larvæ were discovered in one foreign car at Okanagan Landing.

Inspection of Nurseries.—A most careful preliminary, summer inspection is given to nurseries in the Province; this is followed up by a thorough tree-to-tree inspection at the time of digging, and after they are dug, or, at least, before they are shipped out; all inferior, infested, or infected stock is destroyed. Woolly aphis, crown-gall, hairy root, and winter injury were the main sources of condemnations. This is the only safe way of protecting the growers and the Province against the possible introduction or spread of any serious pests, and the varying results towards success due to planting inferior stocks.

The nursery business has not been as active as usual during the last few years; a goodly number of firms have gone out of business, or have discontinued propagating fruit-trees and fruit-plants, and are giving their attention to the ornamental business and floral trade. This accounts for the laxity to take out the nursery bond and licence under the "Agricultural Act, 1915," Part VII. The demand for nursery stock in 1918 will be a great improvement over the last few years, due to the successful year experienced by the fruit-growers. A great many soft fruits, such as apricots and peaches, will be planted, and a number of the winter-injured varieties in some districts will be replaced by more adaptable sorts.

Codling-moth.—The quarantine areas at Westbank, Okanagan Landing, and Walhachin were given close attention during the season, and we are able to report encouraging results in the reduction of worms to about 10 per cent. of last year's number. At Okanagan Landing the area has been greatly reduced, so much so that negotiations are being considered to destroy all the fruit in the two remaining orchards with a view to eradicating the pest in this section. The work will be carried on at Westbank and Walhachin as in previous years, viz.: All trees will be banded and several band inspections made during the larvæ and pupa periods, and two and three sprayings given; all the older trees scraped to remove their rough bark; all the fruits inspected thoroughly, all wormy and cull fruit being destroyed by boiling, and the good fruits, after close inspection, shipped out of the Province.

San Jose Scale.—No new infested areas were found and the infested orchards at Spences Bridge have been cleaned up successfully. Some infestation was found on the choke-cherry at this point and careful attention is being given to its eradication.

Woolly Aphis.—This pest is on the increase, particularly in the Okanagan Valley; every effort will be made this coming season to assist the growers in controlling it.

Pear-thrips.—This pest, which gained such a thorough foothold on the southern end of Vancouver Island some few years ago, and on which the Provincial Horticultural Branch, in co-operation with the Dominion Entomological Branch, carried out very successful work during the past two years, has by demonstration proven to be easily and successfully controlled by spraying. It has been discovered that this insect pest is not dependent upon our common deciduous fruit-trees, but may be found working on the maples, willows, choke-cherries, and even on the Douglas fir, and on many of our common shrubs and plants, so that the possibility of eradicating it is out of the question. However, its life-history has been exhaustively worked out by the Dominion Entomologists, and the practicability of spraying for its successful control has been fully demonstrated, so that we need have no anxiety in this connection. E. W. White's report deals with this pest in detail, and for still further reference it might be noted that a Dominion bulletin is about to be issued on the pear-thrips work on Vancouver Island.

Black-currant Mite.—Infestation in the Duncan District by this pest was well taken care of by Mr. Glendenning, whose report may be referred to. Discovery of the pest on the wild currant places a serious phase on eradication possibilities.

Strawberry-root Weevil.—This pest was troublesome in the strawberry sections of Vancouver Island and on the Lower Mainland, but growers are experiencing that it can be kept in check by following the preventive measures as advised by the Government officials—viz., rotation, short-cropping system, and delaying the ploughing-down of the patch until the insects have laid their eggs.

Peach-twig Borer.—This pest is on the increase and has caused considerable loss to growers in the southern end of the Okanagan Valley, particularly in apricots and peaches. A survey is at present under way to ascertain the number of trees, their age, size, the spraying equipment owned or available, with a view to encouraging a community effort for successful control. A campaign will be worked out along educative and gentle persuasive lines towards controlling the pest, but in some cases more drastic measures may have to be resorted to with some of the neglected or absentee orchards.

Grasshoppers and Wireworms.—During 1917, grasshoppers did great damage in some sections, particularly at Kelowna and Midway. Excellent results were obtained at Kelowna by using the Kansas mixture, as per Mr. Hoy's report.

Wireworms were also numerous and troublesome in the Kelowna section in 1917, and experiments were carried on by Mr. Hoy at Kelowna, using rice, bran, and molasses as a trap for the worms, with very satisfactory results.

Fire-blight.—Generally speaking, those districts where blight-infection was so bad in the past look very encouraging. The shortage of labour for this particular work has affected its control and possible eradication. The inspection for hold-over cankers of this disease is carried on during the winter months, and very excellent results through the efforts of this Branch can be reported. It is a matter in which the majority of the work has of necessity to be carried out by the growers themselves, but at the same time a great deal of assistance in locating and cutting out the blight is being rendered by our fieldmen. Blight showed up quite badly in the Armstrong, Vernon, Kelowna, and Grand Forks Districts in 1917, and extra efforts are being exercised by our men in these sections; other sections show greatly improved conditions.

Apple and Pear Scab.—Apple-scab was not as prevalent during 1917 as in previous years. Our scab-control work was carried on as usual with equally marked success at Salmon Arm, Vernon, Kelowna, Needles, Nelson, and Creston; some conbination pear-thrips and scab sprays were also used on Vancouver Island with excellent results. Comparative tests with different spray materials and mixtures were carried on by Mr. French at Salmon Arm. Locality tests were carried on at Salmon Arm and Vernon, and, in addition, different strengths of lime-and-sulphur solution for scab-control were tested out at Vernon. The detailed results are contained in Mr. French's report. At all the different points above mentioned the three-year test-plots for scab-control were continued on the same trees, and the continued striking success was obtained with lime and sulphur at different times during the scab-infection season. For further details refer to the reports of Assistant Horticulturists.

Apple Anthracnose.—This disease has become quite serious in the moist Coast sections. Fall spraying with Bordeaux mixture at different times was again carried on in 1917 at Keating with very good results.

Peach-mildew and Leaf-curl.—Owing to seasonable conditions these diseases were not troublesome, and sprayed plots showed no marked results over non-sprayed ones.

Potato-diseases.—Late blight of potatoes, particularly in the Lower Mainland districts, was extremely prevalent during 1917; in some cases where inspections were made as high as 80 per cent. of the tubers were found to be infected. Other common potato-diseases were common scab, *Rhizoctonia*, and *Fusarium* wilt. Owing to the scarcity of good seed in the spring of 1917, much infected stuff was planted, and, although every effort was made by district men to impress on planters the importance of thorough selection and disinfection of the seed, much room for improvement remained, and was the cause of great losses and dissatisfaction when the potatoes came on the markets. Every effort will have to be made towards improving this very important crop, not only in respect to disease, but in the selection of seed and improvement of grading and marketing.

Other Insect Pests and Diseases.—Many other insects gave considerable trouble in local sections throughout the Province and were attended to by the fieldmen as far as possible. The following might be mentioned: Cutworms, onion-thrips, cabbage, turnip, and onion maggots, cabbage-worm, green aphis of the apple, and other crops; bud-moth, oyster-shell scale, and red

spider. In fungus diseases: Raspberry anthracnose, strawberry-leaf spot, and mildew; also many other minor insect pests and diseases affecting vegetable and fruit crops.

Summary of Pest Situation and Control.

It has always been a great deal of pleasure to all Government men to be able to state that British Columbia was practically free from all pests. In a degree this might still be said without exceeding the practical truth. With our rigid and careful service of inspection of imports and field-work, this Province is in a class by itself as far as serious pests are concerned. There are certain indigenous pests, or those just as common as the plants on which they live, which no inspection system could guard against, but there are very few pests of a really serious nature at the present time, with perhaps the exception of the codling-moth, which happily is confined to small areas, and these areas are being rapidly reduced by our rigid inspection and spraying measures. It cannot, of course, be expected that this pleasant state of affairs will continue for all time, as pests are bound to gain their entrance sooner or later in spite of every precaution. It will, however, be our serious aim to keep out every pest which might become a dangerous one, and to control or eradicate, as far as possible, those pests which have already gained an entrance.

Demonstration and Experimental Orchards.

The majority of the demonstration and experimental orchards, which were started in 1911 on a five-year agreement, have been turned over to the owners. In the case of some of these orchards the district men have seen fit by mutual agreement to carry on the orchards at no cost to the Government, except for supervision; the owners agreeing to give all information and keep records as desired. The experimental orchards at Nicola, Windermere, Wardner, Waldo, and Rossland have required a number of replacements each year due to varieties not succeeding, and it was felt advisable to keep these on under our supervision until the orchards could be left in at least a fairly complete condition. This will be made possible after the spring of 1918, when all varieties not likely to succeed will be replaced by more suitable hardier sorts, and the orchards will be turned over to the owners in as good a commercial state as possible under existing local conditions.

The results obtained from these demonstration orchards have been as good as could be expected under a five-year agreement. The experimental orchards have at least allowed us a good opportunity to test out different varieties in the different sections and to ascertain what varieties of fruits might succeed in each. The information, although negative in the majority of cases, is very valuable in giving advice to future settlers in these parts.

Central British Columbia Plots and Test Trees.

At Bella Coola, S. LeC. Grant continued to operate the plot this past season, but the severe flood which visited the valley in October destroyed all the crops, so that no report could be made. The plot has been closed down.

A few fruit-trees of varieties likely to succeed were sent out by this Branch to be planted on the different Agricultural Department plots in the central sections of the Province; no report has been received on these.

Strawberry-plot at Hatzic.

Owing to changes in Branch officials and general labour shortage, it was not possible to give this plot the attention it required, and it was considered best to cancel the lease between the Government and Mr. Catherwood, on whose place the plot was located. The size of the plot—namely, ½ acre—was considered too small in order to do justice to the small-fruit possibilities of the district. The discontinuance of this work in the Mission-Hatzic District is to be regretted, and it is hoped that a plot on a much larger scale may be undertaken by the Government, where all small fruits adapted to this district could be grown and possibilities demonstrated from a commercial standpoint.

Southern Okanagan Vegetable and Fruit Station, Summerland.

The work at this station, under J. L. Hilborn, was well executed in 1917, very excellent yields and returns being obtained at the station. It has been very clearly demonstrated that by proper methods tender vegetables can be grown successfully and profitably in this section.

A large and growing market for all tender vegetables is opening up yearly, and the work done by Mr. Hilborn (backed up by his long and successful experience in this line of work in the East) has unquestionably created a wonderful interest in the possibilities of this section of the Province in the production of these crops. The accurate data as to yields, costs, and returns furnished from this station are exceptionally valuable to have at hand, and the work should be continued. Mr. Hilborn's report fully covers the work done at the station.

HORTICULTURAL CROP COMPETITIONS.

There were twenty-seven competitions held in the Province during 1917, as follows:—

Farm garden	12
City garden	8
Strawberry	3
Bearing orchard	2
Raspberry	1
Onion	1
Total	27

The interest and friendly rivalry created by these various competitions in the different sections are very satisfactory, and undoubtedly lead to better crops and increased production. The judging was done by the district men who were in a position to extend any help or information with regard to the crops and the cultural methods practised while doing the scoring. This is a good line of work and should be continued with some modification in the number and size of the prizes awarded.

PUBLICATIONS.

The supply of horticultural circulars and bulletins in the Department is in most cases exhausted, or almost so, and to meet the great demand for this information the Branch is having prepared some fifty-odd circulars 5¾ x 8¾ inches in size, four to eight pages, with two to four illustrations. These will be written by experts on the particular subjects, with the object of supplying up-to-date, concise, practical information suited to our local needs and conditions.

Contributions to the Department's *Agricultural Journal* and other papers have been prepared from time to time on timely subjects.

JUDGING AT FAIRS AND FLOWER-SHOWS.

Practically all the fruit and vegetable judging at the Provincial fairs was done by officials of this Branch. These fairs afford a good opportunity for meeting the growers, discussing their problems and the merits or demerits of their produce, so that the time entailed on this line of work is usually well spent. A report on all fairs judged is submitted to the Department at the end of the fair, and comment, suggestions, or recommendations towards their improvement is made to the Secretary of fairs.

INSTITUTE AND LECTURE WORK.

A good deal of the time of the officials of the Branch is devoted to attending meetings and demonstrations at which are given lectures and talks on various horticultural subjects. The specific information at hand, backed by our demonstration and experimental work in the different districts, is of the greatest value to the growers.

The appreciation expressed by the growers at these institute and other special meetings warrants the extension of this valuable feature of our work.

PRAIRIE MARKETS COMMISSIONER'S OFFICE.

J. A. Grant was appointed in April to fill this position on the resignation of W. E. McTaggart. The Commissioner spent some considerable time in acquainting himself with trade and crop conditions in British Columbia and in Western United States before establishing himself at Calgary, on the Prairies, where his main work was carried on. The way in which Mr. Grant acquainted himself with conditions and became familiar with the markets and their peculiar requirements on the Prairies has met with the most cordial appreciation from growers and the trade. The extension of our markets to the larger centres in Eastern Canada in 1917 was also encouraged, with very promising and gratifying results.

The long, practical fruit experience which Mr. Grant possesses has enabled him to give very valuable information to the growers with respect to the condition of their fruits on arrival on the market, besides useful hints and suggestions given in the Commissioner's weekly bulletin issued from June to November. His work has also included numerous personal visits and letters to growers and shippers. It can well be stated that there has been the heartiest cordiality between the Commissioner and the British Columbia growers and shippers, brokers, jobbers, and retailers of fruits and vegetables on the Prairie and Eastern markets. The knowledge and information gathered by the Commissioner during the year will be of still greater value in years to come, and it is hoped that his valuable services may be retained and his work extended as our markets demand.

The Commissioner's report deals fully with the work.

COAST MARKETS COMMISSIONER'S OFFICE.

This office, at Vancouver, under R. C. Abbott, has been of invaluable assistance to British Columbia growers and shippers on the Coast. Much timely information has been given through the weekly market reports issued by his office from June to December, inclusive, as well as through many personal letters and visits made to growers and shippers in British Columbia.

The export potato trade was given particular attention, and the inspection system on potatoes and export fruits has greatly improved our exports and been heartily received by all concerned. Much good advertising by timely articles in the press, and the distribution of circulars on the canning of fruits and vegetables, the potato and fruit booklets, etc., have informed and greatly helped the growers and consumers of our fruit and vegetables to get together to the very best advantage. In this way the great wastes which often occur in the larger centres have been eliminated to a great extent.

The Commissioner also assisted in the enforcement of the "Eggs Marks Act," with very gratifying results.

The full report of the Markets Commissioner will be seen elsewhere.

CONCLUSION.

This report would be incomplete without an expression of appreciation of the hearty assistance rendered by the various officials of this Branch and of the careful and capable way in which they have carried on the work during the period your Horticulturist has been in charge. In every instance they have been covering extra territory besides working short-handed, so that the greatest credit is due them for the invaluable work they have rendered under the existing difficulties.

All of which is respectfully submitted.

M. S. MIDDLETON,
Provincial Horticulturist and Inspector of Fruit Pests.

ANNUAL REPORT OF ASSISTANT HORTICULTURIST AND INSPECTOR OF FRUIT PESTS FOR THE NORTHERN OKANAGAN, SHUSWAP LAKE, CANADIAN PACIFIC RAILWAY MAIN LINE SECTION EAST OF LYTTON, AND UPPER COLUMBIA VALLEY DISTRICTS.

P. E. FRENCH.

M. S. Middleton, Esq.,
Provincial Horticulturist and Inspector of Fruit Pests,
Department of Agriculture, Victoria, B.C.

SIR,—I beg to submit my annual report on the work in the above districts for the year 1917.

PACKING-SCHOOLS.

A large number of our fruit-packers have responded to the call for overseas service. This, coupled with prospects of an increased crop of fruit, made the packing situation appear rather serious for the 1917 season. On this account your assistant thought that the promoting of packing-schools was an important feature of the work during the early part of the year. The number of pupils who made application for instruction far exceeded expectation, and as a result

of schools held many 1917 pupils were found making good in fruit-packing houses during the past season. About 200 pupils were accommodated in the Vernon-Oyama District alone, a large percentage being girls and women.

PRUNING-SCHOOLS.

The call for pruning-schools was not as great as it has been formerly, on account of the large number of pupils accommodated the past few years and on account of the heavy enlistments from the fruit-growing sections.

Your assistant personally conducted one school for adults and one for high-school boys in the Vernon District.

CROP COMPETITIONS.

Two farm-garden competitions were held during the year, one under the Northern Okanagan Farmers' Institute at Grindrod and Mara, and one under the Nicola Farmers' Institute at Lower Nicola. Your assistant acted as judge of the former and C. R. Barlow of the latter. Great interest was taken by the competitors and keen rivalry shown. Some of the gardens were a credit to any district and showed that great pains had been taken. Scores and reports of these competitions have been submitted.

FARMERS' INSTITUTE AND OTHER MEETINGS.

During March lectures were given on horticultural subjects at Farmers' Institute meetings at Notch Hill, Salmon Arm, and Armstrong, and twice during the year at the Coldstream Fruit-growers' Association. Reports of these meetings have been submitted.

On June 4th your assistant attended the Spallumcheen Farmers' Institute annual picnic at Hullcar, Armstrong.

JUDGING AT EXHIBITIONS.

In September your assistant acted as judge of the fruit and vegetable sections of a Coast circuit of fairs. Separate reports of each fair, with marked prize-lists attached, were submitted at the close of each fair.

EXPERIMENTAL ORCHARDS.

The five-year agreement between the owner of the Windermere Experimental Orchard and the Government terminated last spring. Considerable replanting was necessary in the spring, and all injured trees were replaced by the Department with hardy varieties and the orchard left in good order for the owner. A separate report on this orchard is being forwarded. The other experimental and demonstration orchards have been turned over to the owners.

CROP STATISTICS.

At various seasons of the year estimates of crop yields and conditions were reported on, and at the end of the season statistics are forwarded regarding the total production of fruit and vegetables, the total amount of the manufactured products, etc. As this district has been considerably increased in area, the amount of time entailed in collecting these statistics has also increased.

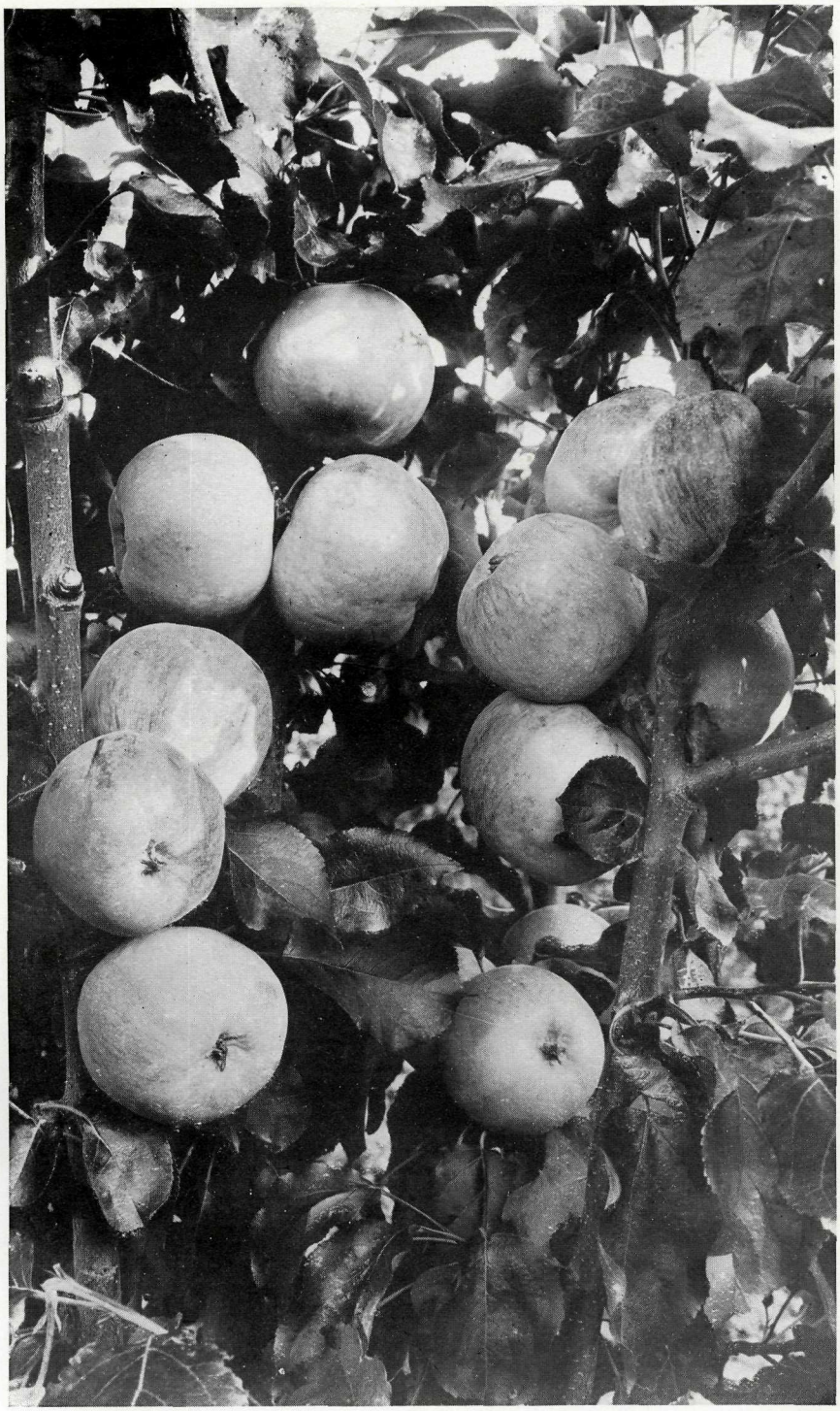
SURVEY-WORK.

In the winter months during weather which is not favourable for field-work, the local Inspectors have been filing and working out data from the orchard and truck-crop statistics collected in 1916. Considerable useful information can be obtained from these survey reports.

EXPERIMENTAL WORK.

Experimental work was again undertaken along much the same lines as last year. This included principally spraying experiments for the control of apple-scab and aphides with different spray mixtures and strengths of lime-sulphur. The experiments which were carried on in 1916 were duplicated this past season; the locality tests being conducted at Vernon and Salmon Arm and the material test at Salmon Arm.

Different strengths of lime-sulphur were tested at Vernon for the control of apple-scab, and different spray materials were tested for the control of aphides.



British Columbia apples are superior in quality.

Fruit-packing school, 1917.

Fruit packed by packing-school class at Vernon, 1917.

The following is a summary of these experiments:—

(*A.*) *Locality Experiment.*—Conducted on the same plots as in 1916, both at Salmon Arm and Vernon. Variety, McIntosh Red. Trees eleven and thirteen years old, former at Salmon Arm.

Time of Spray.	Plot 1.	Plot 2.	Plot 3.	Plot 4.	Plot 5.	Plot 6.	Plot 7.
Delayed dormant	L.S. 1-25	L.S. 1-25	...	...	...	...	Check.
Pink	L.S. 1-30	...	L.S. 1-30	L.S. 1-30	L.S. 1-30	L.S. 1-30	,,
Calyx	L.S. 1-35	L.S. 1-35	L.S. 1-35	L.S. 1-35	L.S. 1-35	L.S. 1-35	,,
10-14 days later	L.S. 1-35	L.S. 1-35	L.S. 1-35	L.S. 1-35	...	...	,,
10-14 days later	L.S. 1-35	L.S. 1-35	L.S. 1-35	...	...	L.S. 1-35	,,

Arsenate of lead, 2 lb. to 40 gallons, was added for the calyx spray on all plots.

In making the final count, all the apples on certain uniform trees in each plot were carefully examined and notes taken on the scab.

Result of Locality Experiment at Salmon Arm (Average for Two Years).

Plot.	Fruit free from Scab.	Scabbed but Marketable.	Total Marketable.	Culls on Account of Scab.
	Per Cent.	Per Cent.	Per Cent.	Per Cent.
1	99.03	0.97	100.0	None.
2	97.23	1.95	99.18	0.82
3	95.33	4.04	99.37	0.63
4	82.93	16.25	99.18	0.82
5	43.63	47.37	91.0	9.0
6	92.5	7.05	99.55	0.45
7	0.75	29.85	30.6	69.40

From these results it can easily be seen that Salmon Arm fruit can be produced free from scab, even those varieties which are very susceptible to the disease. In 1916 three sprayings, as per Plot No. 6, gave the most economical results, but in 1917 the three sprayings, pink, calyx, and four weeks later, gave the best results for the money expended.

Result of Locality Experiment at Vernon.—At Vernon, Plot No. 8 was added the past season, and on this only two sprays were applied—the calyx and one two weeks later—both with lime-sulphur 1-35. The following results are the averages for the two years except in the case of Plot No. 8:—

Plot.	Fruit free from Scab.	Scabbed but Marketable.	Total Marketable.	Culls on Account of Scab.
	Per Cent.	Per Cent.	Per Cent.	Per Cent.
1	99.89	0.11	100.0	None.
2	99.78	0.11	99.89	0.11
3	99.59	0.26	99.85	0.15
4	99.38	0.42	99.80	0.20
5	96.90	1.04	97.94	2.06
6	98.90	0.86	99.76	0.24
7	67.05	15.77	82.82	17.18
8	99.20	0.45	99.65	0.35

According to these results, apples in the Vernon District can be produced commercially free from scab by the application of two sprays, the calyx spray and one in two to four weeks later, depending on the weather conditions. From results obtained it is quite evident that the calyx spray is the most important.

(*B.*) *Materials Test.*—Lime-sulphur; atomic sulphur; Bordeaux mixture. This test was conducted on McIntosh apples at Salmon Arm on the same trees as in 1916.

Spraying.	Plot 1.	Plot 2.	Plot 3.	Plot 4.	Plot 5.	Plot 6.
Pink	L.S. 1-30	A.S. 6-40	L.S. 1-30	L.S. 1-30	B.M. 4-4-40	Check.
Calyx	L.S. 1-35	A.S. 6-40	A.S. 6-40	L.S. 1-35	B.M. 4-4-40	,,
3-4 weeks later	L.S. 1-35	A.S. 5-40	A.S. 5-40	A.S. 5-40	B.M. 4-4-40	,,

L.S.—Lime-sulphur. A.S.—Atomic sulphur. B.M.—Bordeaux mixture.

Arsenate of lead, 2 lb. per 40 gallons of the spray mixture, was added to all calyx sprays in this test.

Result (Average of Two Years, 1916 and 1917).

Plot.	Fruit free from Scab.	Scabbed but Marketable.	Total Marketable.	Culls on Account of Scab.
	Per Cent.	Per Cent.	Per Cent.	Per Cent.
1	89.13	9.5	98.63	1.37
2	46.20	37.64	83.84	16.16
3	54.35	35.07	89.42	10.58
4	81.74	16.80	98.54	1.46
5	83.95	13.40	97.35	2.65
6	0.75	29.85	30.60	69.40

Plot No. 5, which was sprayed with Bordeaux mixture, had 40 per cent. of the fruit russeted on account of burning. This russeting lowered the grade of this amount to No. 2 and No. 3 apples.

From the above results it will be noticed that the lime-sulphur spray gave the best results right through the experiment.

A field-day was held to show the growers over these plots, and great interest was taken by them in the results obtained.

There was practically no difference in the amount of fruit taken from the lime-sulphur and Bordeaux-mixture plots. The atomic-sulphur plot yielded about 80 per cent. of the amount taken from each of the other two plots. This decrease was undoubtedly due to the damage done by scab and not to the set of fruit.

(*C.*) *Experiment to test Different Strengths of Lime-sulphur in the Control of Apple-scab.*—Conducted at Vernon on McIntosh apple-trees thirteen years old.

Spray.	Plot 1.	Plot 2.	Plot 3.	Plot 4.
Pink	L.S. 1-30	L.S. 1-35	L.S. 1-40	L.S. 1-40
Calyx	L.S. 1-35	L.S. 1-40	L.S. 1-45	L.S. 1-50
10-14 days later	L.S. 1-35	L.S. 1-45	L.S. 1-45	L.S. 1-50

Result.

Plot.	Fruit free from Scab.	Scabbed but Marketable.	Total Marketable.	Culls on Account of Scab.
	Per Cent.	Per Cent.	Per Cent.	Per Cent.
1	99.88	0.04	99.92	0.08
2	99.55	0.28	99.83	0.17
3	99.56	0.30	99.86	0.14
4	99.36	0.34	99.70	0.30

In this case the weaker strengths of lime-sulphur have given practically the same results as the stronger ones which have been usually applied. It is hoped that this experiment will be carried on again in 1918, because results show that a great saving can be effected in the cost of the spraying.

A separate report will be forwarded on the experimental work in regard to the control of aphides. The results should be carried on another year before being published.

PEST-INSPECTION WORK.

On March 31st R. J. Kyte resigned the position of local Inspector for the Vernon-Armstrong District, and on April 9th H. H. Evans was appointed as his successor. C. R. Barlow has again acted as Inspector for Salmon Arm District and Canadian Pacific Railway main-line points. The very satisfactory manner in which these gentlemen performed their duties is hereby acknowledged.

INSPECTION OF EXPORT FRUIT AND VEGETABLES.

During the shipping season all export fruit and vegetables were inspected and certificates issued. This required constant attention, although the shipments were not as heavy as usual, due principally to the embargo put on by Great Britain and Australia. Generally speaking, the quality was very good and the fruit free from disease. In a few cases portions of the car had to be condemned on account of apple-scab, lesser apple-worm, or water-core.

INSPECTION OF EMPTY CARS.

To guard against the possibility of codling-moth infection, empty railway-cars were again inspected the past season. The Canadian Pacific Railway had all foreign cars collected at Okanagan Landing for icing and inspection purposes.

The greatest danger from infection from codling-moth is undoubtedly from foreign cars which come up from codling-moth-infested areas in Washington, Oregon, and other States. In one car no fewer than fourteen healthy full-grown codling-moth larvæ were discovered in the cracks. In four others live larvæ or pupæ were found.

On arrival at Okanagan Landing all foreign cars were immediately inspected, all rubbish cleaned out and burned, and the car iced several hours before being forwarded to Vernon for loading. Where a car was found to be infested it was immediately iced, ventilators and doors closed, and the car sent out either empty or loaded with fruit right at the landing for shipment to the Prairies.

Eighty-seven foreign cars and a large number of Canadian Pacific Railway cars were inspected in this way during the season.

The Canadian Pacific Railway agent at Okanagan Landing and the freight agent at Vernon assisted in every way possible to get the inspection-work and icing done promptly.

INSPECTION OF NURSERIES.

The various nurseries in this district were inspected several times during the growing season and the trees examined carefully at digging-time. A percentage of the stock was condemned for crown-gall, hairy root, or winter injury, these being the three main troubles. Separate reports on each nursery have been submitted.

FIELD-WORK.

The staff of Inspectors is hardly adequate to make as thorough systematic inspections as might be desired under normal conditions. However, under the present war conditions every one realizes that it is only the most necessary work that is to be carried on. This has been the case in the work in this district, and expenses have been kept down as low as possible consistent with efficiency.

Aphides.—Green aphides have not been very troublesome during the past season. Woolly aphides, however, are certainly getting a strong foothold in some parts of the valley, and growers should see to it that more thorough control measures are practised.

Apple-scab.—This disease has not caused as much damage to fruit in the past season as in 1916. This is partly due to the season and partly to the more efficient methods of control practised by the growers.

Oyster-shell Scale.—This insect is not a very serious pest in the well-managed orchards. It is noticed mainly in the neglected and old orchards.

Fire-blight.—This disease is scattered here and there throughout the Vernon and Armstrong Districts. In a few cases the disease is well established, but, generally speaking, it is mostly scattered on odd limbs on such varieties as the Spitzenberg. The extreme shortage of labour has made it very hard for the average grower to keep the blight under control. Mr. Evans has the various infections fairly well located, and it is the aim of your assistant to clean this up during the present dormant season.

The Oyama growers have the blight well under control in that district.

In the Shuswap Lake districts a few infections occurred throughout the season, but Mr. Barlow has these well under control. An inspection will be made for any hold-over cankers during the dormant season.

San Jose Scale.—The orchards at Spences Bridge, where a bad infection of this pest had occurred, have been cleaned up, and no San Jose scale was found during the past season on the fruit-trees or fruit. New infections were, however, found on some wild growth of choke-cherry, willow, and maple, and these are being attended to.

Codling-moth.—The codling-moth quarantine area at Okanagan Landing required very close attention again the past season, and I am pleased to report the satisfactory progress which was made. The worms were reduced to about 10 per cent. of the number captured in 1916, and the infested area was cut in half. The fruit was very small in this infested area on account of the dry season and lack of irrigation. This caused more work in the inspection and eradication methods employed than there otherwise would have been. Eight band inspections were made. All the quarantined area was sprayed thoroughly twice, and the portion where codling-moths were showing up this season was sprayed three times. The rough bark was scraped off the trees, all wormy fruit and culls were destroyed by boiling, and the good fruit, after close inspection, was shipped to the Prairie Provinces.

About 65 acres of orchards were put under quarantine at Walhachin on account of the codling-moth discovered there in the fall of 1916. Methods of eradication employed here were similar to those practised at Okanagan Landing. Very thorough work was done by Mr. Buckell, who was in charge of this work at Walhachin for the season, and I feel sure that the results of work done will be shown by the very small emergence of the pest next season. The growers at Walhachin co-operated with the Department in every way possible to eradicate the pest.

No evidence of codling-moth was discovered in the Kamloops District during 1917. Mr. Barlow has had instructions to keep a close watch on this district for any recurrence of this insect.

GENERAL.

Many calls have come in for general orchard visits and demonstrations, and considerable time is taken up with this line of work, which is always popular.

The volume of office-work has steadily increased and necessarily had to be attended to. This was especially true since the inspection-work was turned over to the Horticultural Branch.

All of which is respectfully submitted.

P. E. FRENCH,
Assistant Horticulturist and Inspector of Fruit Pests.

ANNUAL REPORT OF ASSISTANT HORTICULTURIST, SOUTH OKANAGAN AND SIMILKAMEEN DISTRICTS.

B. HOY.

M. S. Middleton, Esq.,
Provincial Horticulturist and Inspector of Fruit Pests,
Department of Agriculture, Victoria, B.C.

SIR,—I herewith submit my annual report as Assistant Horticulturist for the South Okanagan and Similkameen for the year 1917.

MEETINGS AND FALL FAIRS.

Lectures on horticultural subjects were given at the following meetings: Glenmore (two), Ellison, Rutland, Benvoulin, Westbank (two), and Peachland.

Fall fairs were attended in the capacity of judge of fruit and vegetables at Nanaimo, Lasqueti Island, Denman Island, Duncan, Saltspring Island, Central Park, Ladysmith, Parksville, Courtenay, Alberni, Summerland, and the Home Products Exhibition, Victoria. A report on this work has been submitted.

PRUNING-SCHOOLS.

Pruning-schools were organized and instruction given at Westbank, Naramata, and Kelowna.

SHORT COURSE IN AGRICULTURE.

A two weeks' short course in agriculture was organized and held at Summerland. The horticultural lectures were given by your assistant and the Horticulturist for the Kootenay District.

EXPERIMENTAL WORK.

Experimental spraying was conducted this year on apple-scab and woolly aphis at Kelowna, and peach-mildew, leaf-curl, and twig-borer at Summerland.

At Kelowna work was done in the control of grasshoppers, also in the control of wireworms and cutworms in onions.

Apple-scab.—In these experiments the following sprays gave 95 per cent. clean fruit: Lime-sulphur 1-30 when the blossom-buds were pink; lime-sulphur 1-35 when the petals had just fallen and 1-35 two weeks later. On the unsprayed plot there was 70 per cent. clean fruit.

Following are the results of apple-scab experiments at Kelowna, 1917, showing the benefits of certain sprays (lime-sulphur used in all sprays):—

Plot 1: Unsprayed; 30 per cent. scab.

Plot 2: Sprayed once, May 10th; 20 per cent. scab.

Plot 3: Sprayed twice, May 10th, 1-30, and May 30th, 1-40; 5 per cent. scab.

Plot 4: Sprayed three times, May 10th, 1-30; May 30th, 1-40; and June 12th, 1-35; 5 per cent. scab.

Plot 5: Sprayed five times, May 10th, 1-30; May 17th, 1-30; May 30th, 1-40; June 12th, 1-35; and June 25th, 1-40. Practically free, about same as where sprayed four times.

Plot 6: Same as above, only sprayed six times, the first spray being put on May 2nd. Results same as where only sprayed four times.

Main orchard: This was sprayed the same as Plot No. 4 and again on June 25th, and was commercially free of scab. From the above results it would seem that the pink, calyx, and one later spray thoroughly applied would control scab in any normal season.

Woolly Aphis.—In these experiments several sprays were tried, but the regular formula of Black Leaf 40 and soap gave as satisfactory results as any. In this experiment it was found that thoroughness of the work was the chief factor, and that even then only a small percentage of the aphides were killed with one spray. High pressure and thoroughness are very essential in controlling this pest.

Peach-mildew and Leaf-curl.—Owing to the climatic conditions these diseases did not become prevalent enough to show any difference between the check-plots and the sprayed plots.

Peach-twig Borer.—In this experiment arsenate of lead and lime-sulphur were used. The best results were obtained with lime-sulphur 1-9 when the buds were swelling. On the trees sprayed there was 92.4 per cent. clean fruit and on the unsprayed plots only 49 per cent. A detailed report of this work has been submitted.

Grasshoppers and Wireworms.—A detailed report of these experiments has been submitted to the Department. The so-called Kansas mixture gave excellent results in grasshopper-control, and the mixture, 10 lb. of rice, bran, and one cup molasses, with enough water to make into a dough, made a splendid trap for catching wireworms. Small balls of this mixture were buried about 3 inches deep at intervals of 10 or 12 feet in the infected soil of the field. These were marked and the balls taken up and worms removed every three or four days during the early part of the season. T. W. S. Taylor gathered over 50,000 worms from less than one acre in one day by this method.

CROP COMPETITIONS.

A competition in onion-growing was held in the Kelowna District. There were fifteen competitors, and in nearly all cases much interest was shown. These plots were judged by your assistant three times during the season.

ORCHARD-SURVEY WORK.

The 1916 and 1917 orchard-survey reports are being compiled, and this survey is being followed by another at the present time to get new plantings and an accurate record of the condition of each orchard.

Besides this, a special peach and apricot survey is being made for the purpose of outlining a plan of control for the peach-twig borer, which is becoming more prevalent each year and a menace to the peach and apricot industry.

CODLING-MOTH CONTROL.

In 1917 this work at Kelowna was dropped and no new outbreaks were found. At Westbank the work was carried on similar to last year, with the exception that a third spray was applied and the bands were inspected seven times instead of five. In all, forty-eight worms were found and ten punctured apples. This year there was an increase of 6,000 boxes of apples, making a total of 18,000 and a decrease of over 80 per cent. in the number of worms found as compared with 1916.

FIRE-BLIGHT INSPECTION.

This work is being carried on as in previous years. In the early spring of 1917 there was considerable blossom-blight, but only a few cases of severe infection. Owing to the great shortage in labour it is becoming more difficult each year to get efficient men to do the cutting-out of this disease.

INSPECTION OF FRUIT.

Apples for export were inspected at Kelowna and certificates issued to the shippers throughout the district. Besides the export shipments, a great deal of fruit was inspected for growers at their request during the shipping season. All packing-houses were visited from time to time throughout the year in order to locate any new diseases or insects that might find their way into the district.

VEGETABLE INSPECTION.

No potatoes for export left this district this year, but several cars of onions, potatoes, carrots, etc., were inspected in order to advise on the condition of produce for shipping.

GENERAL WORK OF BRANCH.

Work along the same lines as in previous years was conducted this year. Many requests came in from growers in various parts of the district, who wished advice on certain operations, and a great many visits were made to various places for this purpose. Office duties have been increasing each year, and much time is taken up answering inquiries and interviewing growers in the office.

Respectfully submitted.

B. HOY,
Assistant Horticulturist.

ANNUAL REPORT OF ASSISTANT HORTICULTURIST AND INSPECTOR OF FRUIT PESTS, VANCOUVER ISLAND AND LOWER MAINLAND DISTRICTS.

E. W. WHITE.

M. S. Middleton, Esq.,
Provincial Horticulturist and Inspector of Fruit Pests,
Department of Agriculture, Victoria, B.C.

SIR,—I beg to submit herewith my annual report as Assistant Horticulturist and Inspector of Fruit Pests for Vancouver Island and the Lower Mainland for the year 1917.

CHANGE IN POSITION.

From January 1st to June 2nd, your assistant occupied the position of District Fruit Pest Inspector for Vancouver Island and the Gulf Islands, being attached to the temporary staff. On June 2nd H. Thornber, Assistant Horticulturist and Inspector of Fruit Pests for the Kamloops District, with headquarters in Victoria, and acting in the same capacity for the Lower Mainland and Vancouver Island, in place of W. H. Robertson, on active service, resigned his position with the Department to accept a more lucrative position in Montana.

Following instructions from R. M. Winslow, then Provincial Horticulturist and Inspector of Fruit Pests, your assistant on June 4th assumed the duties relinquished by Mr. Thornber and was gazetted to the permanent staff as Assistant Horticulturist as from June 1st.

CONTINUATION OF THE PEAR-THRIPS WORK IN SAANICH.

The pear-thrips work which was begun in 1916, and on which a full report has been given, was continued during 1917 on practically the same basis, but with a few minor changes.

R. C. Treherne and Dr. A. E. Cameron, Field Officers for the Dominion Entomological Branch in British Columbia, again had charge of the investigational and life-history work, while your assistant was again detailed to take charge of the spraying operations for the Provincial Department. The major portion of the months of March, April, May, and June were occupied on this work.

As in 1916, this Department again supplied the three power-sprayers free of charge to the growers in the districts where the investigations were being carried on, and under the same agreement, with the exception that no paid engineer was put in charge of each machine.

Machine No. 1 remained in the orchard of T. A. Brydon & Son, Royal Oak, and was operated by J. M. Brydon.

Machine No. 2 was again operated in the orchards of Stewart Bros., Tanner Bros., J. H. Sutton, and A. E. Gale, and was in personal charge of the writer during the season.

Machine No. 3, located in the Gordon Head section, was not operated by the Department owing to the slightness of the pear-thrips infection in that district, but permission was given to a number of growers to use the machine in their own interests, on the understanding that it be returned in the same condition in which it was received. A. E. Cameron, of Gordon Head, had supervision over the machine.

No special attempt was made to sell spray material at the different centres in 1917, but the material held over from last year was disposed of to the growers who applied for it.

Three general spray applications were again made this year, as follows: The first, just as the buds were bursting in the spring, which is coincident with the emergence of the thrips; the second, just as the blossom-clusters were showing pink, which corresponds to the maximum egg-laying period; and the third, just as the blossoms were falling, to control the larvæ.

Owing to the prevalence of apple-scab in the orchards sprayed for thrips in 1916, the formulæ were changed somewhat this year in an endeavour to control the scab. In 1916 the main object was to control the thrips, and the results were very satisfactory as far as they were concerned. This year an endeavour was made to control the scab as well as the thrips, and efforts were successful.

In 1917 the formula used for the first spraying was the same as in 1916, being the remedy recommended by the New York authorities, and was as follows (United States measurements): Nicotine sulphate (Black Leaf 40), 1½ pints; whale-oil soap, 10 lb.; water, 200 gallons.

Miscible Oil No. 2, prepared by the Balfour-Guthrie Company, of San Francisco, which has been used extensively in California on pear-thrips work, was again used experimentally in 1917 for the first spraying in the following proportion (United States measurements): Miscible Oil No. 2, 5 gallons; nicotine sulphate (Black Leaf 40), 1 pint; water, 200 gallons.

This spray was used almost exclusively for the first application on pears, on which satisfactory results were not secured in 1916. The oil mixture is much more penetrating than the soap preparation, and the results were very promising, but the control of the thrips on pears will need further consideration in 1918.

For the second and third general sprayings in 1917 the following formula was used instead of the soap mixture used the previous year (United States measurements): Nicotine sulphate (Black Leaf 40), 1½ pints; lime-sulphur solution, 4 gallons; arsenate of lead, 8 lb.; water, 200 gallons.

It will be seen that in an endeavour to control the scab the spreading properties of the soap was sacrificed—so essential in the control of thrips—for the fungicidal value of lime-sulphur, which is equally valuable in the control of scab.

The general results were that, while the lime-sulphur did not have the same killing effect on the thrips, still they were held in check, and at the same time scab was controlled to a large extent. Arsenate of lead was added for the control of any leaf- or fruit-eating insect.

While the spring of 1916 was considered exceptionally backward, the season of 1917 was even worse in that respect. A comparison of the main spraying dates for the two years may be noted in the following:—

Pear-thrips Spraying.	1916.	1917.
First application, buds bursting	March 29 to April 8	April 9 to April 24.
Second application, blossoms pink	April 27 to May 3	May 4 to May 17.
Third application, blossoms falling	May 22 to May 29	June 4 to June 12.

A factor entering into the control of the pear-thrips was discovered during the present season, when it was found that, besides being a pest of deciduous fruit-trees, it had become thoroughly established on many other trees and shrubs on Vancouver Island, principal among which are the broad-leaved maple (*Acer macrophyllum*), June-berry (*Amelanchier florida*), willow (*Salix scouleriana*), red-flowering currant (*Ribes sanguineum*), choke-cherry (*Prunus demissa*), Nuttall's cherry (*Nuttalia cerasiformus*), and also incidentally on skunk-cabbage (*Lysichiton kamschetkense*), Douglas fir (*Pseudotsuga mucronata*), Oregon grape (*Berberis nervosa*), daisy (*Bellis perennis*), and dandelion (*Taraxacum officinale*). It was also found to occur on ornamental shrubs, such as *Andromeda floribunda*, *Viburnum opulenta*, and Japanese flowering plum.

In some cases in 1917 the injury caused to maples was even greater than that done to deciduous fruit-trees. In one case at Duncan twenty buds of a maple, on examination, yielded approximately 1,000 thrips.

It has been demonstrated that the species can successfully complete its life-history on the broad-leaved maple, the June-berry, choke-cherry, and Nuttall's cherry, causing damage exactly parallel to that which it commits on deciduous fruit-trees.

On an inspection tour conducted by Dr. A. E. Cameron and your assistant, the pear-thrips were found to exist as far north as Nanaimo and on some of the islands of the Gulf. R. C. Treherne, who made a thorough examination of the orchards of the Lower Mainland, failed to find the species located in that district.

After two years' investigation the life-history has been thoroughly worked out and the efficiency of the various control measures demonstrated. At the present time a bulletin is being prepared by Messrs. Treherne and Cameron on the pear-thrips, and it is hoped it will be available for distribution by March, 1918, so that the fruit-growers will have it as a reference for their spring campaign.

INSPECTION OF POTATOES FOR EXPORT.

During January, February, and March considerable time was occupied in the inspection of potatoes for export.

This export trade resulted from the shortage of the 1916 crop in the United States and the high prices offered local dealers for their stocks. Out of a large number of cars inspected only three passed for export. This small percentage was due to the fact that a number of the cars offered here for export were cars which had already been turned down by the Inspectors on the Lower Mainland earlier in the season. Another factor against export was due to the fact that none of the local stocks had been inspected in the field before being sent to the trade, and they were not selected with the idea of being exported.

During October several cars of Ashcroft potatoes were inspected, which had arrived in Victoria in very poor condition for that season of the year. These potatoes were intended for winter storage, but it was found necessary to sort them all over and to dispose of them as soon as possible.

PRUNING-SCHOOLS.

During the latter part of February and the first week of March two pruning-schools were conducted, one each at Rocky Point and Metchosin. The attendance was well up to the average and a great deal of interest was shown. There are a number of young orchards in these districts which need attention. The weather was very unfavourable.

HATZIC EXPERIMENTAL STRAWBERRY-PLOT.

This plot was operated under rather unfavourable conditions in 1917; Mr. Thornber, who had charge of the work, having resigned just at the beginning of the strawberry season.

It was found very difficult to secure suitable help during the shipping season owing to the great labour shortage; also owing to the rush of other work personal attention could not be given. However, the crop was harvested, records kept, and disposition effected to the best advantage.

As the lease for this plot expired at the end of the 1917 season and it was not possible to secure the results desired, it was decided to discontinue the plot.

HORTICULTURAL COMPETITIONS.

During the summer your assistant was called upon to judge at all of the competitions held in his district; in fact, a greater portion of the time during July and August was spent on this work.

Keen interest was taken in all the competitions, especially those which were held for the first time in 1917. These competitions do a great deal to stimulate interest and better care in the lines in which they are held.

At this time when "Increased Production" is the slogan, the city-garden competitions, arranged with that idea in mind, were especially interesting. In Victoria four different competitions were held, in which ten prizes ranging from $10 to $1 were awarded in each. Although the Department only made the one $35 grant for the four competitions, this was added to by J. H. Todd, of Victoria, by the very generous gift of $200.

The following is a list of the competitions judged and the number of entries in each:—

Place.	Competition.	No. of Entries.
Victoria	City garden, No. 1	33
Victoria	Vacant lot, 3,000 to 6,000 square feet, No. 3	26
Victoria	Vacant lot, 6,000 to 20,000 square feet, No. 4	8
Victoria	Boys and girls under seventeen years, No. 5	12
Ward 2, Saanich	Cottage garden	23
North Vancouver	City garden	17
Metchosin	Farm garden	18
Sooke	Farm garden	10
Gordon Head	Strawberry	7
Keating	Strawberry	9
Hammond	Strawberry	7
Hammond	Raspberry	7

FALL FAIRS.

The following fall fairs were attended by your assistant, in the capacity of judge of fruit and vegetables, at the following places: North Vancouver, Cranbrook, Fruitvale, Trail, Nelson, Rossland, Grand Forks, Cobble Hill, and North and South Saanich.

At North Vancouver, Nelson, and Rossland assistance was rendered to Professor F. M. Clement, of the University of British Columbia, who had charge of the judging, and at Cobble Hill and North and South Saanich the same assistance was rendered to the Provincial Horticulturist.

On the whole, the number of entries were much fewer than in previous years. This falling-off is due to two main facts, which apply generally to all the fairs concerned: First, the absence at the front of so many producers and former exhibitors; and, secondly, the great shortage and high price of labour, which made it almost impossible for the men and women who were left on the farms to take the time to prepare a creditable exhibit.

In general, the management of the fairs have been just carrying on and doing the very best they could while the war lasts, but as soon as normal times return they expect to be able to bring their fairs back to the former standard of excellence to which they had attained.

EXPERIMENTAL FALL SPRAYING WITH BORDEAUX MIXTURE.

This work, which was begun in 1916 in conjunction with J. W. Eastham, Plant Pathologist, to determine the efficiency of Bordeaux mixture (3-4-40) spray in September while the fruit was still on the trees, to control anthracnose, was continued in 1917. Very satisfactory results were obtained, as shown by the counts made in the spring of 1917. A full report on this work will be submitted by Mr. Eastham.

INSPECTION OF NURSERIES.

Owing to the shortage of help in the Department and the rush of other work, it was found impossible to make a thorough summer inspection of the nurseries. A complete inspection was, however, made in the fall at digging-time.

The following nurseries in the Lower Mainland District were visited and inspected: British Columbia Nurseries Co., Ltd., Sardis; Fraser Valley Nurseries, Aldergrove; J. H. Dean, "Roseland Nursery," Aldergrove; Charles H. Provan, Langley Fort; David Spencer, Ltd., Hastings Street, Vancouver; Dominion Nursery Co., 2184 Fourth Avenue West, Vancouver; Gladstone Nurseries, Gladstone; T. Topham, 946 Fifteenth Avenue East, Vancouver; R. J. Taylor, 2456 Main Street, Vancouver; Keeler's Nursery, 145 Fifteenth Avenue East, Vancouver; R. T. Copley, Nanaimo Road, corner Fifteenth Avenue, Vancouver; A. R. McDougall, 524 Kingsway, Vancouver; Nonus H. Abray, Thirty-fourth Avenue and Prince Edward Street, South Vancouver; Foster & Buzzard, Eburne; R. D. Rorison, Royal Nurseries, 207 Hastings Street West, Vancouver; Royal Nurseries, Bridgeport; Brown Bros. & Co., Ltd., 48 Hastings Street East, Vancouver; Garden City Nursery, Lulu Island, Eburne; Granville Nurseries, P.O. Box 343, Kerrisdale; West End Nurseries, 732 Granville Street, Vancouver; Great West Nurseries, Seventeenth Street and St. Andrews, North Vancouver; J. G. Speller & Co., 2000 Larsen Road, North Vancouver; North Vancouver Nursery, Seventeenth Street East, North Vancouver; William Livingstone, Twelfth and Lonsdale, North Vancouver.

The Vancouver Island nurseries visited and inspected were as follows: A. Ohlson, Oakland Nursery, 1580 Hillside Avenue, Victoria; G. A. Knight, Mount Tolmie Nursery, Mount Tolmie P.O.; Quadra Greenhouses, North Quadra Street, Victoria; R. Layritz, Layritz Nurseries, Colquitz P.O., Victoria; Brown's Victoria Nurseries, Esquimalt Road, Victoria; John Barron, Glanford Avenue Nurseries, Victoria.

The nursery business has been more or less stagnant for the past few years, and the stocks at the various nurseries have become very low. However, there are indications at the present time that there will be quite a revival of planting in 1918.

The Layritz Nurseries and the British Columbia Nurseries Company, Limited, are the only firms which have been propagating any considerable amount of new stock. The latter firm dug their own stock from their nursery at Sardis for the first time this year; the stock was in excellent condition. A full report has been submitted on the Nurseries.

INSECT PESTS AND DISEASES.

The black-currant bud-mite infection in the Duncan District was again very carefully handled by R. Glendenning, of Duncan, who had charge of the work in 1916. The amount of infection was very greatly reduced over the previous year. Mr. Glendenning has submitted a full report.

The strawberry-root weevil again caused considerable damage in the Gordon Head, Keating, and Lower Mainland Districts, but growers are adopting the remedies recommended by the Department and feel confident in their ability to check its ravages.

The codling-moth on Vancouver Island was of necessity left to itself in 1917, as it was impossible to do any work on it owing to the pressure of other duties. It is the opinion of your assistant, however, that this pest has reached almost a negligible stage.

Cutworms were a very serious menance to growers of garden-truck and field crops, and caused a great deal of damage while they were active.

Other common insects were of about the same severity as usual and did not cause undue damage.

Late blight of potatoes was very serious in the Chilliwack and Agassiz Districts in the fall of the year. Growers will of necessity have to adopt stringent control measures in the very near future or go out of the potato business. One 14-ton pit in the Chilliwack District, opened up just three weeks after the potatoes were dug, showed over 50 per cent. shrinkage from blight.

Apple-scab was not as severe as usual, and there was a considerable quantity of clean fruit. Where proper remedial measures were adopted the percentage of clean fruit was high.

Other diseases did about the same damage as usual, but there is an increasing amount of potato-diseases which need careful attention in the future.

DEMONSTRATIONS AND GENERAL WORK.

A large number of demonstrations in the various branches of horticultural science were given in all parts of the district during the year, and many personal calls were given to persons inquiring for information. This line of work takes up an increasing amount of time and is much appreciated by growers.

CROP REPORTS.

Considerable time was spent each month during the summer and fall in gathering crop statistics for Mr. A. B. Tweddle, Statistician. However, no detailed survey-work was undertaken.

FRUIT AND VEGETABLE PRODUCTION.

Climatic conditions were not as favourable as they might have been. A very late spring was followed by an exceedingly dry summer. The fall of the year was exceptionally open, and the apple and pear crop was gathered in excellent condition and much fall work on the land was possible.

On Vancouver Island the strawberry-crop was small, as a late season always means a short crop. It is customary to have the first strawberries on the market on May 24th, but in 1917 it was June 21st before they were offered for sale. The exceedingly hot, dry weather prevalent the first part of July dried this crop up very fast, and, whereas the season usually extends for a period of six weeks, in 1917 it was limited to slightly over three.

The one redeeming feature was the fact that the price was good, and the Gordon Head and Keating Fruit-growers' Associations jointly shipped twenty-two cars, amounting approximately to 17,600 crates, to the Prairies, besides disposing of approximately 150 tons of jam-berries.

The tree-fruit crop was an average one and good prices prevailed in the early part of the season. Olivet-cherry growers received an exceptionally good price for their crop this year.

Potatoes showed a very marked increase in acreage, amounting to almost 25 per cent., but the very late spring and dry summer mitigated against a big crop, and the average yield per acre fell considerably below 1916, making the total tonnage about the same as in 1916.

Vegetable-crops varied greatly, but had a tendency to run light. Fall crops did well.

On the Lower Mainland the raspberry-growers were favoured with much better climatic conditions than in 1916 and were able to ship a great proportion of their crop. The price realized on the Prairie markets was very satisfactory. The canneries took care of a good proportion of the crop at very reasonable prices.

Tree-fruits in this district were not a heavy crop, and the late season and wet weather at blossoming-time seem to have had a very detrimental effect on pollonization. The absence of bees at that period was also very noticeable.

The potato-crop varied greatly, but on the whole it was an average one. Some yields were exceptionally heavy, while others were exactly the reverse. In the Chilliwack District late blight was very severe at digging-time and caused a great deal of shrinkage in marketable stock.

Other vegetable and truck crops were average on the low lands, but suffered from drought on the benches.

OFFICE WORK AND CORRESPONDENCE.

It was necessary to spend an increasing amount of time in the office owing to Mr. Thornber's resignation, and the correspondence assumed increased very considerably.

All of which is respectfully submitted.

E. W. WHITE,
Assistant Horticulturist and Inspector of Fruit Pests.

ANNUAL REPORT OF ASSISTANT HORTICULTURIST, KOOTENAY AND BOUNDARY DISTRICTS.

E. C. HUNT.

M. S. Middleton, Esq.,
Provincial Horticulturist and Inspector of Fruit Pests,
Department of Agriculture, Victoria, B.C.

SIR,—I have the honour to submit herewith my annual report on the work carried on in the Kootenay and Boundary Districts for the year 1917.

The work of the Horticultural Branch in this district included the conducting of packing and pruning schools, horticultural competitions, spraying experiments, supervising the demonstration and experimental orchards, judging fairs, general inspection-work, and personal visits to orchards.

PACKING AND PRUNING SCHOOLS.

During the early part of the year seven packing-schools and one pruning-school were held in this district. The packing-schools were held at the following places: Three at Grand Forks, three at Creston, and one at Passmore. Four of these schools—two at Grand Forks and two at Creston—were held for the boys and girls attending the public and high schools. The only pruning-school held was at New Denver. As a whole, the schools were well attended and a good deal of interest shown by the pupils taking part. A full report of each school was sent in to the Department at the time the schools were held.

HORTICULTURAL COMPETITIONS.

In 1917 there were held in this district by the Department twelve horticultural competitions of various kinds, at the following places: Three city-garden competitions, one at Natal and two at Nelson; seven farm-garden competitions, one each at Robson, Needles, Baynes Lake, Crawford Bay, Willow Point, Wynndel, and Harrop; and two bearing-orchard competitions, one each at Grand Forks and Willow Point. These competitions were judged from two to three times during the season. The details of the scores in connection with these have been submitted. A very keen and friendly rivalry has been created by this work among the farmers where these competitions have been held. The results have been that greater areas have been cultivated and made to produce good crops by careful tillage and management of the soil.

SPRAYING EXPERIMENTS.

Spraying experiments and demonstration-work for the control of apple-scab in this district were started in 1916 at Nelson and Creston, while in 1917 a similar experiment was started at Mr. Forslund's, on the Arrow Lakes. Each of these experiments are to be carried on for at least three years on the same plots, using the same material (lime-sulphur) each year. The results obtained this year were on the whole very successful, although not so good at Nelson as

in 1916. A full report of the work done and the results obtained from each of the experiments has been submitted. There has been a big improvement in the quality of the apples this year over that of 1916, due to the very satisfactory results obtained, both this year and last, from these experiments, and to the fact that growers of the district have made special efforts to control the scab by a thorough application of the sprays recommended by the Department.

DEMONSTRATION AND EXPERIMENTAL ORCHARDS.

At present there are five demonstration and experimental orchards in this district. These orchards are located at Rossland, Birchbank, New Denver, Wardner, and Waldo. These were pruned in the spring, and considerable replanting was done at Waldo, Wardner, and Rossland. Some hardier, shorter-seasoned varieties were planted in place of the more tender sorts. On the whole, most of the orchards have done well, in spite of the very dry and hot summer that was experienced during the season. A separate report dealing with the operations carried on at each orchard for the year has been submitted.

FAIRS.

Fall fairs were judged during September and October at Kelowna, Heffley Creek, Armstrong, Needles, Burton, Nakusp, and Rock Creek. A report on each fair has been submitted to the Department.

INSPECTION-WORK.

This work for the year, as far as time would permit, consisted of orchard, potato, and nursery inspection in the various sections. The fruit pests, other than apple-scab and fire-blight, have been very scarce this year. The vegetable-growers have had considerable trouble with the cabbage, turnip, and onion maggots, cutworms, and the green cabbage-worm. The main potato-diseases have been scab, *Rhizoctonia*, and *Fusarium* wilt. In the Boundary section fire-blight has been quite bad again in some of the orchards, while in the Kootenay section apple-scab has been by far the worst disease to deal with. Fire-blight did not show up anywhere in the Kootenay in 1917. The nursery stock of the Riverside Nurseries, of Grand Forks, was inspected in October and a full report submitted.

CROPS.

On the whole, nearly all fruit-crops of the district were light. The potato-crop was also light, while other vegetable-crops were about normal. Prices growers received this year for their fruit and vegetables have been very satisfactory. About 50 per cent. of the apple-crop in the district graded up to No. 1, which is quite an increase in this grade over that of 1916.

All of which is respectfully submitted.

E. C. HUNT,
Assistant Horticulturist.

REPORT OF ACTING ASSISTANT HORTICULTURIST, PRINCE RUPERT DISTRICT, FOR THE MONTHS OF JANUARY TO MARCH, 1917.

A. R. NEALE.

M. S. Middleton, Esq.,
Provincial Horticulturist and Inspector of Fruit Pests,
Department of Agriculture, Victoria, B.C.

SIR,—I beg to submit herewith my report on the work in the above district during the first three months of 1917.

It being the winter season, the ground covered by your representative was of necessity very small, and the greater portion of the time was devoted to office-work.

INSTITUTE MEETINGS.

Early in January your assistant attended a meeting of the Farmers' Institute at Cedarvale, where there was a fair attendance and the subject discussed was "Small Fruits." An attempt was made to organize a short course at Terrace, but owing to extensive logging operations which were being carried on this had to be abandoned.

During February a visit was made to Bella Coola and two very well-attended meetings were addressed. The subjects treated were "Co-operation" and "Better Farming Methods as applied to Local Conditions." As a result of these meetings it is gratifying to note that a local Farmers' Exchange has been organized, and it is hoped, with this and the new spirit which has sprung up in this district, that the disadvantages of isolation will be greatly overcome.

OFFICE-WORK.

During the three months prior to vacating the office, the annual reports, preparation of a manuscript dealing with Northern British Columbia, sundry correspondence with settlers on various subjects, and winding up the business connected with the office, which is to be closed for an indefinite period, were attended to. Everything has been left in the charge of Mr. McMullin, Government Agent for the Skeena District.

PROSPECTS FOR 1917.

While in some respects the winter of 1916-17 was somewhat severe in parts, yet this was on account of storms and excessive snow rather than unusual cold. On the other hand, the presence of so much snow bodes well for wintering crops and fruit-trees, and there should be very little damage experienced from winter injury as compared with the severe winter of 1915-16.

On account of the large number of men enlisting from all parts it would be unreasonable to predict that there will be greater production during the coming season than during that of 1916, yet from all indications it is certain that all those who are remaining on the land are determined to make far greater efforts than ever before, especially along the lines of producing more vegetables for home consumption.

RESIGNATION.

With the submittal of this report your assistant resigns from the Government service with regret, as the work has been of great interest and the acquaintances made in various sections of a very large district have been very congenial.

Respectfully submitted.

A. R. NEALE,
Acting Assistant Horticulturist.

ANNUAL REPORT OF PRAIRIE MARKETS COMMISSIONER.

J. A. GRANT.

M. S. Middleton, Esq.,
Provincial Horticulturist and Inspector of Fruit Pests,
Department of Agriculture, Victoria, B.C.

SIR,—I have the honour to submit herewith my annual report as Prairie Markets Commissioner for the year 1917.

APPOINTMENT AND ACTIVITIES.

Under your instructions and following up the work instituted by my predecessors in developing the Prairie market for British Columbia products, your Commissioner's first duty last April was to examine the possibilities of British Columbia crops as a source of supply, and ascertain, as nearly as possible, the state of competitive crops in the United States, which have usually been shipped to the Prairie Provinces in competition against British Columbia.

As the shipping season was well under way before the Commissioner's Calgary office was opened, no time was lost in interviewing the large brokers and jobbers to ascertain their opinion of the possibilities of the Prairie market and to inform them of the prospective supply they may expect to handle during 1917. This involved several visits to the larger trade centres. Much information was given and received on these visits, but the consensus of opinion prevailed that if the producer wanted to fix the price of his products, the stopping of consignments, especially to the retail trade, must precede it.

IMPRESSIONS.

Among other impressions gained was that British Columbia fruit was well known on the Prairies, largely due to previous advertising; that British Columbia McIntosh Red apples were prime favourites; and that "minimum weight" stamped on fruit-containers, as adopted by American shippers, and lived up to, placed British Columbia containers at a disadvantage on sale.

Your Commissioner soon found that the greatest service to British Columbia shippers could be rendered by linking up the extreme ends of the fruit business, by placing the growers and shippers in touch with the buyers, and the buyers in touch with those who had something to sell. This was the key for the year's work.

It is very gratifying to report that in every effort made to benefit trade the dealers gave their harmonious support, and market quotations were honestly and cheerfully given.

The general shortage in all lines of fruit, from all quarters of the United States and Canada, was a feature of the 1917 season.

The embargo on apples to Great Britain and Australia had not the disturbing effect that was feared at the opening of the season. The crop shortage in Ontario, Quebec, and the Eastern States gave Nova Scotia, which had a bumper crop, sufficient outlet for her surplus without exploiting the Prairie market to the extent that was at first threatened.

A shortage commenced with the Southern strawberries and was felt during the entire season, resulting in unusually firm prices for all fruits offering and big demands for former sluggish sellers, the better and more popular fruits not being sufficient to go around. Care should be exercised not to plant heavily to varieties usually in poor demand, as conditions in 1917 were abnormal and may not occur again for several years. Berry fruit has not been sent from British Columbia in sufficient quantity to fill the demand for some years, and there was little fruit preserved in 1917 for this reason.

GROWING WHAT THE MARKET WANTS.

Planting suitable fruits is an imperative need, and immediate steps should be taken to regulate it, so that the popular fruits may be grown in sufficient quantities for the growing needs of the Prairie market. It is plainly apparent that far too many varieties of apples are grown and many of them should be rooted out or top-worked.

Another point needing attention is the indiscriminate flooding of the market in the late fall with winter apples, many of which are consumed out of season. Apparently, quick returns was the aim of the merchant; therefore the matter should be regulated at the shipping end.

PACKING AND PACKAGES.

In some instances, especially on the part of individual shippers, the packing left much to be desired. Southern shipments were in many cases preferred, not because of the quality of the fruit, but because the packages were better filled, and it is painful to admit that in many instances both quantity and quality were judged to our disadvantage. It is evident that the United States organizations are more strict regarding rules than those in British Columbia, as every package, besides being properly marked, also had a "minimum weight" stamped on it. It was apparent that care in filling the packages well and stamping the weight on the package was well paid for in the extra price obtained for the goods.

INCREASING SUPPLY AND F.O.B. BUYING.

The increased supply of produce in British Columbia resulted in 1917 in the wholesale dealers of the Prairie Provinces sending their buyers into our valleys to purchase f.o.b. shipping-point. Our supply is now such that British Columbia is the leading factor in their trade, and by coming on the ground they can examine the goods offered for sale and secure a sure supply. This method has a strong bearing on steadying the price, as goods bought at market prices must be sold at a profit, and jobbers have no incentive to cut prices to secure trade, as happens under the consignment system. Wholesalers find this a clean and healthy way of doing business, as it gives them all a fair field and no favour. This method of trading is general in fruit sections, excepting in British Columbia, where the old and unsatisfactory method of consigning produce is practised to a great extent and is as unsatisfactory as it is antiquated.

REFUSAL OF PRODUCTS SOLD F.O.B. SHIPPING-POINT.

The chief drawback to this system is the never-failing claims made by jobbers at the other end, especially on a falling market. Sales subject to Government inspection at the selling end, as explained elsewhere in this report, would offset this evil, and is strongly to be recommended. When this is not possible, the cars on which claims are made, if refused, should be turned over to a competitive house on consignment, or be subject to advice from your Commissioner as to the best thing to do under the circumstances. If shippers would follow this plan the claim bogy would vanish.

UNITED GRAIN-GROWERS WANT 400 CARS OF APPLES.

The 1917 supply for this organization was largely lost to British Columbia growers. The fruit-buyers for this great organization missed securing their supply when buying was good, and completed their deal when British Columbia dealers had almost sold out and were unable to fully supply them. This organization can handle 400 cars in 1918, and perhaps the lesson of 1917 will work to our advantage then. They are beginning to see that we have the goods and our prices are right.

WEEKLY REPORTS.

The regular weekly bulletin reports were issued from Calgary as usual, from June to November. The circulation of this report has greatly increased, and the advice to shippers contained therein has been favourably commented upon in many districts. The market prices have been carefully recorded by a staff of competent correspondents and the whole field of prices reported. The f.o.b. shipping-point price, the wholesale and retail prices have appeared weekly. The bulletin was mailed every Saturday by the afternoon train, and reports up to 9.30 of that day were included in it. If the urgent requests from the wholesale trade are complied with during the coming season there will be a greater circulation, in which event it is intended to furnish this bulletin to every wholesale dealer in fruits and vegetables on the Prairies. The weekly circulation in 1917 was over 850, and with this change would reach 1,200 in 1918.

NEW REFRIGERATOR-CARS.

Owing to the general scarcity of labour the fifty new refrigerator-cars expected were not ready in time for last season's berry-crop. These cars are now reported available. They are larger than the old ones and modern in every way, and there will be no difficulty in getting the minimum weight into them. Every district that can assemble express shipments in car-lots should do so, as the limit of local express transhipments at Calgary has about been reached. These new cars should land tender and perishable produce on the market with dispatch and in prime condition.

After a season's experience at the Prairie end your Commissioner has no hesitation in recommending shipments by car-lots wherever possible.

STRAWBERRIES.

The demand for strawberries was far in excess of the supply. The general shortage in the United States virtually shut out that competition, and any that were imported from Hood River and Kennewick were sold at a high price.

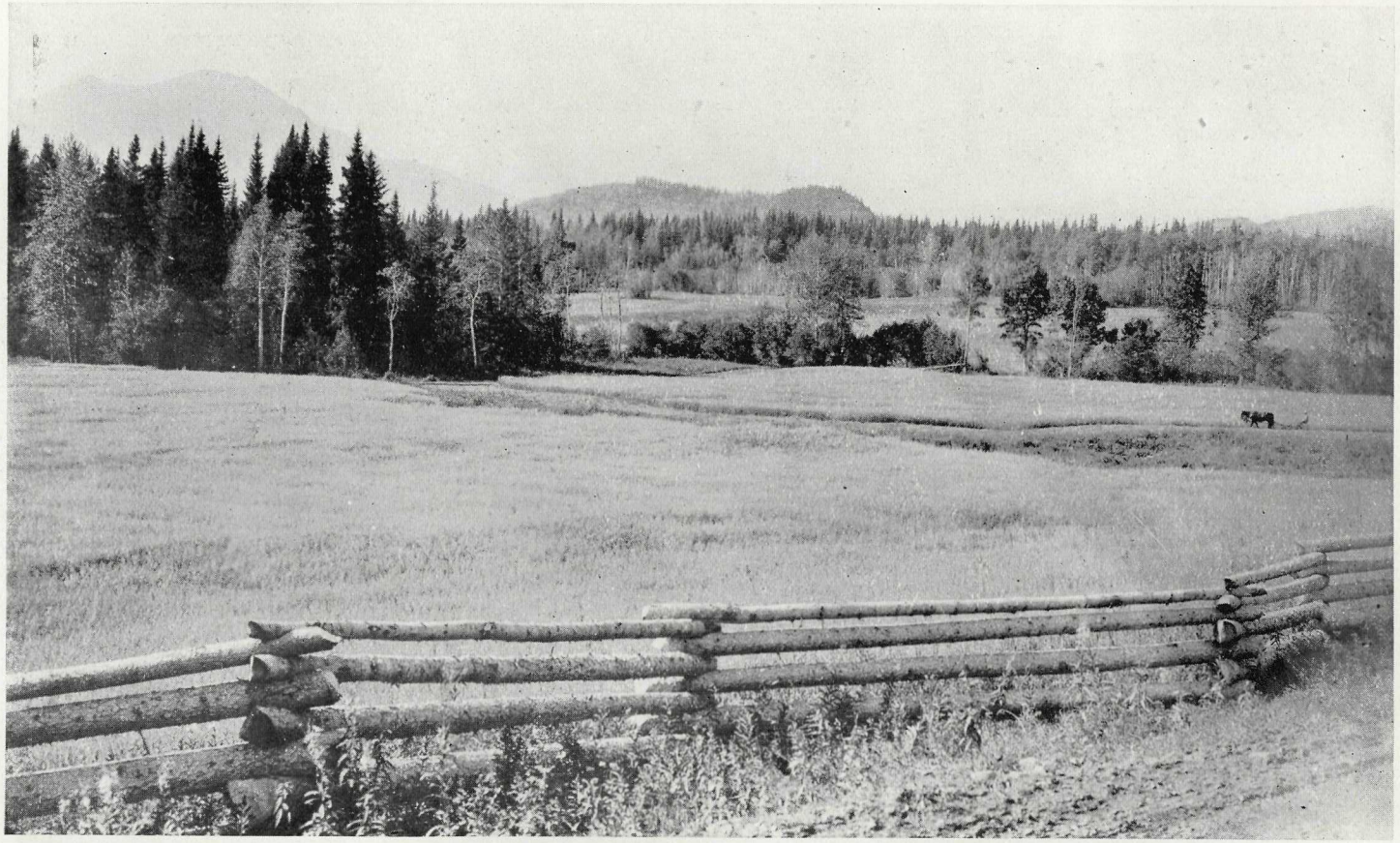
Dry weather was responsible for a short crop in British Columbia strawberries in 1917. Early estimates pointed to a big supply, with a great increase in shipments to the Prairies over previous years.

The Gordon Head and Keating Associations expected to send twenty-eight cars and succeeded in shipping twenty-two, as against eleven in 1916. The Creston growers expected to ship twenty cars and only shipped equal to twelve cars, six of which were in car-lots. These are the only points in British Columbia that shipped iced car-lots of strawberries, and the condition on their arrival showed clearly the superiority of this method of shipment over L.C.L. lots.

There was no loss from shrinkage in any of the strawberry-cars, and one sent to Winnipeg arrived on Saturday, and Sunday and Monday (Dominion Day) passed before it was opened, when it was found to be No. 1 condition. Had this happened under L.C.L. conditions the car would have been a total loss. Berries shipped in iced car-lots are worth 25 cents a crate more

Clean cultivation in the Kootenays.

Fruit-packing school, Vernon, B.C., 1917.



In the valley lands of Central British Columbia.

than those shipped L.C.L., and wherever this method of shipment is possible it is strongly recommended. The car-lots were handled exclusively by the Mutual Brokers, and their work was very satisfactory in Alberta and Saskatchewan. Five cars of strawberries were sent from Victoria to Winnipeg to the Mutual Brokers there. These berries were in fine condition when they arrived in Winnipeg and the market was hungry for berries, but, due to mismanagement, the prices realized were very unsatisfactory.

Signing Contracts.—The custom of signing a contract to send all the strawberries to a brokerage concern from a given district or from the Province has its weak points. Other brokers on the Prairies have to seek elsewhere for their customers' needs, and if at all possible to meet our price they buy from United States points. It would be fair if every responsible broker had the option of buying f.o.b. shipping-point at prices set by the association, as is customary elsewhere, and if they could not get buyers for the total crop, then ship the balance on consignment or to an agent, with a proviso that they should not undersell the f.o.b. buyer. As the strawberry-supply is far below the demand, there is little chance that any will be left unsold f.o.b. shipping-point, and if the association can get along without this extra service (for which they pay very handsomely) it would be a considerable saving.

The local express shipments were very heavy and were made without any system, and the unorganized growers of the Fraser Valley were responsible for an early break in market prices that was unwarranted. The demand was far in excess of the supply, but as the Calgary retail merchants had consignments made to them without restriction they became the price-setting factor. Your Commissioner had to call dealers' attention to the unwarranted state of the prices, and this was met in a very fair spirit, but the consignments spread and no general control could be exercised. The result was that the Alberta market was shattered on a bare market.

The Japanese growers of Haney sent in a good pack of well-filled hallocks and shapely berries, but consigned them to every wholesale and nearly every retail house in Calgary, with the result that they had to meet competition against themselves, and these shippers were not alone in their folly.

Some new shippers sent in a slack pack of sandy and ill-shaped berries, which created much unfavourable comment and had a bad effect on the market. Some system of inspection should prevent such stuff from ever appearing on a distant and critical market. The home by-products plant could absorb them at a profit, whereas they were a loss to the growers which sent to Calgary, and an injury to the district as well.

There has been a decided unwillingness on the part of Prairie dealers to handle big strawberries, as they are usually lacking in uniformity; are poorly shaped and insipid to the taste. Growers should send such berries to the jam-factory or to whoever may desire them; they should not send them to the Prairies. A general organization of such growers would work wonders in their bank account, as by this means a well-regulated trade would replace a very uncertain and dangerous condition of affairs.

Salmon Arm and Armstrong sent in some very creditable strawberries, and they, with those from Creston, netted the best average price for the season for this fruit; the express rate from these points, being less, helped towards this result.

RASPBERRIES.

Early in the season it was feared that, as a result of a freeze the previous October, the raspberry-crop of the Pacific North-west would not exceed 40 per cent. of an average. This estimate proved too true, and the competition with Puyallup was almost entirely cut off. The Fraser Valley, which has undisputed superior conditions for producing this popular fruit, had matters all their own way in 1917, but lack of organization prevented the growers from getting the full advantage that would otherwise have fallen to them. Their crop was also less than normal, and the supply was only sufficient in some cities to annoy the dealers.

Owing to the general shortage, buyers appeared in the valley and offered good prices f.o.b. for all the fruit obtainable. Several growers undertook to do a mail-order business and advertised ahead of the season at prices very far below the market. These advertisements had a depressing influence on the market, and these men had orders, far beyond their ability to fill, all paid for in advance.

In one instance a grower shipped individual crates of raspberries at $1.80 on days that he was offered $2.25 by a prominent broker for all he had at the Mission City depot. The demand

was so brisk that the association could not rally their members to concentrate and ship cars, with the outcome that only three cars were shipped in that way. Two of these contained wet berries and, as was expected, arrived in mouldy condition, and it is doubtful if the iced cars averaged as well as L.C.L. shipments; under the circumstances, the iced cars did not have a fair test and growers should not abandon the car-lot shipments on the 1917 results. All competitive berries came in iced car-lots, and some of them came in precisely the same condition at the same date. Very few cars came from Puyallup, and those which did netted a high price. These growers use the shallow pint hallock with the net weight stamped on it, and as the Prairie trade like their containers and filled hallocks they showed their preference by paying more for them than for the British Columbia ⅔-quart, although our fruits had the edge on them when shipped, but the journey under L.C.L. conditions gives raspberries a very muddled appearance. If conditions were normal the car-lot stuff would command a better price and would sell in preference. Last season's results of the respective ways of shipping did not constitute a fair test. Prices varied in different cities and the variation was governed by the amount of consignments arriving at different points, and was not subject to competitive prices or the law of supply and demand. If the Fraser Valley growers would organize and plant many times their present acreage of raspberries they would rival the famous Puyallup Valley, and be in a very enviable position financially. The Fraser Valley should be and will be the reputed raspberry-growing district of Canada when their opportunities are used as they should be.

LOGANBERRIES.

Loganberries were off in crop in 1917 due to an October freeze in 1916. The fruit has been popular on the Prairies, but a poor shipper; it will never be a great factor in the fruit-supply of the Prairies in its raw state, but its future as a preserving fruit for factory and home use would warrant its acreage being slightly increased.

BLACKBERRIES.

The Fraser Valley thornless variety was a good crop in 1917. The demand was good and a fair price realized; apart from the soft condition of this fruit on arrival towards the end of the season, there were no complaints.

BLACK AND RED CURRANTS AND GOOSEBERRIES.

Both the supply and demand for these fruits are limited, and growers in districts where these overlap their staple crop should leave their production to those that have no special line. There is little risk in planting black and red currants if labour is available to pick them when ready.

APPLES.

British Columbia apples were by far the most satisfactory to the trade, and this is gratifying as they constituted the lion's share of our offerings. Both package and pack were favourably commended.

With a view to extending our No. 1 apple market, your Commissioner would recommend the consideration of shipping the choice stock to more distant markets and shipping a smaller proportion to the Prairie market. If Nos. 2 and 3 were placed in crates and shipped under a special brand, the ordinary domestic trade would be suited about as well as they are now, at a less cost. No. 1 stock would command a higher price, being further distributed and therefore scarcer. This is briefly the policy of our competitors to the south; almost all their high-priced apples sold east of the Mississippi River, and if it is good policy for the growers in Washington State to cater to the high-class trade in the Eastern States, it would reasonably follow that the Canadian cities would absorb our finer grades at a higher price. Montreal and other Eastern Canadian cities are to-day buying Washington apples for the fancy trade, and at a price that should make us envious. Why not push our British Columbia No. 1's there? We have the goods and should go after that business.

Some consideration should be given to the spread in sizes on dessert apples constituting No. 1's. Complaints were made on several shipments that the spread was too great in the count, especially in Jonathan, Wealthy, and Winesap varieties.

PEARS.

Most of the pears consumed on the Prairies in 1917 came from the United States. In the early season market this is inevitable, but when British Columbia pears come in there is still a predominating supply of Washington stuff. The keeping season of the Bartlett variety is so short that a big planting to that sort would be unwise, but where other pears thrive well there are good prospects for an increased acreage.

This popular fruit is not well enough known on the Western Prairie market. The Winnipeg market shows the difference in price for the respective varieties in the same season. This condition will change and other markets will be just as critical when we send varieties into the market of quality and in sufficient quantities to make the difference in merit noticeable to consumers.

It would be wise to limit the number of varieties coming in at one time. A good spread in season would be beneficial; winter varieties are shortest. Prices on the Prairies were high in 1917 for good stock.

APRICOTS AND CRAB-APPLES.

Apricots were a short crop in British Columbia; they were small, but sold at a very high price. This is a fruit that seems to have little competition from the South on the Prairie markets. British Columbia apricots and crab-apples seemed to monopolize the Prairie market. Where apricots can be successfully grown there should be increased plantings, as the supply is very scarce. The Hyslop crab-apple has been in great demand and should also be further increased in acreage.

CHERRIES.

The early British Columbia varieties, such as Governor Wood and Early Richmond, are not profitable; they come in competition with Bings and Lamberts from Kennewick, Wash., and make a very poor showing by comparison. The Black Tartarian is presentable, as is the Royal Anne, but the high-priced varieties are the Bing and Lambert. Growers should think well before planting other varieties of sweet cherries. Prices were good when our cherries were presentable, and our Bings and Lamberts were very fine.

COOKING-CHERRIES.

The Olivet and Morello are the leading varieties in cooking-cherries. Prices were good in 1917, but previously did not pay their way. There is only a limited market for sour cherries and the present plantations seem sufficient to supply all demand in the near future.

PLUMS AND PRUNES.

During the season plums and prunes were in brisk demand. Some fine plums were shipped from the Fraser Valley, but developed plum-rot en route and had to be jobbed off quickly at a low price. In districts where this disease is not under control quarantine regulations should be enforced, as many cases became infected en route. If plums were free from this disease they would be welcomed on the Prairies, but as it is now dealers refuse to handle stuff from infected places.

The 4-basket crate is the favourite for plums and sour cherries, and the ability of our Southern growers in getting over 5 lb. in each basket resulted in their getting a slightly higher price than our average. As the season advanced this was largely overcome and our growers met them on the level with an equal pack.

British Columbia prunes had an off-year and sizes were under the average, but the scarcity saved the situation and good prices ruled. It is your Commissioner's opinion that prunes only should be shipped in the 14-lb. prune lug-box, unless for special purposes.

VEGETABLES.

There is a growing demand for onions, celery, beans, and potatoes, and an increasing market is assured for these vegetables.

TOMATOES, CANTALOUPES, AND CUCUMBERS.

The Okanagan Valley, Walhachin, and other up-country growers placed a greatly increased supply of these on the near Prairies; they have found it profitable, and this field can also be

enlarged. British Columbia tomatoes and cucumbers are superior to any others offered on the Prairie market.

RHUBARB.

The trade admits the superiority of the Fraser Valley shipments over Walla Walla importations. Prices were a little better in 1917 than formerly, but these suffered because the British Columbia associations did not insist in setting the price f.o.b. shipping-point.

It was gratifying to see the superiority of the commodity from British Columbia over all-comers, both in pack and quality, but, notwithstanding this fact, it realized the smallest price. This trouble can be regulated in another year if the local organizations set the price.

EXPANSION OF BRITISH COLUMBIA MARKETS.

British Columbia apples, potatoes, and onions are gradually finding favour in markets beyond the Prairies. Toronto, Montreal, and Ottawa are now buying all these three food staples from us in increasing quantities. Every car we succeed in placing in Canadian cities displaces the imported stuffs. It is only the high-class produce that cannot be produced locally which will pay to send so far. We have also sent an increased quantity of crab-apples and McIntosh Reds to Minnesota; this territory is tributary to the Prairie Markets and should receive some extra efforts on our part to further increase this desirable trade.

I regret to state that some British Columbia shippers seem to think that their operation on these markets is their individual concern, and when asked for a statement of their shipments to new markets refuse to give it. This secretive tendency on the part of shippers prevents proper attention being given to develop the possibilities of this trade. If a Markets Commissioner is to give good service, he must not only have the full confidence of those he seeks to serve, but all the information available on shipments to the markets. The growers of produce cannot hope for the best services in development of new markets if their agents (public or private) do not co-operate with them to the extent of giving the information that is necessary for the best results in the least time.

PACKAGES.

The question of uniformity of package is a hardy annual which yearly gives your Commissioners much concern. Year by year uniformity is gaining ground and only a few packages now require adjustment. Our competition comes from the United States, where packages have been standardized as the outcome of hard plodding; the growers there have had much more experience than British Columbia growers, and a close observation will show that we are following slowly in their wake in this respect. Our apple, pear, and peach crates are satisfactory, and lack but the net and gross weight stamped on them to make them equal to the best.

The 24 1-pint deep hallock strawberry-crate is now entirely used. The greatest difference is now noticed between the ⅔-quart shallow hallock crate and the shallow pint hallock crate; these are used for loganberries and raspberries; the ⅔-quart only being in use in the Fraser Valley, and the shallow pint all over the United States and in other parts of British Columbia.

The shallow pint hallock is preferred by most of the Prairie dealers, as it is a direct stand-off to the American hallock; but either or both would be satisfactory if a reasonable minimum weight were put up in them. Raspberries in bulk will shrink greatly in transit, but if the weight is there when sold purchasers know that they are being honestly dealt with. Without this minimum weight there is room for much dissatisfaction.

Every day during the shipping season complaints were registered about short weight in raspberry-packages. Without a weight standard the measure means nothing, and unscrupulous pickers can give much trouble to the grower, the jobber, and the consumer. The American competitor is compelled by association rules to give honest measure. Your Commissioner would like to see the shallow pint made general for berry fruits, but first in importance comes the minimum weight. Without a minimum weight we cannot defend our position when claims are made for short weight, even though damage in transit may have caused the trouble, and as only a small percentage of growers ship a slack pack, why should the majority of careful packers allow the market to be regulated by the minority's dishonest packers? We certainly should have a minimum weight for raspberry-hallocks.

It should be definitely settled whether apricots should be shipped in 4-basket crates, peach-boxes, or prune-boxes. At present all these aforementioned boxes are being used, which is confusing to the trade.

ADVERTISING.

Advertising was a special feature of your Commissioner's predecessors. The result of their well-placed general advertising is apparent, and it is chiefly due to this that British Columbia fruits are so well known on the Prairies. While it seems that the day of general advertising is over for us on this market, still it must be understood that we cannot afford to neglect special advertising. During the peak of each fruit season, from the strawberry to the peach, there is a period of seemingly oversupply. It is necessary to draw the attention of the busy housewife to the cheapest time to buy a particular fruit and the best time to buy for preserving. The public press is the best medium for this purpose to ensure immediate results. These passing opportunities should be presented to her in the same way as bargain-times in the dry-goods business are presented. The wholesale and retail merchants do this advertising now in a small way, but it could be augmented with the co-operation of the growers. The result of well-placed special advertising in most cases would turn a loss account into one of profit. A fund for this purpose is a good insurance policy, which to be effective should be operated under one head.

CO-OPERATION IN MARKETING.

The time has come when shippers should have an understanding as to the value of their produce; at present there is too great a spread between their quotations. Our Prairie market is undergoing a rapid expansion, and a better understanding amongst shippers as to quotations would prevent them being so much at the mercy of the middleman.

The greatest market demoralizer is the grower who finds his own market; he is unconsciously the means of much suffering and hard feeling, as he usually succeds in lowering the market for himself and others. It was the exploitation of the individual shipper by the middleman that led to the organizations of to-day. His control of price-setting and exaggerated claims on conditions of goods received forced the growers to protect themselves. It is only by organized effort that growers can protect their interest on the distant market.

Organizations must co-operate to a greater extent in the co-ordinating of prices quoted on the produce they offer for sale. The main result obtained by a proper understanding between shipping organizations would be to limit the spread, on a given date, of similar produce. An understanding of this kind, if lived up to, would prove a benefit both to buyers and sellers, by preventing hold-ups and sacrifices, and would secure a live and let-live price. It would also acquaint the growers as to the exact state of the markets and help them to regulate their crops accordingly.

If we cannot establish a mutual faith in our fellow-growers the working power of co-operation is lost. The history of such a failure shows decline in prices below cost of production, followed by a decline in production and loss of the market to those who maintain their organizations in a healthy state.

In conclusion, it should be impressed on all British Columbia growers that the Prairie market wants good sound produce honestly packed. It should be borne in mind that British Columbia is meeting competition from districts in good favour.

The shipping districts must protect themselves against the loss of a certain portion of their crop which it would be unwise to ship, by encouraging by-product factories to establish as near them as possible. It would be beneficial if interprovincial and export shipments of all perishable produce were subject to Government inspection at shipping-point; this would prevent the shipment of culls and other low-class produce that is so injurious to the reputation of the Province.

CONCLUSION.

There has been a strong cordiality between the growers, shippers, and brokers and your Commissioner, as well as a continuous demand for information by the jobbers and retail merchants from this office.

This report would be incomplete if mention were not made of the unanimity of purpose that prevails between this office and the Dominion Fruit Inspectors' offices, both in British Columbia and the Prairies. In every emergency that has arisen the full co-operation of their staff has been available, which has greatly added to the success and results of our efforts.

The general outlook for the future points to a rapidly increasing market and a continuation of good prices, and British Columbia's portion of the business will be in relation to our supply and the amount of energy we exert in stimulating trade.

Respectfully submitted.

J. A. GRANT,
Prairie Markets Commissioner.

ANNUAL REPORT OF MARKETS COMMISSIONER AND INSPECTOR IN CHARGE OF EXPORTS.

R. C. ABBOTT.

M. S. Middleton, Esq.,
Provincial Horticulturist and Inspector of Fruit Pests,
Department of Agriculture, Victoria, B.C.

SIR,—I have the honour to submit herewith my annual report on the inspection-work under my charge; also on marketing conditions within the Province of British Columbia, and more especially in the Coast cities, during the year 1917.

WEEKLY REPORTS.

The weekly reports were issued regularly from June 2nd to December 22nd, inclusive. These reports dealt with the weekly market conditions and export trade. The total number sent out was 13,050. These reports were also printed in the press throughout the Province and were very much appreciated by the general public. In addition to the above, the city press was given material from time to time which would be of interest to the growers.

A large number of circulars on the canning of fruits and vegetables, potato booklets, British Columbia fruit booklets, and Department bulletins and circulars were distributed from this office.

Throughout the year the work of giving out information *re* buying and canning of small fruits was continued, a part of the work which is very much appreciated by the consumers of the City.

FRUIT INSPECTION.

This work was carried on throughout the year and used in connection with an educational campaign in the matter of putting up a better class of produce. The attention of your Inspectors was also given to export apples going through the Port of Vancouver and which amounted to 77,760 boxes.

POTATO INSPECTION.

This work was carried on, not only in regard to potatoes for export, but also field inspection throughout the growing season.

EGG INSPECTION.

Large quantities of Chinese eggs were shipped through this port in bond in the early part of the year. Your Inspectors made a determined stand to carry out the provisions of the Act, with the result that brokers decided to ship such eggs to Alberta rather than go to the expense of marking each individual egg. During the year there were twenty-two prosecutions and a conviction in every case obtained.

LOCAL MARKETS.

Generally speaking, the local markets for fruit, vegetables, and all other classes of farm produce have been excellent.

Strawberries.—These were somewhat short in supply and maintained a high price throughout the season. The greater amount came in from the Japanese colony at Haney. The berries were well packed and graded and showed a marked improvement over former seasons. A considerable quantity from Burnaby, which formerly came into this market, were shipped to the Prairies.

Raspberries.—The Coast cities received their supply principally from Burnaby, South Vancouver, and Lulu Island. Approximately 90 per cent. of these were shipped into this market

from the above districts in the local two-fifth crate. Some 500 crates were shipped from Burnaby to the Prairies during the season. While this office received but few complaints on light-weight crates of strawberries, it was continually receiving complaints on light-weight raspberries. The tolerance of the use of the local two-fifth crate gives every opportunity for short weight.

Loganberries.—These met with strong demand and prices were good. This berry is steadily increasing in demand in the Coast cities and the future outlook is indeed bright.

Currants.—The supply of currants was still short of the demand. Both black and red varieties, if put up in good shape, have been coming more in favour each season.

Gooseberries.—The past season has been the best yet for gooseberry-growers. One of the greatest difficulties in marketing gooseberries successfully has been the determined practice of many growers of picking and marketing their entire crop in one shipment. In the weekly market reports for the last three years your Commissioner has reported against this method, and is pleased to say the results obtained this past season from marketing steadily a small supply each day over a long period have doubly repaid the growers, not only by the elimination of waste, but by increased prices and weight obtained as well.

Plums and Prunes.—The supply of these came in gradually last season and, with the exception of two or three days, moved out rapidly, thus bringing the loss from plum-rot down to a minimum. The average prices were higher than usual and there was very little competition from foreign stocks.

Cherries.—Sweet table-cherries, such as Bings, Royal Annes, and Black Republicans, sold well all through the season. Early Richmonds and half-ripe Montmorencys found little call and growers usually suffer a loss on these varieties. Owing to the bulk of the Olivet and Montmorency cherries from Vancouver Island going to the Prairies in 1917, Vancouver City received very few crates of these varieties.

Apricots, Peaches, and Pears.—British Columbia supplied a very small portion of these fruits during 1917. While the total consumption of apricots in Vancouver was 8,675 crates, British Columbia supplied only 2,325, and 6,500 out of a total consumption of 62,653 boxes of peaches. The greater bulk of pears also came from outside of the Province.

Apples.—British Columbia apples now predominate on the Coast. It would appear that the old prejudice against British Columbia apples has been wiped out, and, with the exception of one firm, the wholesalers have given preference to home products.

The heavy imports during 1916 and 1917 have been during the months of February, March, and April, when there was not a sufficient supply in British Columbia. With the stock on hand on December 31st, 1917, and the available supply yet in the Interior, it would appear as though these three months of 1918 will not see any large amount being imported from the United States.

Potatoes.—Much attention has been given to the development of the potato market, both local and export. The results gained, although slow, have, it is believed, been very beneficial to the growers. In three seasons the average price at digging-time has risen from $7 to $24 per ton.

During the shipping season for the 1917 crop a most perplexing economic question confronted your Inspectors, as to how it would be possible to eliminate the waste on the market, due to shrinkage from diseases, principally late blight in shipments from west of Yale, and jelly end-rot in shipments from the Interior. On examination, it was found that shipments resorted in Vancouver showed as high as 70 per cent. infection, and many with an actual loss of from 3 to 15 per cent. This was a great economic loss, especially to growers. They were not only losing stock they might have fed to hogs or other stock on the farm, but they were compelled to pay freight, resorting, and incinerator charges. Also the already overworked transportation facilities were being utilized in carrying stock which turned out to be a total loss as food. A hurried survey showed the major portion of the wastage coming from the Districts of Chilliwack and Agassiz. Steps were taken at once to try and stop, if possible, this unnecessary wastage by inaugurating an inspection service at the shipping end.

While the inspection-work no doubt saved the growers, shippers, and consumers untold financial loss, it also demonstrated clearly that, no matter how careful the inspection might be, it is impossible to always detect conditions causing serious losses on the market.

Just previous to and during the planting season of 1917, demonstrations and lectures on the treatment and selection of potato-seed were given each Friday at the New Westminster Market. These lectures created much interest and were well attended by farmers. This same

work was carried on throughout the Lower Mainland by your Inspectors, who visited 1,032 farms during the season.

While powdery scab was very prevalent in 1916, only a slight trace was found in 1917.

Two Chilliwack farmers who have for the past two seasons been following the recommendation of this office in the selection of seed and planting of seed-plots claim to have increased their yield of marketable potatoes 30 to 50 per cent.

During the year the inspections were as follows:—

Total potato inspections	5,832
Total cars passed for export, January 1st to December 31st, 1917	766
Total cars condemned	541
Total cars inspected in city for local use	333

Tomatoes.—The British Columbia crop of both hothouse and field tomatoes was marketed with more satisfactory results to the growers in 1917 than in any previous year. It might be said that the shipments totalled more than 60 per cent. of those in 1914. The wastage was so small that it cannot be recorded as against the loss of some eight cars in 1914.

The home canning of tomatoes in the City of Vancouver is increasing each season. Since the arrival of the tomatoes from the Keremeos District, which are far superior in flavour to those produced in other districts, the table consumption has increased wonderfully.

Beans.—The production of beans was much greater than in former years. These have found a ready sale at good prices when car-loads could be made up.

Other Vegetables.—With the exception of onions and carrots, other table-vegetables have been scarce, and a great deal of difficulty was encountered in finding a supply for export trade.

In the month of March a very large shipment of Australian onions was received in Vancouver, but owing to heating in transit became almost an entire loss. During the month of November there was a heavy storage of British Columbia onions in Vancouver, and at the end of the year these showed approximately 70 per cent. growth. Speculation in onions during 1917 has caused a great wastage of foodstuffs.

Farmers were encouraged by the evaporators to grow red carrots and onions. These evaporators then bought their supply of carrots and onions from California early in the season before British Columbia stocks were ready for use; consequently, the growers on the Lower Mainland have their stocks still on hand.

The export demand for mixed cars of vegetables is gradually increasing, and our trade has suffered a great loss this season on account of the shortage in cabbage, parsnips, and beets.

There was a decided increase in the shipments of British Columbia peppers and egg-plant from the Okanagan Valley.

Rhubarb.—This office has encouraged to some extent the growing of forced rhubarb, and growers who are giving attention to this part of the industry have indeed done well during 1917. This produce was found on the Vancouver market almost continually from January 1st to August 1st.

Cucumbers.—In the early part of last May all assistance possible was given to a new pickle company who were desirous of starting in Vancouver. They were able to contract and arrange with some growers to grow pickling-cucumbers, and although it was late in the season before arrangements could be made, the pickling company are satisfied with the results, and it is understood the growers did as well as could be expected. Encouragement has been given to this industry for the past four years, and it is one which we believe has a very bright future before it. This company will extend their efforts to the Okanagan Valley in 1918, and will also take cauliflower, beans, etc.

SUMMARY.

Summing up the situation for the year, it was found that there was very little loss in wastage of foodstuffs in Vancouver as compared with other years.

Every effort has been made on the part of this office to assist wholesalers and dealers of foodstuffs where the movement was slow. The marked improvement in the packing and grading of fruit and vegetables has a great deal to do in the elimination of this waste. Where carelessness was shown on the part of the producer in the shipments of fruit and vegetables into the city, this office took the matter up direct, and if necessary visited the farm and gave instructions as to the proper methods of packing and grading. Assistance was also given in the marketing

of dressed meats and poultry, and, when complaints were made, assisted in adjusting same to the satisfaction of both shipper and dealer.

Producing shippers have been protected in their collections. In every case where farmers notified this office there has been no loss whatever. This is a very important branch of the work of this office, and growers in general appreciate it very much.

Respectfully submitted.

R. C. ABBOTT,
Coast Markets Commissioner and Inspector in Charge of Exports.

REPORT OF SOUTHERN OKANAGAN FRUIT AND VEGETABLE EXPERIMENTAL STATION, SUMMERLAND.

J. L. HILBORN.

M. S. Middleton, Esq.,
Provincial Horticulturist and Inspector of Fruit Pests,
Department of Agriculture, Victoria, B.C.

SIR,—I beg to submit my annual report on the work of the above station during the year 1917.

PEPPERS.

There were grown 3,240 plants of sweet peppers, which yielded 142 peach and 326 apple boxes of fruits at a total cost of $220.70, including allowance for rent of land, also all taxes, fertilizers, boxes, and all expenses incurred in growing and marketing the crop, which brought a gross return of $820, leaving a net balance of $599.35 for the $^5/_{11}$ acre grown.

As usual, the seeds were started in the greenhouse early in March, and twice transplanted before going to the field. They were planted in rows which were 3 feet 4 inches apart, the plants being set about 20 inches apart in the row, and given very thorough cultivation throughout the season, and irrigated when they seemed to require it.

We are ever striving to produce or obtain better varieties of peppers as well as other vegetables, and this season grew two varieties obtained from the South which gave excellent satisfaction—Pimento, a medium-sized pepper of very smooth and perfect form, and very heavy, the flesh being fully a quarter of an inch thick. The other new variety, called Giant Neapolitan, promises to also be a valuable variety. It is a large early sort, worthy of further trial, and it is hoped to improve it by selection.

The land for this crop was prepared as described for the growing of cucumbers.

TOMATOES.

As in the case of cantaloupes, the chief commercial crop of tomatoes was grown on a neighbouring farm, but a portion was also grown at home. In both cases the crop was quite satisfactory as to yield and prices obtained, showing a net balance per acre of about $670 over total cost of production.

As heretofore, the seeds were started in the greenhouse, but this season the first sowing was done a little later than heretofore, and it is thought that March 1st is sufficiently early for starting. The plants were transplanted three times, each time into other flats, and given more space, as is done in the growing of all vegetables grown in this way. The flats used for this purpose are 12 x 22 inches, inside measurement, and 4 inches deep.

For the last transplanting with tomatoes, cucumbers, and melons, only eight plants were put in a flat. Hence in moving to the field they receive no check. This enables the bringing of the crop forward much earlier than would be possible if the root system was disturbed in transplanting.

Regarding varieties, while we are still obtaining good results from the Bonnie Best, the bulk of the crop is still produced from Earliana, and, although testing many other varieties, we have been unable to discover anything as good if a good type of seed is used. Best results have been obtained from seed procured from H. P. Langdon & Son, Constable, N.Y. By selecting fruits from the best plants throughout the field, and repeating this year after year, has enabled the production of a type as good but not better than that purchased from the sources referred to.

While some growers claim to have had good results from planting tomatoes on rich soil, the same cannot be said of the results at this station, as the plants grow so large that the crop is produced too late to secure satisfactory prices. This station obtained the best results from soil of only moderate fertility.

EGG-PLANTS.

From $^{5}/_{12}$ acre in 1917 662 apple-boxes of this valuable but little-known vegetable were produced at a total cost of $293.30, which sold for $829.80, leaving a net balance of $536.50.

The seeds for this crop were started under glass, and the plants handled in much the same way as described for peppers, and the crop is cultivated and handled in much the same manner. This crop, as well as the peppers, requires a rich soil and thorough cultivation. These plants require more space in the field than do peppers, as they grow larger and have a much stronger root system. The rows were planted 3 feet 8 inches apart, and the plants about 34 inches apart in the rows.

The same result applies for this crop as has been mentioned for the other crops; the season being warmer and longer than ordinary, the yield was unusual.

This vegetable is not very well known in the majority of markets; we were able to increase the sales to a great extent by having printed circulars describing how to treat and cook this vegetable, placing a few of these in each box when they were packed. This apparently is causing a rapid and continued increase in the quantity sold to the different dealers.

CANTALOUPES GROWN, 1917.

At the home station this last season only a small quantity of melons were grown, chiefly for the purpose of testing new varieties, while the commercial crop was grown on a farm near by which was rented from the owner, who was at the Front. The season being warmer than usual, the cantaloupe-crop was a remarkably good one, the fruits being much larger than usual, causing the yield to be better than in previous years, a net return of about $870 per acre being realized. The seeds were started in sand on April 19th, and the plants transplanted three times before setting in the field the first week of June, after which they were given very thorough cultivation. As soon as the fruits began to ripen they were gone over every week-day and all fruits from which the stems would slip with reasonable pressure were gathered.

For the main crop the variety called "Hoodoo" was grown, but this was crossed with a much larger and earlier variety, and, judging from the first cross, it will be possible to obtain from this a larger and earlier sort, which will be very desirable if the flavour and shipping qualities of the Hoodoo can be maintained as we hope.

There is a wide market available for this crop if the right varieties are properly grown and marketed; there is little fear of overproduction, as is the case with cucumbers and some other crops.

CUCUMBERS.

From $1^{4}/_{9}$ acres of cucumbers there were harvested 5,445 peach-boxes of fruits at a total cost of $1,281.90, which sold for $3,728.30, leaving a net balance of $2,446.40.

The seed used was a three-year selection of our own, starting with some saved from selected plants grown from seed of Stokes' Hothouse Perfection, and no doubt the selection of seed used contributed somewhat to the heavy yield of uniform fruits that was obtained. The seed was planted in sand on April 18th, and the plants transplanted three times before taken to the field in the first week of June.

About $^{1}/_{3}$ acre of the above amount was grown from seed planted on May 21st directly in the field; these were given extra care and nursing in an endeavour to produce a profitable crop in that way, but with all the care the crop failed to develop until the market was well supplied and the price such that the average was reduced to such an extent that it is not the intention to grow any more in that way. These, as well as the plants started under glass, were grown in rows 4 feet 8 inches apart, the hills, containing one plant each, being 3 feet 6 inches apart in the rows. The whole plot was cultivated about once a week for nearly the whole of the growing season and was kept fairly well irrigated, but if more water had been available it is thought the crop could have been increased by at least 15 per cent.

As the weather was much warmer during the past season and continued for a longer period than usual, the crop of cucumbers, as well as that of the other warm-season vegetables, was

better than ever before, but this was partially due to the fact that the same plot of land has been used for these crops for four years, and each season the land given a more thorough preparation than the last, including a fair application of well-rotted stable manure which is not all used by the crops the first season.

Each year, as soon as the crops are harvested, the old vines which produced them are removed and the land given a good working with a spring-tooth or orchard cultivator, then whatever manure is available is applied and worked into the soil by more cultivation; the land is then well ploughed late in autumn. In the spring, as soon as the land is in good condition, it is well cultivated again, and the plank drag used to pulverize any small lumps that have formed; it was then ploughed, plank-dragged again, and before planting the cultivator and planker passed over the plot once more. The soil being a gravelly loam, the amount of labour used in preparing the land for vegetables would be too much for a very sandy soil, but there is no doubt that it will pay well on most soils.

(For statement showing receipts and expenditures in connection with the station during the year 1917 *see* Appendix No. 5.)

Respectfully submitted.

J. L. HILBORN,
In Charge.

ANNUAL REPORT OF PROVINCIAL PLANT PATHOLOGIST.

J. W. EASTHAM.

W. E. Scott, Esq.,
Deputy Minister, Department of Agriculture, Victoria, B.C.

SIR,—I have the honour to submit herewith my annual report for the year 1917.

NEW DISEASES.

A fairly comprehensive plant-disease survey has now been made of the fruit-growing districts of British Columbia, and the diseases at present to be found or to be guarded against recorded. No new disease of economic importance has been noticed during the past year. The only observation worthy of being recorded during the past season is the occurrence of a case of mushroom root-rot in an apple-orchard in the Shuswap District. The main axis of the tree from the crown downwards was completely rotted by the fungus, the mycelium of which was obvious to the naked eye all through the rotted tissues. The characteristic rhizomorphs were also present in abundance. The owner of the orchard complains that nearly his whole orchard is dying from apparently the same cause. Unfortunately this case was brought to the attention of this office too late in the season to visit the place, but the disease is of sufficient interest and importance to warrant some attention next season. This is the first authentic case of the diseases from the Mainland, although your Pathologist has looked very carefully for it, as it is well known in the Pacific Coast States. The fungus apparently is present on the roots of the natural trees and shrubs of the bush, and the only way of avoiding the disease in the orchard would appear to be the removal of the old roots, etc., from soil as completely as possible, and the growth of field crops on the land for two or three years before planting out to orchard. Not only apple-trees, but most varieties of fruit-trees and some bush-fruits are liable to be attacked.

FIELD EXPERIMENTS.

Apple-tree Anthracnose.—Last year an experiment was begun, in co-operation with the Horticultural Branch, to ascertain the relative value, in the control of this disease, of spraying at different dates in the fall. It is known that the disease can be largely controlled by fall spraying, but that this work must be done before the heavy fall rains begin, since it is through these rains that infection with the fungus takes place. With late varieties, however, to be sure of spraying in time, it is necessary to do this before the fruit is picked. Growers have been averse to this, since it means extra trouble and expense in wiping the fruit. The experiment was designed to test the relative efficacy of spraying before and after the rains had begun and the extra cost in the former case. It was necessary, therefore, to use a late variety susceptible to the disease.

A summary of the results of the first season's work was published in the *Agricultural Journal*, and it is only necessary to state here that the results were decisively in favour of the early sprayings. When trees had one spraying given on September 6th, only 11.4 per cent. of the first- and second-year-old growth was attacked by anthracnose, whilst on those not sprayed until November 8th, 77 per cent. was attacked. Where both sprayings were given the infection was 7.2 per cent. These figures show well the relative value of the two sprayings, which is further emphasized by the fact that most of the infections on growth of this age result in the death of the branch above the point of infection.

The most surprising thing, however, was the fact that no extra charges were incurred in handling the fruit as a result of the adhesion of Bordeaux mixture. The apples were placed in cellar storage until after Christmas, and when they were then packed the Bordeaux mixture was found to have disappeared, possibly having been detached as a consequence of the sweating of the fruit.

The experiment is being continued, and will probably have a still greater advantage for the early spraying as the disease comes more under control.

In this connection it is of some interest to note the curious ideas which an ignorance of the real cause of a parasite plant-disease still renders possible. A certain gentleman having memoralized members of the Cabinet and others in reference to a specific remedy which he had discovered for anthracnose, I made an investigation of his claim. The method of procedure consisted in slitting up the developing cankers in eary spring, and injecting by means of an oil-can a coloured liquid, whose composition is a profound secret. This method of treatment ignores altogether the fact that infection takes place in the fall, and that the canker ceases to extend by the time growth has well begun. Naturally, therefore, the canker does not develop much after treatment, as it is due to stop in any case. On the other hand, such treatment can have no influence in lessening new infection. It is known that shaving off the surface of a developing canker and allowing it to dry out will check it, but this would only be of practical value where the cankers are small, at which time they are not easy to see. In any case, the process is too tedious to be of much value, and it is more important to prevent an infection than to treat the cankers after they have developed. Effective protection can be obtained by spraying as in our experiment.

Apple-scab.—Apple-scab was not so prevalent this season as in 1916, and the results of our experiments last year had convinced many growers, who had become discouraged, that scab is a controllable disease. As a consequence spraying has been more extensively and more carefully practised. From the nature of the case it is not possible for the Plant Pathologist to be present personally at the picking and counting of the crop on all the experimental plots. This year he devoted most of his attention to the experiment in the Kootenay, since it is there that the disease is of most economic importance. The results at Nelson were not as good as those obtained in 1916, owing probably to the fact that it was necessary to have some of the spraying this season done by Chinamen. It is probably not desirable to give a full account of the results here, but the following contrast between two McIntosh trees, one sprayed "commercially" (that is, three sprayings, "pink," "calyx," and two weeks later), and a check-tree, may be given:—

	No. of Apples.	Total Weight.	Weight Clean.	Weight Scabby but Marketable.	Weight of 60 Best.	Weight of 50 Worst.
		Lb.	Lb.	Lb.	Lb.	Lb.
Check	459	65	...	13	13	3
Three sprays	611	143	89	39	19	9

Although the check-tree was, if anything, more favourably placed than the other, it had not a clean apple on it, whilst the greater proportion of the fruit was absolutely useless for any purpose whatever, as may be judged from the fact that the fifty worst apples weighed less than 1 oz. each. It was also difficult to pick out the worst, there being so little to choose amongst them. On the sprayed tree 58 per cent. of the apples by count and 62 per cent. by weight were perfectly clean, and a further 31 per cent. by count and 27 per cent. by weight, although slightly scabby, were still marketable.

Another interesting feature is the greater set of fruit on the sprayed tree. It has been contended that the use of lime-sulphur in the "pink" stage or later is likely to bring about a serious dropping of the fruit. None of our experiments to date have indicated this, although for the "pink" spray a solution of 1-30 was used, probably somewhat stronger than necessary for scab-control.

The past season at Creston was not so conducive to scab as that of 1916, but there was sufficient to demonstrate the value of spraying. Owing to some misunderstanding on the grower's part, this office was not informed in advance as to date of picking the fruit, and therefore no detailed analysis of results was possible. Field observations made on August 18th showed that where two or more sprayings had been given, no scabby fruit could be found and very little scabby foliage. On the check-trees 75 per cent. of the fruit was scab-infected, although in most cases not sufficient to materially reduce the size, only the market grade.

Peach-worm, or Twig-borer (Anarsia lineatella).—This insect is becoming a most serious pest of the peach and apricot crop in the Southern Okanagan. It is only recently that it has begun to attack apricots, and apparently still prefers peaches. Where the latter are few in number, however, apricots are being very seriously attacked, and where the insect is on the increase its attacks on apricots are becoming more frequent. This is much to be regretted as the apricot has hitherto been a crop much in favour with the growers, not only on account of its value as a market crop, but owing to its comparative freedom from pests and disease.

The peach-worms winter over in the larval stage in the crotches on the upper part of the tree. In spring these worms eat the young growth, hence the name "twig-borer." These larvæ pupate on the tree and give rise to a moth, and the eggs then laid give rise to another generation of larvæ which attack the fruit. It is this attack on the fruit that is chiefly serious with us. Numerous observations in the Southern Okanagan have convinced your Pathologist that where spraying with lime-sulphur is done as required for peach-leaf curl, this will largely control the twig-injury from over-wintering larvæ. This is confirmed by the experiments at Summerland carried out by J. Tait, Inspector for that district. Hardly a worm could be found at this stage on the sprayed trees. Since, however, the moth is winged, such spraying gives no protection against the brood which enters the fruit, since the female can migrate from any near-by unsprayed orchard to lay her eggs. Moreover, it is much more difficult to protect the fruit by spraying against this phase of attack. There is good reason to believe that one thorough spraying of peaches, apricots, and perhaps prunes, with lime-sulphur, between the time of the first swelling of the buds and the appearance of the pink of the blossom in the opening buds, would control the pest; but it is absolutely essential that all trees of these species be treated. Control of this pest is as much a community matter as is that of fire-blight. The difficulty, however, lies in the presence of so many abandoned lots with peach-trees, especially in the vicinity of Summerland. The simplest and most satisfactory means of dealing with these would be to cut them down and burn them, but this is perhaps rather a drastic measure. It may be that the shortage of water during the past season will help to give the finishing touch to many of these trees. It is certainly advisable that spraying with lime-sulphur, not weaker than 1-12, between the time of the first swelling of the buds and the showing of the petals be practised for peach and apricot trees in the districts of the Southern Okanagan from Peachland south to Keremeos.

The share of the actual spraying operations which it is necessary or desirable that the Government should undertake cannot be decided upon until certain data, which are now being collected by the district horticultural officers, can be worked over. These include the number of trees to be sprayed and the number of machines available in the areas under consideration. In any case, it is intended to conduct an educational campaign through the medium of institute meetings and through the press in the early part of the year.

FIRE-BLIGHT.

A considerable amount of fire-blight was present in the Okanagan during 1917, although it did not assume the proportions of an epidemic. There was apparently a little primary infection of the blossoms, which developed slowly, forming a focus for numerous secondary infections on the twigs later in the season. The late development of the disease prevented the injury from becoming as serious as would otherwise have been the case. Much of the trouble is to be explained by the absence of skilled labour to cut out the dormant cankers or to detect and remove the earliest infections.

The worst injury, however, from fire blight was at Grand Forks, and apparently due to deliberate neglect. Many of the farmers there have replaced much of their orchards by agricultural crops. Those who intend continuing this process are apparently very negligent of what happens to their trees, as they intend to take them out, anyway. Unfortunately, while they remain in this neglected condition they are a menace to those orchardists who wish to make the most of their fruit land. The worst fire-blight infection seen this season was in a block of Transcendent crabs here. As the grower proposes to take them out this winter, a fruitful source of infection will thus be removed.

POTATO-DISEASES.

In view of the increased importance of the potato-crop as a source of food-supply at the present time, it is very regrettable that so much disease should be present with the 1917 crop. Much loss occurred in the field and during transit, and it is to be feared that there will be a large shrinkage in storage.

In the past two seasons, owing to the increase in the powdery-scab infestation, attention has been given by this Branch to bringing before the growers the necessity of more care in the selection of seed free from disease, and the advantage to be derived by disinfecting the seed as a safeguard against surface-borne diseases. Early last spring a special circular was prepared, giving detailed instructions for treating seed. This was widely distributed. Seed-disinfection, however, is no safeguard against internal diseases, and owing to the scarcity of seed last spring it is to be feared that much seed of an unsatisfactory character was employed. The diseases which have caused so much loss this season have not been the surface-borne ones, but the internal ones, especially late blight and certain *Fusarium* rots.

LATE BLIGHT.

Late blight has been very widespread. Specimens of tubers affected with it have even been found in potatoes from the Ashcroft area, although the Dry Belt is usually quite free from the disease. There is only one effective control measure—namely, the spraying of the tops with Bordeaux mixture three or more times during the season. If the disease can be controlled in the tops the tubers will not be affected. In Eastern Canada this practice has now become well established owing in part to the presence there of the Colorado potato-beetle. This pest is so destructive that unless the grower sprays for it he will get no crop. Since he has to spray for this in any case, it is comparatively little extra trouble to add Bordeaux mixture to the Paris green and control both the potato-bug and the late blight. It has, of course, been objected that since late blight does not occur in epidemic form every year, the money spent on spraying may be thrown away. It has been shown, however, by repeated experiment that, even when no blight should occur, the spraying pays for itself in increased yield. Bordeaux mixture has a stimulating effect on the foliage, resulting in more assimilation and a longer growing season, and hence in the larger yield. Whether this would be true or not with the present high cost of production, it is difficult to say.

FUSARIUM ROTS.

Several of these have been determined, and the amount of loss, especially in transit and in storage, due to these diseases is very great. *Fusarium* rots take the place in the Ashcroft District of the ever-present late blight at the Coast. Another form is very prevalent in the Delta District. Many field observations have been made and laboratory studies, but experimental field-work is now desirable to settle a number of points in the life-history of these parasites.

SILVER SCURF.

Silver Scurf (Spondylocladium altrovirens).—This disease has been found to be very frequent in the Coast and Island sections. The sclerotial stage, however, has been met with only rarely. While the disease is not very serious, it can only be controlled by seed-selection; although it is of a superficial nature, seed-disinfection does not seem to be effective.

CODLING-MOTH.

Investigations under the direction of R. C. Treherne, Provincial officer of the Dominion Entomological Branch, have now been well advanced. The results of these investigations will ultimately be published by the Dominion Government. At the same time, information for

immediate practical use has been supplied to those officials of the Department employed in suppressing outbreaks of this pest.

When the material being bred through in the insectary at Vernon reached the critical stages, the aforesaid field officers were at once notified and took measures of spraying or banding accordingly. These operations, therefore, were based upon definite knowledge, and not on probabilities affected by the judgment of the individual and the character of the season.

The codling-moth conditions in the quarantined areas of Westbank and Okanagan Landing are showing great improvement. The Westbank infestation is now well under control, only forty-eight larvæ being found during the entire season. These were all found in eleven orchards, fourteen orchards previously infested being found to be entirely free. A further result of the quarantine-work in this district is the clean and healthy appearance of the orchards as a whole and the excellent grade of fruit produced. The rosy aphis of the apple (*Aphis sorbi*), which was becoming a serious pest in this district three years ago, was not observed to be present during the past season.

At Okanagan Landing the infestation has been greatly reduced; the total number of larvæ found during the past season was 550, being a reduction of over 50 per cent. as found in the year 1916. Furthermore, the area of infestation has been greatly reduced, being now confined to two adjoining orchards with a small front yard of about thirty trees still in doubt.

VERNON OFFICE.

This office, as heretofore, is in charge of Mr. Ruhmann, and is the centre for the entomological work of this Branch. The most important piece of work has been the codling-moth investigation, which has already been noticed. Work has also been carried out in co-operation with Mr. Tothill, in charge of Natural Control Investigations in the Entomological Branch of the Dominion Department of Agriculture. In this connection Mr. Ruhmann spent two weeks at Lillooet investigating an outbreak of spruce-bud moth (*Tortrix fumiferana*). This pest was doing much injury in the area specified, and it was important to collect data on its natural enemies, since ordinary control measures are not feasible. Work along these lines was also done with the cherry-tortrix (*Archips cerasivorana*), tent-caterpillars, and oyster-shell scale. In the last-mentioned case a predatory mite collected in Eastern Canada and sent out by the Dominion Entomological Branch was placed out and is being kept under observation, in the hope that it may assist in the control of this pest.

An undetermined species of wireworm was found doing much damage to the onion-crop at Vernon and Kelowna. A bait of rice-bran, molasses, and arsenic was found very effective in controlling it. The materials were mixed to form a stiff dough, and small balls of it were placed just beneath the soil between the rows. These proved a great attraction, and when examined three days later were found to contain a large number of the dead wireworms.

An apple-miner of a very unusual character was found at Creston and sent in by the Provincial Horticulturist. Only one reference to such an insect could be found in the literature at our disposal, and the insect was not named. It was determined, however, by A. L. Quaintance, of the Bureau of Entomology, Washington, D.C., as the work of a small moth, *Marmara pomonella*, an insect only described in 1915. As this would be a serious pest should it increase, a photograph of its work is appended, and it is requested that specimens of any similar injury be sent to the Vernon office.

The cage used for the past two years for the study of the life-history of the codling-moth has been removed from its site, and will be erected on the grounds at the rear of the Vernon Court-house in the spring of 1918. A further sectional addition measuring 12 x 16 feet is being constructed as an addition to the cage, the cost of the material for this work being borne by the Entomological Branch, Ottawa. This will make a commodious insectary measuring 12 x 28 feet, and will be used for rearing, and studying the life-history of, the insect pests most prevalent in the Okanagan Valley, and will also facilitate the making of life-history sets of economic insects for distribution and exhibition purposes.

The collection of insects has been largely increased during the year. The collection of the late E. S. Wilmot, of Coldstream, has also been donated to us by Mrs. Wilmot. It is strong in specimens of Coleoptera, containing a considerable number of species new to our collection. A collection of Lepidoptera has also been presented by F. B. Jacques, of Vernon. We take this opportunity of expressing our thanks to these donors.

A new sectional insect-cabinet is being purchased for the housing of our collections, the previous accommodation having proved unsatisfactory.

It is gratifying to note that the Vernon office is being increasingly visited by Okanagan growers who are troubled with insect pests or diseases. The absence for a considerable time of any officer in charge, and later the removal of the office from the Smith Block to the Court-house, probably caused some falling-off in personal inquiries, which are in most cases the most satisfactory form of inquiry.

EDUCATIONAL WORK.

In addition to attending various institute meetings, your Pathologist took part in the short course at Summerland in February, as did Mr. Ruhmann, who lectured on insect pests. Your Pathologist gave a series of five lectures on plant-diseases at the short course in horticulture at the University of British Columbia in January and three lectures at the similar short course held in November. In July the summer school for teachers was attended, giving part of the course in botany and also a series of lectures on plant-disease.

Over eighty Riker mounts of plant-diseases have been prepared during the past year and are now being distributed. A number of similar insect mounts have been made up, although the number so prepared have been less than expected. A large quantity of material was collected during the summer of 1916, but most of it failed to survive the Vernon winter in the accommodation available. The new insectary should prevent a similar occurrence in 1918.

Considerable attention has been given to preparing a good exhibit on diseases and insect pests for the fall fairs. Such exhibits were shown at Vancouver, Duncan, Coquitlam, Langley, Kelowna, Grand Forks, Nelson, and Summerland. The exhibit at the Upper Country fairs was in charge of Mr. Ruhmann, except at the last named, where personal charge was taken. Much interest was shown, especially in the fruit-growing districts.

In addition to regular duties, the bacterial tests in connection with the Dairymen's Association milk competition were again made.

In the past the major part of the Pathologist's time has been spent in making a survey of the Province for plant-diseases; in taking up difficulties with individual growers; in going around with District Horticulturists and Inspectors, inquiring into the more obscure or difficult cases of disease; and in connection with the field experiments on anthracnose, apple-scab, peach-curl, twig-borer, etc.

Owing to the extent of the Province, this necessitates being away from the laboratory a great deal, and it is very difficult to keep investigational work going. The spraying experiments now under way should be concluded in 1918.

Respectfully submitted.

J. W. EASTHAM,
Provincial Plant Pathologist.

ANNUAL REPORT OF INSPECTOR OF IMPORTED FRUIT AND NURSERY STOCK.

W. H. LYNE.

W. E. Scott, Esq.,
Deputy Minister, Department of Agriculture, Victoria, B.C.

SIR,—I have the honour to submit my annual report on the inspection of imported fruit, nursery stock, vegetables, rice, corn, beans, and peas during the year 1917.

STAFF.

The work of this Branch has been carried out by a staff of officials recorded as Inspector of Imported Fruit and Nursery Stock, first, second, and third assistants, and clerk-stenographer, stationed at Vancouver. Extra men, under a foreman, have been employed at the fumigation and inspection station, when required, for the work of unpacking and repacking trees, shrubs, plants, etc., during process of inspection and fumigation.

Fruit Inspection Quarantine Officers, under direction of your Inspector, are stationed at Victoria, Nanaimo, Prince Rupert, Abbotsford, Huntingdon, Similkameen, Midway, Grand Forks, Cranbrook, Newgate, Cascade, Kingsgate, Fernie, Rossland, Waneta, Revelstoke, and Bridesville.

At Penticton and Osoyoos, in South Okanagan, and Rykert, near Creston, the Customs Officer at each place looks out for any infected fruit that may be brought across the boundary by way of wagon-road. These three last-mentioned men were employed only through July, August, September, October, and November, during which months there is most danger of codling-moth being brought across the boundary by tourist or other traffic.

THE PEA-WEEVIL FROM EASTERN CANADA AND UNITED STATES.

The pea-weevil (*Bruchus pisorum*) is an insect of considerable economic importance with which this office has had to deal. Owing to the fact that up to the present it has not become an established pest in British Columbia, and knowing the havoc it has caused in Eastern Canada and certain parts of the United States and Europe, every possible precaution should be taken to keep it out. With that aim in view, all shipments of peas entering the Province have been carefully inspected, and if found infected with any sign of live weevil were immediately ordered to the fumigating station at Vancouver or Victoria, where they were thoroughly fumigated with carbon bisulphide at the expense of the importer. This remedy, properly applied, has been found very effective.

During the early part of the year, when several Eastern Canadian seed-houses were shipping in their spring garden seed, considerable trouble and annoyance was caused in having to open sealed packets containing peas. After a diligent inspection of such packets no live infection was found, and in order to avoid further trouble the shippers agreed to furnish a guarantee that all such stock had been properly disinfected. This arrangement was accepted by the Department as applying to sealed packets only, stipulating that the inspection of peas, beans, and corn in bulk should continue, and that freedom from infection of such shipments should govern the concession granted to the sealed packets.

PEA-WEEVIL FROM JAPAN.

Several hundred tons of peas from Japan have arrived at Vancouver, some of the consignments being infected with the live weevil, necessitating prompt fumigation. This illustrates the fact that the Inspectors have to be continually on guard against this destructive insect invading the Province from many directions.

BEAN-WEEVIL.

The bean-weevil (*Bruchus fabæ*) is a very close relative to the pea-weevil, and can be just as destructive. We may congratulate ourselves on being free from this pest in British Columbia for the time being. Consignments of beans infected with live specimens of this insect have arrived at Vancouver and Victoria from California, Peru, China, and Japan. In a few shipments the beans were so badly riddled with the weevil as to be of very little value, and were refused entry. The other shipments were fumigated.

The heavy importation of beans and peas has been largely in connection with Army supplies.

POTATO-TUBER MOTH.

The potato-tuber moth (*Phthorimea operculella*) is another very serious insect pest that has not yet troubled this Province, and for which California potatoes are barred entry into Canada.

On May 8th, 1917, the S.S. "Waitotara" arrived at Vancouver with 9,759 crates of potatoes from Australia badly infested with the tuber-moth. The whole consignment was refused entry and taken to San Francisco, to which port it was originally consigned.

MEDITERRANEAN FRUIT-FLY.

All consignments of fruit and vegetables coming from the various latitudes in the Pacific Ocean are carefully inspected for any sign of the fruit-fly (*Ceratitis capitata*), about the most destructive insect known to many kinds of fruit and vegetables.

All fresh fruit and vegetables from the Hawaiian Islands were barred entry into Canada for reason of this pest. The Hawaiian Islands, however, is not the only place in the Pacific where the fruit-fly exists, and it is never known what shipments arriving from other parts may carry infection.

INSECTS INFECTING RICE, CORN, AND STORED PRODUCTS.

The object of inspecting imported rice, corn, peas, beans, and other cereals, or stored products, not only applies to insects affecting field or garden crops during growing period, but also to those insects that are often so objectionable and injurious to the stored product. The Mediterranean flour-moth (*Ephestia kuehniella*), Indian-meal worm (*Plodia interpunctella*), the Angoumous grain-moth, the flour-beetle (*Tribolium confusum*), Tenebrio worm, rice and granary weevil (insects infecting stored products) have been imported during the year with rice, peas, beans, peanuts, etc. These particular insects do not apparently survive confinement to a cold storehouse, but will flourish and become a general pest in warm stores or storehouses. It has therefore been the practice during the last twelve years to fumigate all imported shipments of rice, corn, beans, peas, etc., that are infected, in order to prevent the imported insects becoming a serious pest in our wholesale and retail stores.

This ruling has had a good effect on recent importations in general, as shipments seldom arrive so badly infected as in previous years.

RICE-MILLERS' PROTEST.

On July 12th, 1917, a meeting of the Board of Horticulture was held at the office of the Inspector in the Court-house, Vancouver, which was attended by a deputation of the Vancouver rice-millers, who presented a formal complaint against the expense and delay incurred in the fumigation of infected rice. They also expressed the opinion that fumigation of rice was not necessary, claiming that all infection was destroyed in the process of milling, and that which escaped into the building did not survive the winter.

After due consideration of the statements made by the rice-millers, the members of the Board decided that, even though the process of milling would destroy the insects in the rice milled, a certain amount of infection would still remain with the sacks. The fact that the insects did not appear to survive the winter temperature of the mills did not prevent the infection being carried from the mills to the stores during the milder seasons of the year. Once the stores were infected, it was often very difficult to rid them of the infection.

There was therefore very good reason why every precaution should be taken to keep the rice-mills free from the objectionable insects imported with the products the mills handled. The Board had no wish to endorse any method of procedure that would work an unnecessary hardship on the millers, but would have to uphold the Inspector in using the proper discretion as to treatment of infected shipments imported.

An experimental concession was granted, allowing the rice-millers to mill certain infected rice direct from the wharf or a quarantined warehouse, and immediately send the empty sacks to the fumigating station. This avoids storing in the mill anything infected, and the method appears to work fairly well if carefully carried out.

EXPERIMENTAL FUMIGATION.

The several methods of fumigating infected products, warehouses, cars, and ships have become a very important undertaking of late years, in order to prevent as much as possible the enormous loss resulting from destructive insect pests and diseases.

During the last two years R. C. Treherne, Assistant Dominion Entomologist, has co-operated with your Inspector in a number of experiments. Hydrocyanic acid, carbon bisulphide, hot air, cold air, steam, and sulphur methods have each been given a trial, and some very good results obtained, details of which would be too long for this report.

It is hoped to obtain in the near future more valuable results from cold-storage experiments regarding rice-infection, which promise to greatly assist in solving the problem of dealing with that product in a satisfactory manner.

FUMIGATION BUILDINGS.

Owing to the necessity for economy, the erection of the new fumigation building at Victoria, for which an appropriation was made, was postponed.

The fumigation buildings at Vancouver were repaired by the Public Works Department to the extent of $200, putting them in fairly good working condition for the time being.

NURSERY-STOCK IMPORTATIONS.

Very little nursery stock arrived from England or any part of Europe, most of the importations coming from the United States and some from Eastern Canada and Japan. There was a larger quantity of apple and pear trees from the United States and some increase in apricot and prune trees, also seedlings.

STOCK CONDEMNED.

The condemnation of apple, plum, and prune trees, blackberry stock and seedlings was not so heavy as the year previous; pear, cherry, grape, and ornamentals about the same, but more apricot, sweet chestnut, and raspberry.

There has been a vast improvement in the nursery stock from Japan, very little having to be condemned, for which the Yokohama Nursery Company deserve great credit.

INSECTS INFECTING IMPORTED NURSERY STOCK.

The following insects were found infecting the several varieties of trees, shrubs, and plants during process of inspection at the fumigating station, Vancouver, and were condemned and destroyed accordingly:—

San Jose scale (*Aspidiotus perniciosus*): On apple, pear, plum, cherry, peach, apricot, chestnut, currant, and ornamental.
European scale (*Aspidiotus ostreæformis*): On apple, plum, cherry, and ornamental.
Oyster-shell scale (*Lepidosaphes ulmi*): On apple and ornamental.
Brown scale (*Lecanium*): On peach, apricot, plum, and ornamental.
Black scale (*Saissetia oleæ*): On ornamental.
Scale (*Aulacaspis rosæ*): On blackberry, raspberry, and ornamental.
Scale (*Chionaspis*): On blackberry, raspberry, and ornamental.
Cottony cushion-scale (*Icerya*): On grape-vine.
Cottony scale (*Pulvinaria*): On gooseberry, currant, and ornamental.
Greedy scale (*Aspidiotus rapax*): On ornamental.
Mealy bug (*Dactylopis destructor*): On plants.
Scale (*Diaspis*): On ornamental.
Woolly aphis (*Schizoneura lanigera*): On apple and seedlings.
Peach-root borer (*Sanninoidea exitiosa*): On peach, plum, and cherry.
Peach-twig borer (*Anarsia lineatella*): On apricot.
Raspberry-root borer (*Bembecia marginata*): On raspberry, blackberry, and rose.
Raspberry-cane borer (*Oberea bimaculata*): On raspberry and blackberry.
Blackberry gall-beetle (*Agrilus ruficollis*): On blackberry.
Blackberry gall-mite (*Diastrophus*): On blackberry.
Phylloxera: On grape-vine.
Fire-blight (*Bacillus amylovorus*): Infecting apple, pear, and quince.
Anthracnose, or bark-canker: Infecting apple, pear, cherry, plum, and ornamental.
Sour-sap: Affecting apple, pear, cherry, apricot, and ornamental trees.
Gummosis: Affecting cherry, plum, peach, and apricot trees.
Root or crown gall (*Pseudomonas tumefaciens*): On all varieties of standard fruit-trees and small-fruit bushes.
Chestnut-bark disease (*Diaporthe parasitica*): Affecting sweet chestnut.
Fungus root-rot: On grape-vines and ornamental trees.
Powdery mildew: On apple seedling, gooseberry, and grape-vine.

IMPORTED NURSERY STOCK MUST COME TO VANCOUVER.

All nursery stock coming into British Columbia, or imported into Canada through a British Columbia port of entry, must be inspected and fumigated at Vancouver Fumigating Station, thus complying with both Dominion and Provincial regulations.

Your Inspector was also appointed a Dominion Inspector under the Dominion "Destructive Insect and Pest Act," and was responsible for the inspection and fumigation of all nursery stock imported into Canada through British Columbia.

AMENDMENT TO DOMINION REGULATIONS.

The Dominion regulations under the "Destructive Insect and Pest Act" were amended during 1917. Owing to the possibility of their carrying the disease known as "white-pine blister-rust," all varieties of currant and gooseberry (*Ribes* and *Grossularia*) are included with other varieties of stock that are prohibited entry into Canada.

FRUIT IMPORTATIONS.

The fact that fewer apples have been imported during 1917, and that a fairly good supply of British Columbia apples has been in evidence at Vancouver, is a good indication that this Province is continuing to make headway in supplying the local market from its own resources.

The importation of Japanese oranges was much less than in the year 1916 owing to the high freight and limited shipping accommodation. Grapefruit and tomatoes were also less. There was not much change in the quantity of plums and prunes, but an increase in crabs, pears, apricots, cherries, peaches, California oranges, and lemons; peaches and California oranges being the most conspicuous.

With the exception of apples and Japanese oranges, there was less fruit condemned than during the previous year.

The apples and pears were condemned for codling-moth principally, and a few for San Jose scale. Peaches, apricots, and plums were condemned for peach-twig borer (*Anarsia lineatella*) and brown-rot. Cherries were condemned for brown-rot. Lemons, oranges, and grapefruit were condemned for scale (*Aspidiotus aurantii, citricola, Chionaspis, Diaspis, Mytilaspis, Lecanium olea*) and brown-rot.

The condemned fruit was all shipped out of the Province, with the exception of a few small consignments that were cremated.

POTATO IMPORTATIONS.

Practically all the potatoes imported have been used by the evaporators, only a few very small shipments being for consumption within the Province. These have been imported from the following places during the year: China and Japan, 94 baskets, or about 3 tons; Florida (new potatoes), 143 hampers, or 4 tons 580 lb.; Washington, U.S., 11,592 sacks, or 651 tons 317 lb.; Alberta, Canada, 585 tons; Australia, 9,769 crates, 4,648 sacks, or 803 tons; total, 2,046 tons 897 lb.

The following potatoes from Australia must be deducted from the foregoing: Refused entry, 9,759 crates, or 500 tons; shrinkage from decay, 174 tons.

Besides the 9,759 crates of potatoes from Australia ex S.S. "Waitotara," which were refused entry for reason of their being infected with tuber-moth, another consignment of 4,648 sacks, or 304 tons, ex S.S. "Niagara," arrived at Vancouver on June 1st, 1917, from Australia for New Westminster evaporator.

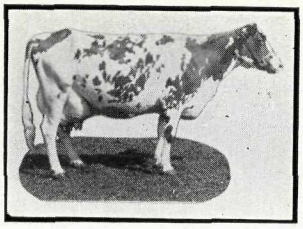
Unfortunately this particular consignment of potatoes was all in sacks, and apparently very little thought had been given to ventilation. By the time they were unloaded it was evident that from 50 to 75 per cent. of the potatoes were so badly rotted as to be absolutely worthless. The result was that the refuse of what had been 174 tons of potatoes was loaded on a scow and towed out to sea.

It would be a very poor business-man who would fail to take advantage of such a practical lesson, and not realize that the only sensible way to ship potatoes under such conditions would be in crates.

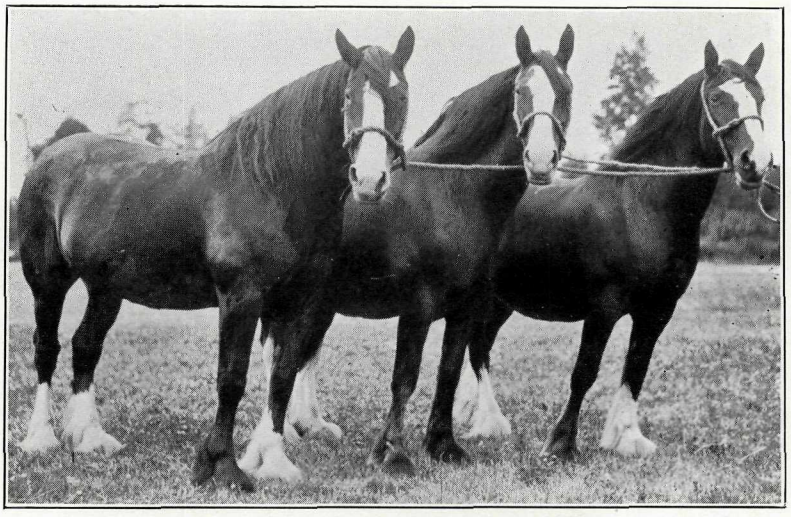
In conclusion, it may be well to state that this Branch has been self-supporting owing to inspection fees collected, the financial sheet for the year showing a good margin in favour of the Department.

Respectfully submitted.

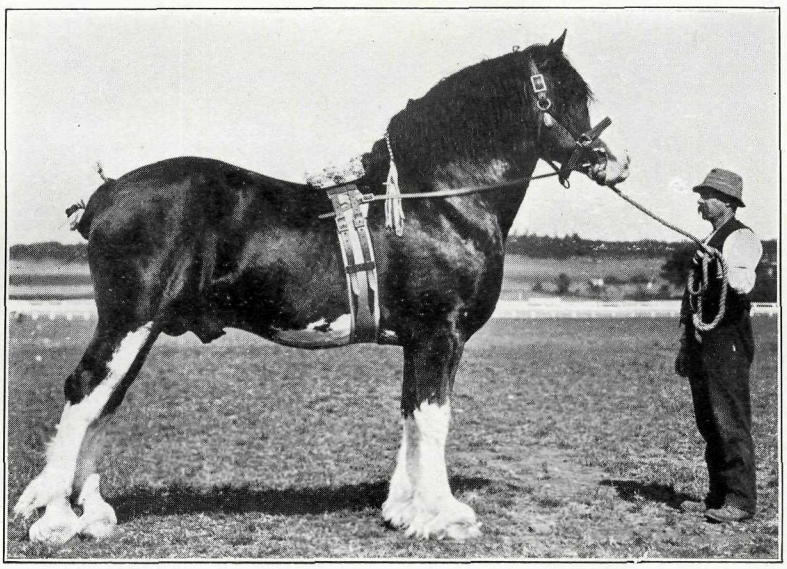
W. H. LYNE,
Inspector of Imported Fruit and Nursery Stock.



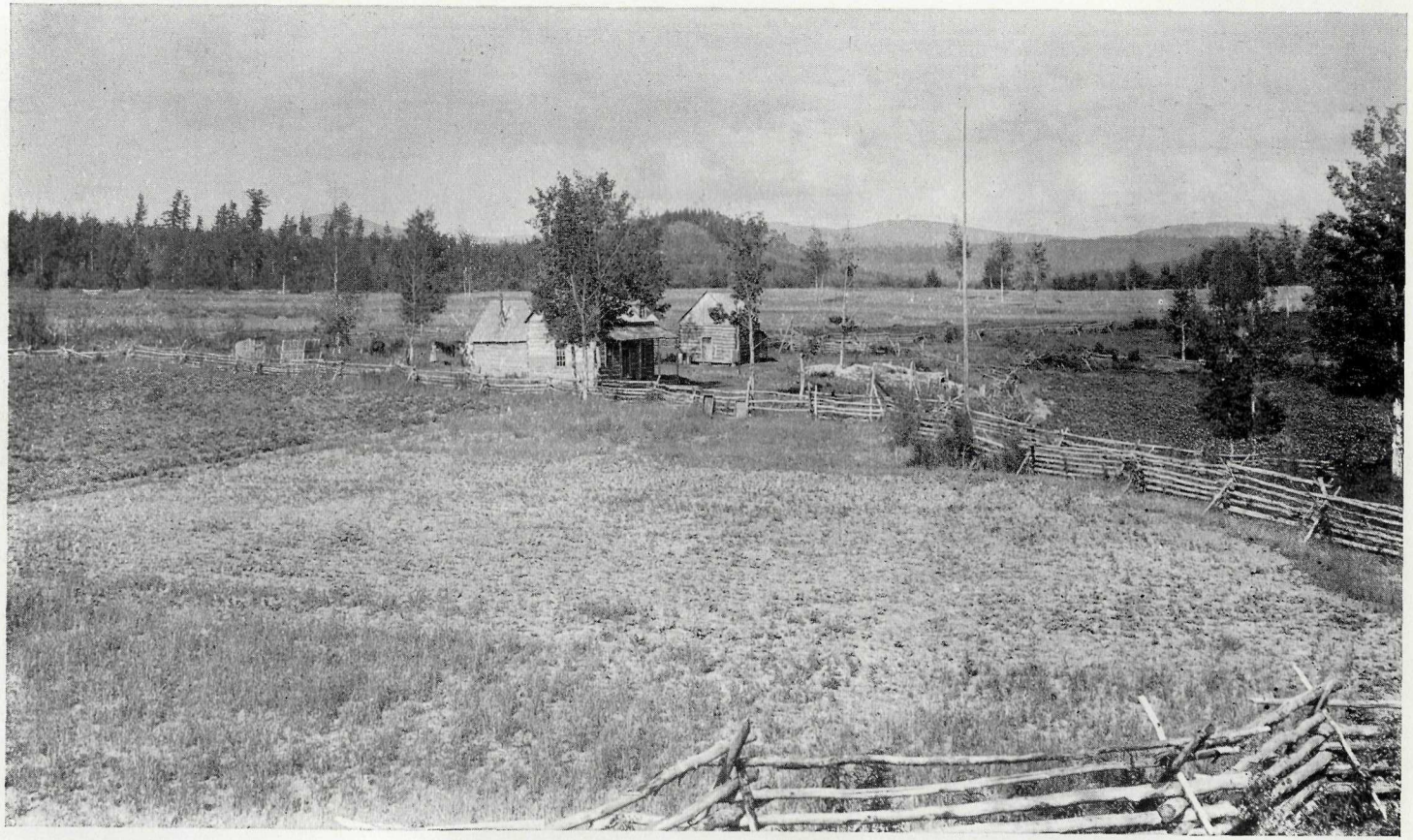
The pure-bred Ayrshire cow "Grandview Rose," 37030, six years old. This cow has established a record of 21,423 lb. of milk and 890 lb. of butter-fat.



Three Clyde mares.



"Baron's Craigie," Clydesdale raised at Westholme, Vancouver Island.



Homestead near Fraser Lake.

ANNUAL REPORT OF LIVE STOCK COMMISSIONER.

W. T. McDONALD.

W. E. Scott, Esq.,
Deputy Minister, Department of Agriculture, Victoria, B.C.

SIR,—I have the honour to submit herewith my report of the Live Stock Branch for the year ending December 31st, 1917.

CONDITIONS.

The abnormal conditions that have prevailed have fortunately not to any great extent at least disturbed the development of the live-stock industry, and, speaking generally, we can say that steady progress has been maintained. Immediately following the opening of the war the rapid advance in the price of grain and other feedstuffs was a disturbing factor, but now an adjustment has taken place which in some cases has meant a change in the methods of feeding, and there is now a general feeling among farmers and stockmen that production must be maintained at the highest possible point.

The labour problem has become a serious factor in determining the extent of the operations of our agriculturists, and in spite of earnest endeavours no satisfactory solution has been offered up to the present moment. Returned soldiers have helped out somewhat, but the number of these men who have taken up farming has been so limited that they have not as yet become a factor in solving the difficulty. Organized efforts are now being put forth to encourage the women to take up farm-work, and I confidently believe that women and girls will help to a marked degree on dairy and other farms, as they have already done in the fruit districts. Favourable reports have been received of the work done by women on the farms in Ontario and elsewhere.

During the year 1917 there has been a tendency in certain districts of the Province, and particularly on portions of Vancouver Island, to reduce the size of dairy herds owing to the price of feed and labour and the difficulty of securing labour at any price, but on the whole we expect a steady increase in the number of our dairy cows. Milking-machines have been installed on a large number of farms, and to a marked degree have helped to solve the labour problem.

Owing to a short hay-supply, with the experience of two severe winters fresh in their memories, some of the stockmen felt obliged to sell more than the usual number of cattle during the past fall, and in a few cases it has been learned that good young breeding cows were sold for slaughter. In most districts the beef cattle went into the winter in very good shape, this being especially true in the Chilcotin and Nicola. Satisfactory prices have prevailed, and throughout the year there have been many inquiries for breeding stock on the part of people who contemplated launching out in the cattle-raising business.

During the past season trouble was experienced in securing bulls for the beef-producing districts, and owing to the apparent shortage and keen demand, prices have been very high as compared with those of a few years ago. Bulls of the quality that could be purchased a short time ago for $100 have during the past year commanded prices ranging from $200 to $300 and even considerably higher.

Unfortunately the limited supply and high prices have had a tendency to encourage the use of some bulls of inferior quality, and so far as can be judged at the present time this condition will be no less acute during the coming year.

To a considerable extent spaying has been practised in the beef-producing districts, and it was generally rumoured that much more than the usual amount was being carried on during 1917. However, investigations showed that if there was any increase in the practice it was comparatively slight.

Owing to the high price of mutton and the extremely high price of wool, sheep production has had a very great incentive, and the numbers within the Province have been steadily increasing. A large part of the 1917 clip of wool was sold for about 60 cents per pound, and there is a firm belief that the price will be even higher during 1918. In addition to the Vancouver Island Flockmasters' Association, the Interior Wool-growers' Association was formed, with headquarters at Kamloops. These two associations have marketed wool co-operatively, and with very satisfactory results. To further improve market conditions for this commodity, the Federal Depart-

ment of Agriculture has established a national wool warehouse at Toronto, and it is anticipated that nearly all of the Canadian wool will be handled in a co-operative manner through this warehouse. It is proposed that the grading shall be done after the wool reaches Toronto. In the cases where wool is to be held for a more favourable market, a liberal advance will be paid to the grower at the time of shipment. As the market for wool is in Eastern Canada and the Eastern United States, it has been agreed that it would be a decided advantage to assemble the wool offered for sale at a point that can be conveniently reached by the buyers.

By Order in Council the Dominion Government removed the duty from breeding sheep imported into Canada for the duration of the war. As a result of this new regulation, many inquiries have been received from sheepmen in the United States who are planning to move their flocks into British Columbia.

In a few sections of the grazing areas a wood-tick has been giving trouble through the fact that it acts as host to a bacterial disease-producing paralysis in sheep, but it is hoped that by systematic dipping this trouble can be overcome.

In certain districts there is an abundance of timber or pine grass, which, though unsatisfactory for cattle, is excellent for the grazing of sheep, and we trust that in the near future flocks can be placed on these areas for the utilization of this feed which is now going to waste. In such cases the difficulty to be overcome in connection with such grazing operations is that of providing winter feed.

Horse-breeding has been at a rather low ebb during the past three years, but we now look for a steady improvement. The surplus of horses has been purchased by the Militia, and also for export to the Prairie Provinces. Towards the spring of 1918 we anticipate that there will be a local demand for horses at good prices. While the tractor has not been used to any great extent on British Columbia farms, we have reason to believe that a number will be purchased during 1918, but it will be some time before they will prove a serious factor in so far as the horse market is concerned.

VETERINARY DIVISION.

In addition to the regular staff of four Veterinary Inspectors, two temporary men were employed in April. The time of these men was devoted chiefly to the tuberculin-testing of cattle and inspection of dairies and stables under the "Contagious Diseases (Animals) Act." During the year, 15,598 head of cattle were tuberculin-tested. These cattle were kept on 1,889 different premises, and 579 reactors and 54 suspects were found. This shows approximately 3¾ per cent. of reactors among the number tested, and is very gratifying indeed when compared with the work of previous years. In addition to the reduced percentage, our Inspectors have found that to a large degree the tubercular lesions are not very extensive. This fact, together with the greatly reduced percentage, justifies the conclusion that the disease may be controlled and possibly entirely eradicated. After investigating the question from all standpoints, we have become firmly convinced that in order to obtain the most satisfactory results the work should be prosecuted in a most vigorous manner. It is highly important that all herds should be tested once a year, and those herds in which disease is found should be tested every three to six months until the disease is entirely eradicated. In this manner those animals which possess the disease in its incipient stages may be detected before the disease has become sufficiently far advanced to prove dangerous to other animals in the herd. The support of the dairymen and farmers to the tuberculin-testing of cattle has been very gratifying, and adds greatly to the efficiency of the work. The intradermal test still continues to give excellent satisfaction as a means of diagnosis.

Contagious abortion has given more or less trouble in our dairy districts, and is almost invariably accompanied or followed by more or less trouble from sterility.

A number of cases of trouble due to the eating of poisonous plants have been reported, but apparently there was less trouble from this source than during the previous year. A considerable number of cases of verminous bronchitis and one outbreak of influenza were handled by the Veterinary Division.

There is a noticeable tendency to improve the sanitary conditions of dairy and other barns, particularly in the older sections, while in many of the newer districts the settlers deserve great credit for the efforts they are putting forth to provide sanitary equipment for the housing of their live stock.

Elsewhere a report of Dr. A. Knight, Chief Veterinary Inspector, gives in full the work of the Veterinary Division.

DAIRY DIVISION.

In spite of a shortage of labour in many localities, the dairy industry of the Province has on the whole made satisfactory progress during the year 1917. In nearly all of the newer agricultural districts of the Province there is a tendency to follow dairy-farming, and in a number of places plans for the building of creameries are receiving consideration.

A new creamery has been established at Kamloops, and G. M. Longhout has developed a very creditable business in the manufacture of fancy cheese, and during the past year has opened a branch factory at Alberni. He repots a very keen demand for his product, and would be able to sell much more than he is manufacturing.

Prices for dairy products have been fairly satisfactory, and it is to be hoped that the granting of permission to manufacture and sell oleomargarine in Canada will not seriously interfere with the butter market. While there may be a place for this product during the period of the war, we are convinced that it is not a satisfactory substitue for butter, nor is it as healthful.

The "Dairies Regulation Act," which provides for Government supervision of the testing of milk and cream where the same is purchased on a butter-fat basis, gives every indication of proving very satisfactory. The chief benefit derived from this Act is due to the fact that it has inspired confidence, which is an advantage to both producer and purchaser.

The Cow-testing Associations continue to do excellent work, and have done more than any other one factor to place the producing end of the dairy industry on a business basis and give the farmer the opportunity of carrying on both breeding and feeding operations in an intelligent manner.

In the month of November the Holstein cow "Zarilda Clothilde III. DeKol," No. 14887, owned by the Colony Farm, completed the highest official world's record for milk production for any age or breed. She produced 30,467.3 lb. of milk in 365 days. "Grandview Rose," No. 37030, owned by Shannon Bros., of Cloverdale, made a new Canadian record for the breed by producing 21,423 lb. of milk and 890 lb. of butter-fat. These new records, added to many other records now held by dairy cows owned within the Province, furnish abundant proof of the natural advantages of the Province and of the progress being made by our breeders.

The British Columbia Dairymen's Association, of which T. A. F. Wiancko is Acting-Secretary, has had the most successful year in its history, and reflects the progress being made in the industry.

Mr. Wiancko's report gives in detail the work carried on by the Dairy Division.

SOIL AND CROP DIVISION.

Co-operative demonstration stations have been carried on under the supervision of the Soil and Crop Division at the following points: Armstrong, Chilliwack, Edgewood, Grand Forks, Rock Creek, Rose Hill, Errington, and Pitt Meadows. Detailed reports of the work conducted on the various demonstration stations will be found in the report of the Soil and Crop Division, submitted by H. O. English and E. W. Hogan, as well as the results of other lines of work conducted by this Division.

Believing that the purpose of most of the demonstration stations had been achieved, it was decided by the Department to conclude the work at all of the above-mentioned points with the exception of Pitt Meadows. This has been the first year in which crops were grown on the Pitt Meadows plot. The results, however, were very striking, and clearly pointed out that much valuable information could be secured by a continuation of the work and a verification of the results of the past year. The value of an application of barnyard manure and lime was clearly demonstrated throughout the growing season and in the yields obtained.

Equipment for demonstration-work in underdrainage, clover and alfalfa hulling, and seed-cleaning is now in the possession of the Department for the use of the Soil and Crop Division. The seed-cleaning demonstrations have been especially satisfactory, and promise to achieve marked results in awakening farmers to the value of the use of good seed.

The field-crop competitions were conducted along similar lines to those followed in previous years, with the exception that the number of entries required in each competition was increased

from six to eight, while the total amount of prize-money paid in each competition was reduced from $45 to $30. A special prize, consisting of ten of the best agricultural periodicals, was awarded to the Farmers' Institute conducting the most successful competition, while a special machinery prize was offered where, in the opinion of the judges, a special prize was warranted. In connection with field-crop competitions, valuable information has been secured in regard to the cost of production of the various crops.

Seed fairs were conducted at the following points: Armstrong, New Westminster, and Duncan. Although this was the first seed fair held at Duncan, the exhibits were very creditable in both number and quality. These fairs should prove an important factor in educating our farmers along the line of seed selection and production.

Co-operative variety tests were conducted with the following crops: Wheat, oats, barley, corn, potatoes, flax, and sugar-beets. Altogether, 1,757 samples were distributed. The main purpose of this work is to determine the suitability of various varieties for the different districts in the Province.

POULTRY DIVISION.

Following the beginning of the war and the incidental advance in the price of grains, many of our poultrymen greatly reduced their breeding flocks, with the result that for a time the poultry industry of the Province appeared to be somewhat disorganized. Now, however, we find that the industry is again on a substantial basis, and our poultrymen are giving closer attention to the cost of production, and where practicable to do so are growing a large amount of the feed required. The price of eggs during the past year has been relatively high, but the advance has not been in proportion to the advance in the price of grain.

The poultry-shows have shown a splendid improvement in quality. The grouping of the various local Poultry Associations for the purpose of holding district shows instead of local shows has proven satisfactory. The Provincial Show and Convention of the British Columbia Poultry Association were held at Kamloops this year. It has now been decided to permanently locate the Provincial Show at Vancouver.

The International Egg-laying Contest still continues to be a most satisfactory feature of the work of the Poultry Division. A detailed report of the contest ending in 1917 will be found in the report by J. R. Terry, Chief Poultry Instructor.

The British Columbia Poultry Association, through its central organization and its locals, has been carrying on a good work in the interests of the poultry industry.

DISTRICT AGRICULTURISTS.

During the year two of our three District Agriculturists have resigned: J. H. McCulloch, of Kamloops, resigning on June 20th, 1917, and H. E. Walker, of Prince George, resigning on November 15th. On the resignation of Mr. McCulloch, George C. Hay, who had been stationed at Smithers, was transferred to Kamloops. These District Agriculturists have been doing good work as representatives of the Department of Agriculture, and are able to get in close personal touch with the farmers, thus forming a connecting-link and adding much to the efficiency of our work. Owing to the scarcity of suitable men we are finding it difficult to extend our organization along this line, but it is to be hoped that in the near future all agricultural districts of the Province will have a representative of our Department.

On April 1st, 1917, the two dry-farming stations, located respectively at 105-Mile House and Quilchena, were transferred to the Department of Agriculture and placed under the supervision of the District Agriculturist located at Kamloops. An effort is now being made to manage these farms along self-supporting lines, and a larger amount of stock is being carried on them than heretofore. From the time they were first operated much valuable information has been secured from the experiments conducted, and the yields obtained have been very satisfactory, and in some cases surprisingly heavy.

Prior to Mr. Walker's resignation he spent one month in making an inspection of the Peace River District. His report is very instructive indeed, and will be a valuable acquisition to the Department. The character of this report and the information it contains will abundantly justify the publication of it in pamphlet form. The thanks of the Department are due to Mr. Walker for the thorough and efficient manner in which he secured such information as he has presented in his interesting report.

Owing to the territory which the District Agriculturist is now endeavouring to serve from his office at Kamloops, the Department decided to purchase a Ford motor-car for his use. By this means he is able to cover a large territory in a more or less effective manner, and reports from various sources indicate that his services are very much appreciated throughout the district. (For further details *see* Mr. Hay's report.)

SILOS.

In 1914 the Live Stock Branch inaugurated a campaign for increasing the number of silos. A very liberal estimate places the number of silos in the Province at that time at about fifty, while to-day there are approximately 525, and of this number the representatives of the Live Stock Branch have erected fifty-three. The campaign has now made such marked progress that we are confident there will be a great increase in the number of silos built during the year 1918 over that of any previous year, and we are convinced that within a comparatively short time nearly all of our dairy-farmers will be using silage. In addition to corn, a number of crops have been used for silage, among them being clover, alfalfa, oats, peas and oats, vetches and oats. The range of crops that can be used makes the silo practical for almost any district in the Province. In certain districts it is being made use of to store crops which are cut for hay during wet weather. Silage is not only valuable to provide succulent feed during winter months, but also to supplement pasture during the dry months of summer. We consider the campaign to popularize the use of silage as one of the most valuable lines of work conducted by the Department, and the results achieved have been, indeed, gratifying. (For further details *see* report of R. J. Ferris, Silo Demonstrator.)

BRANDS.

During the year 1917, 414 horse-brands and 583 cattle-brands were recorded. In the new "Brand Act" of 1917 provision was made for the licensing of all dealers in hides, and a large number of licences were granted. The stockmen of the Interior of the Province have been particularly desirous that Indians be required to record their brands. I am pleased to report that W. E. Ditchburn, Chief Inspector of Indian Agents for British Columbia, has been heartily in accord with this movement and has given every assistance. It is expected that, without making any change in Dominion legislation, the Indians, acting upon the advice of the various Agents, will have all brands recorded. At the present time nearly all the brands on some of the reservations have been recorded.

BOYS' AND GIRLS' CLUBS.

During the year 1917, thirty clubs were organized, with a membership of 474. The following competitions were conducted: Poultry-raising, 23; pig-raising, 5; calf-raising, 1; potato-growing, 11. The results achieved by means of Boys' and Girls' Clubs have been very gratifying, and we consider the value of this work second to no other line of agricultural education. Not only does it stimulate to a very marked degree an interest in agriculture on the part of the boys and girls, but, in addition, through these competitions the adults usually become interested as they would by no other means.

Owing to the urgent demand of other duties, it is impossible for your Commissioner to devote the personal attention to this work which its importance justifies.

BRITISH COLUMBIA STOCK-BREEDERS' ASSOCIATION.

The Stock-breeders' Association held a most successful convention in Victoria during the past year, and its members are keenly alive to the various problems brought about by the war. At all times the association has shown an earnest desire to support the Live Stock Branch in its efforts to bring about better conditions and to promote a campaign for more and better live stock.

Five delegates from this association attended the annual convention of the Western Canada Live Stock Union, which was held in Regina, and where many important matters of vital interest to the live-stock industry and to agriculture in general were considered and dealt with. While originally formed for the purpose of securing more equitable representation for the West in the Dominion associations, the objects of the Western Canada Live Stock Union have been extended to include all problems that have to do with the betterment of agricultural conditions, and it has

been able to give valuable assistance to both Federal and Provincial Governments in advising on matters of legislation. It has also been successful in securing more favourable transportation rates and facilities.

BRITISH COLUMBIA GOAT-BREEDERS' ASSOCIATION.

During the past year there has been organized a British Columbia Goat-breeders' Association, of which George Pilmer, Secretary of the Live Stock Branch, has been elected Secretary-Treasurer. Owing to an increasing interest being taken in goat-breeding, particularly in regard to milch goats, it was deemed advisable to organize for the purpose of harmonizing all interests concerned and for mutual encouragement and benefit. The members now number 176, and at the Vancouver Exhibition in August, 1917, a most creditable exhibit of milch goats was held under the auspices of the Provincial Association.

As a result of the Provincial organization, the British Columbia goat-breeders have been successful in securing the organization of the Canadian Goat Society, which has made arrangements for the recording of pedigrees, and has secured the recognition of the National Records Board. This achievement on the part of the British Columbia breeders will place the goat industry throughout Canada on a firm basis. Mr. Pilmer is Secretary of the Canadian Society.

FARMERS' INSTITUTES.

The various members of the Live Stock Branch have assisted in Farmers' Institute meetings throughout the Province, and also in judging at fall fairs.

Respectfully submitted.

W. T. McDONALD,
Live Stock Commissioner.

ANNUAL REPORT OF DAIRY INSTRUCTOR AND INSPECTOR.

T. A. F. WIANCKO.

W. T. McDonald, Esq.,
Live Stock Commissioner, Department of Agriculture, Victoria, B.C.

SIR,—I beg to submit herewith my report as Dairy Instructor and Inspector for the year 1917.

DAIRY INDUSTRY.

The dairy industry may be said to have been in a fairly healthy condition during 1917, and when full reports are to hand it is expected that a small increase in total dairy production will be noted.

Weather conditions were not always favourable to dairying. The winter season was one of unusual severity, and thus, coupled with high-priced grain and mill feeds and an inferior quality of hay owing to wet weather during the hay harvest of 1916, had a measurable effect in decreasing the winter milk-flow. Spring opened up later than usual, further depleting the winter feed-supply and also occasioning late spring pasture. This was, however, greatly offset by good growing weather in May and June, resulting in abundant forage until well on into the summer. Dry weather during August and September was rather severe on the dairyman who through lack of foresight failed to provide supplementary feeds. A fine, mild, and open autumn helped out considerably in lengthening the period of heavy milk-flow, and resulted in a great saving of winter feeds for the present winter season.

The labour problem has been one of the most perplexing that has ever confronted the dairyman. Owing to heavy enlistment from the agricultural population, the securing of satisfactory help on the farms has been most difficult and in many cases impossible. Mechanical milkers have come to the assistance of many of the more prominent dairymen, and many of them declare that without them they would be obliged to largely curtail their dairy operations.

PRICES FOR DAIRY PRODUCTS.

Butter prices have been higher the past season than ever before reached in Canada, resulting in reasonable returns to cream-producers, notwithstanding high prices of feed and labour.

Prices for British Columbia Cheddar cheese also have been very satisfactory, ranging from 23 to 26 cents wholesale. At these figures it has been found profitable to make cheese in competition with cream prices in some districts.

Milk prices on the whole were more satisfactory during the past year than in 1916. This is especially true on the Lower Mainland, where, owing to proper organization in a co-operative way, the producers held the prices at a point that ensured a reasonable profit over actual cost of production.

CREAMERIES.

The regular inspection of creameries has received as much attention as time would allow, and the majority of them were visited at least twice during the year. Continued improvement in the quality of British Columbia creamery butter has been noted. Makers are showing a more intelligent interest in their work and a desire to improve. Several creameries have installed improved pasteurizing apparatus during the past season, and several others have commenced a system of cream-grading. With intelligent grading and pasteurization, there is no reason to fear competition from the finest grades of imported butter. Sanitary conditions at the creameries were found to be quite satisfactory.

During the year a new creamery has been established at Kamloops. The Abbotsford Creamery has been closed, and the Clayburn Creamery has been opened up in the old stand of the Meadowbrook Creamery, consequent upon the removal of the latter to Vancouver early in the year.

Many inquiries have, as in former years, been received relative to the opening-up of new creameries in new districts. This indicates that the number of dairy cows is increasing in the newer districts, and that settlers regard dairying as one of the safest methods of getting a start on the land. In a number of cases your Instructor, after careful inquiry, has recommended that the matter be left over for a year at least, in order that a sufficient number of cows be available to make the venture a success from the start, bearing in mind that a premature creamery has so often been the cause of a serious set-back in such districts. It is much better to postpone action in such cases for a year or so and encourage the shipment of cream to existing creameries even at great distance. Your Instructor is convinced that the policy of more or less centralizing the business is the only one suitable for a large portion of the Province at the present time. Patrons then have the advantage of a larger output of butter of a uniform quality, thus reducing the cost of manufacturing and correspondingly decreasing the chance of failure.

A list of the active creameries and condenseries of the Province is given in Appendix No. 8; also a summary of creamery report for the year 1917 in Appendix No. 9.

CHEESE-MAKING.

During the year the Ferrara Cheese Company, Limited, established a factory for the manufacture of fancy cheese at Chilliwack. The Dominion Experimental Farm at Agassiz has continued to make up a large part of the milk produced on the farm into Stilton, cream, and other fancy cheese. G. M. Langhout, of Colquitz, manufactures a very fine quality of Gouda, Swiss, and other fancy cheese, amounting to about 1 ton per month. Besides these, quite a number of private dairies make small quantities of cream and cottage cheese, which finds a very ready sale. Since importation of fancy cheese has been very largely curtailed by reason of the war, there is a great demand for that of local manufacture, and it would be to the advantage of our dairymen to further increase the supply.

Cheddar or Canadian cheese has also received some attention in a small way. The creamery at Revelstoke has manufactured a few thousand pounds. The Fraser Valley Milk Producers' Association have turned a considerable quantity of this surplus milk into cheese during the flush season.

CITY DAIRIES.

Owing to other duties, not quite as much time was allowed for the inspection of city dairies and milk-vending establishments as formerly. Generally speaking, these are in a fairly good sanitary condition, and continue to show improvement in the way of new and up-to-date equipment and facilities for rapid handling.

At the present time the Vancouver City dairies are considering the advisability of amalgamating or combining in order to improve the distributing end of their business. Great waste

of time, energy, and money has taken place for years past, due to the multiplication and duplication of milk routes and excessive costs in handling. It is felt that a very material saving can be effected by a proper organization of the business under one or two heads, resulting in the reduction of the price of milk to the consumer, as well as allowing a fair margin of profit to the producer.

COW-TESTING ASSOCIATIONS.

The Cow-testing Associations at Chilliwack, Langley-Surrey, Delta, and Comox have had a satisfactory year, and at each centre a number of farmers are awaiting a chance to become patrons should there become any vacancies. This in itself is an indication of the hearty way in which the work is being appreciated. Great difficulty has been experienced in securing efficient testers, or Supervisors, owing to the general scarcity of help and high prices being paid for ordinary labour. At the present time three out of the four Supervisors are returned soldiers, and the fourth is a man who is unfit for military service. All are rendering satisfactory service.

This work could be largely extended and increased if suitably trained men were available as Supervisors, and at this time there is an opportunity for the training of returned soldiers for the work.

Referring to the work of the Cow-testing Associations in British Columbia, in an address before the Annual Convention of the British Columbia Dairymen's Association at Nanaimo in January, 1917, Geo. H. Barr, Chief Dairy Division, Department of Agriculture, Ottawa, said: "I think this Province is doing better work than any other Province in Canada in cow-testing. I think that at the present time the method followed here is the simplest and cheapest that will get the largest number of men interested in the work."

The British Columbia Dairymen's Association have for the past three years given prizes for the greatest production of butter-fat by individual cows in the several associations. Three prizes (first, $10; second, $6; third, $4) were given in each of two classes for each association. Appendix No. 6 gives the records of the prize-winners, and indicates very forcibly the productiveness of some of our grade dairy cows.

OFFICIAL TESTS.

Testers are still being supplied for Holstein Advanced Registry tests, and during the past years such tests have been carried on at the Colony Farm, Essondale; Experimental Farm, Agassiz; and the farms of Dr. S. F. Tolmie, Victoria, and J. M. Steves, Steveston.

Two noteworthy official records during the year are those of cows owned by the Colony Farm, Essondale, as shown in Appendix No. 7.

CANADIAN NATIONAL RECORD OF PERFORMANCE.

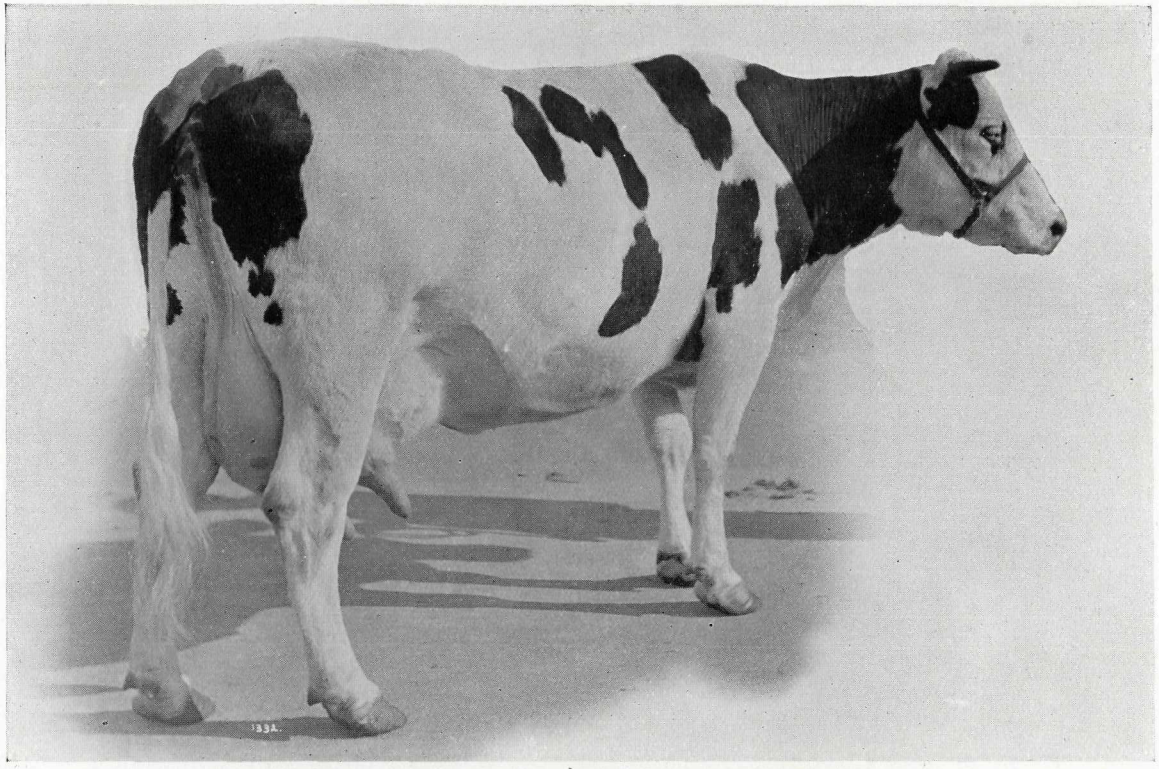
The value of this national record for pure-bred stock, conducted by the Dominion Live Stock Branch, continues to be recognized by British Columbia breeders. About fifty-six dairymen have had cows entered during 1917, as against forty-four and thirty-five in the years 1916 and 1915 respectively.

One of the notable cows entered in this test for the past year is "Grandview Rose," No. 37030, whose C.N.R.P. test gave 21,423 lb. milk and 890 lb. fat, but went ten days over the fifteen months' freshening period, therefore failing to qualify. She is the first Ayrshire cow in Canada to produce over 20,000 lb. of milk in one year, and is second high cow in the C.N.R.P. over all breeds in Canada. She gave birth following test to twin calves, a bull and a heifer. She was bred and is owned by Shannon Bros., Cloverdale.

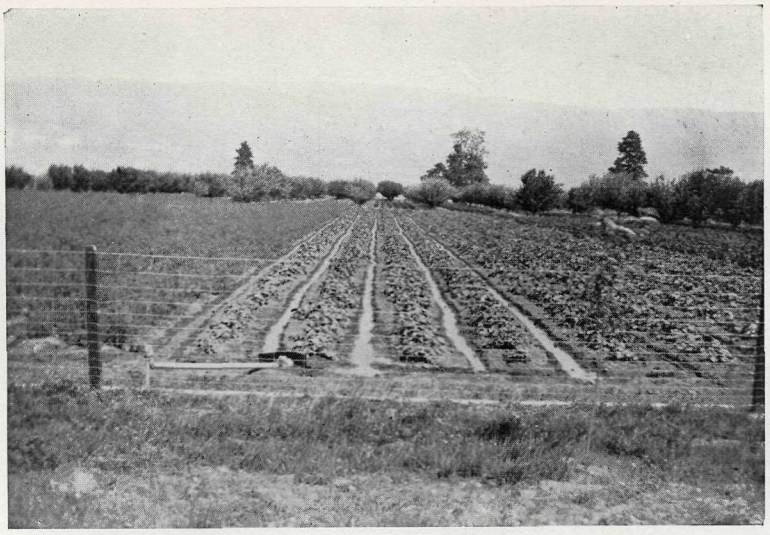
"DAIRIES REGULATION ACT."

Rules and regulations governing the "Dairies Regulation Act" (chapter 16, 1916) were passed by Order in Council in March, 1917, and became operative upon publication in the British Columbia Gazette during August last. This law makes it necessary that each and every creamery, dairy, or milk-handling plant of any kind accepting and dealing in or paying for milk or cream on the basis of the percentage of butter-fat contained therein to be licensed, and to have in its employ a properly qualified licensed milk-tester.

Up to the present time fifty-four applications for testers' licences have been received. Of these, thirty-six candidates have been examined and have obtained licences. The examination in each case consisted of a practical examination in testing by the Babcock method, followed

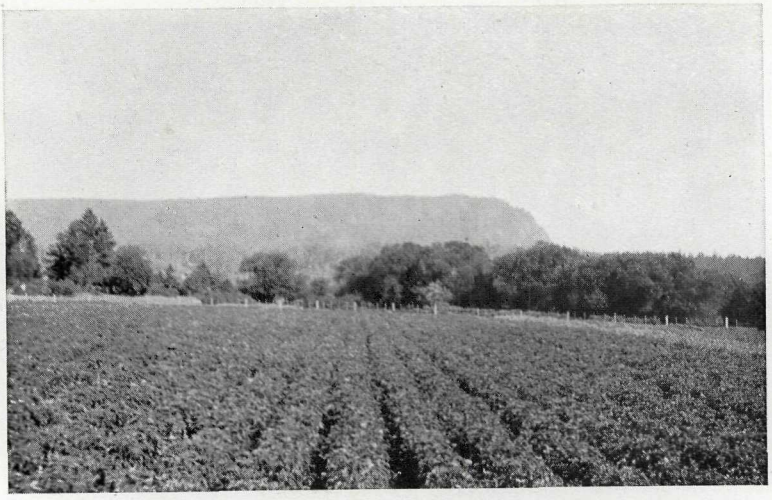


"Zarilda Clothilde 3rd DeKol," No. 14887, owned by Colony Farm, Essondale, B.C. Official record, 365 days: Milk, 30,469.2 lb.; butter-fat, 857.30 lb.; butter, 1,071.6 lb.



Part of Southern Okanagan Fruit and Vegetable Experimental Station, Summerland, B.C.

Pruning-school in Kootenays, 1917.



Netted Gem potatoes grown in bottom land; yield, 12 tons per acre.

by a written examination consisting of a series of questions on the composition, sampling, and testing of milk and cream. (Specimen examination paper is shown in Appendix No. 10.) One candidate failed in the first examination and will be given another chance within a few weeks. Further examinations will be held for the balance of the applicants as time permits.

Creamery and dairy licences will date from January 1st each year. Applications for 1918 are now being received, and licences will be issued in due course.

The following is a list of licensed testers up to date:—

Milk-testers licensed under "Dairies Regulation Act."

Name.	Address.
Batey, Herbert S.	Armstrong.
Boughtwood, Geo.	Valley Dairy, Ltd., Vancouver.
Bubar, D. T.	Courtenay.
Bunting, Thos.	Heffley Creek.
Burmeister, J.	Oxford Dairy, New Westminster.
Carman, J. E.	Revelstoke.
Campbell, A. M.	Fraser Valley Dairy, Vancouver.
Carter, J. N.	Turner's Dairy, Vancouver.
Carroll, W. J.	Courtenay.
Clark, F. J.	850 Fourteenth Ave. East, Vancouver.
Cranswick, P.	Royal Dairy, Vancouver.
Dudman, Alfred	Meadowbrook Creamery, Vancouver.
Dunn, J. S.	Nanaimo.
George, H. H. S.	Kamloops.
Gillman, R. H.	Northwestern Creamery, Victoria.
Hall, F. D. B.	Chilliwack.
James, David A.	Standard Milk Co., Vancouver.
Jenne, R. Everett	Grand Forks.
Johnson, Alfred	Salmon Arm.
Karnagel, R.	Salmon Arm.
Kell, Geo.	New Westminster.
Lewarne, A. E.	City Dairy, Vancouver.
Livingstone, J. M.	Vancouver Creamery, Vancouver.
MacKenzie, H. H.	New Westminster.
MacLeod, W. K.	Chilliwack.
Magar, J. A.	Kamloops.
Matheson, D. W.	Spencer's Creamery, Vancouver.
Rive, E.	1170 Hornby Street, Vancouver.
Sellers, Jas. H.	City Dairy, Vancouver.
Silver, M. R.	c/o P. Burns, Ltd., Vancouver.
Smith, Geo. W.	Nelson.
Smith, W. S.	Spencer's Creamery, Vancouver.
Thomas, S. J.	Kelowna.
Turner, L. H.	Turner's Dairy, Vancouver.
Washington, F. J.	Fraser Valley Dairy, Vancouver.
Watson, J. B.	Sardis.

OFFICIAL MILK-TESTERS.

The appointment of official testers in places where there is sufficient business to warrant it has been provided for under the rules governing the "Dairies Regulation Act." In May last Elias Rive and J. B. Watson were appointed such official testers at the request of the dairymen of the Lower Mainland. These men are under the direct supervision of this Department, and their duties consist of determining butter-fat tests of milk and cream, checking up weights and tests, etc., for both producers and purchasers. Very valuable service has been rendered by them, in that they have established a bond of confidence and closer co-operation between producer and purchaser.

DAIRY DEMONSTRATIONS AND LECTURES ON DAIRY SUBJECTS, 1917.

Covering a period from February 17th to March 20th, assistance was given to the usual Farmers' Institute meetings. Twenty-one institutes were addressed on subjects of general interest to dairymen, and in a number of instances practical demonstrations in butter-making were given. At the Summerland short course an address was given on the "Care of Milk and Cream," followed by a butter-making demonstration. At the latter meeting over ninety persons were present. A full report of the several meetings addressed has been submitted to the Secretary of the Department. At other times during the year special addresses in connection with Cow-testing Associations, British Columbia Dairymen's Association, Summer School for Teachers, Women's Institutes, and organization of new creameries were delivered.

FALL FAIRS.

During the season of fall fairs assistance was given in the judging of dairy products. The following fairs were included in the itinerary: Nanaimo, Parksville, Vancouver, Armstrong, Kamloops, and Saanich. A report on these has also been submitted to the Department.

BRITISH COLUMBIA DAIRYMEN'S ASSOCIATION.

The British Columbia Dairymen's Association has enjoyed one of its most successful years during 1917. The membership roll for 1917 stands at 277, representing an increase of fifty-seven over the previous year.

The annual convention of the association was held in Nanaimo on January 25th and 26th. The policy of the association of holding its conventions in the different dairying districts in turn has been fully justified, as the nearer these conventions can be brought to the dairymen, the better they will be attended, and the better the purposes for which the association exists will be promoted.

At the earnest request of the dairymen of the Okanagan Valley an extra convention of the association was held in Kelowna on June 22nd and 23rd. At that time demonstrations in live-stock judging and field-crop demonstrations were made special features of the meetings. These, together with addresses on dairy subjects by our most prominent agriculturists, rounded out by several picnic lunches and motor trips through the surrounding district, resulted in a most instructive and happy time to all who attended.

The eleventh annual report of the association was prepared and published. This includes a full statement of the affairs of the association, and is supplied free to all its members.

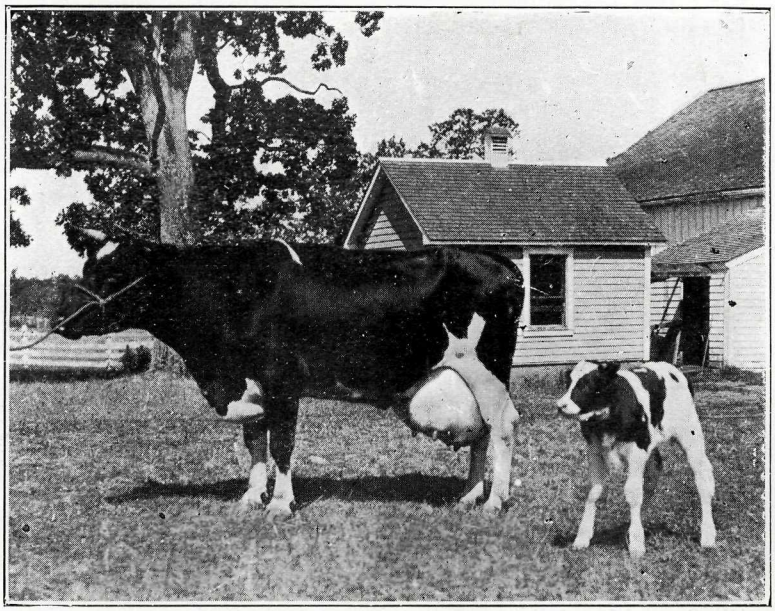
OFFICE-WORK.

This branch of the work has continued to increase. The letters received and replies sent out have never been so numerous, as evidenced by the following comparative statement:—

Letters received—	
1914	977
1915	814
1916	767
1917	923
Letters dispatched—	
1914	936
1915	1,152
1916	1,175
1917	1,303

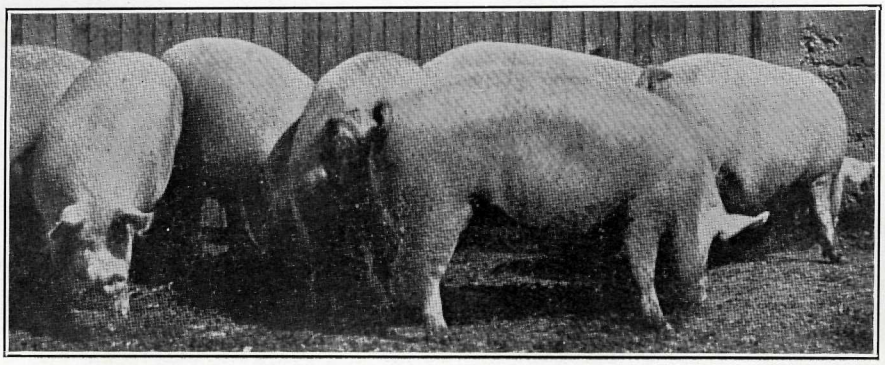
Respectfully submitted.

T. A. F. WIANCKO,
Dairy Instructor and Inspector.

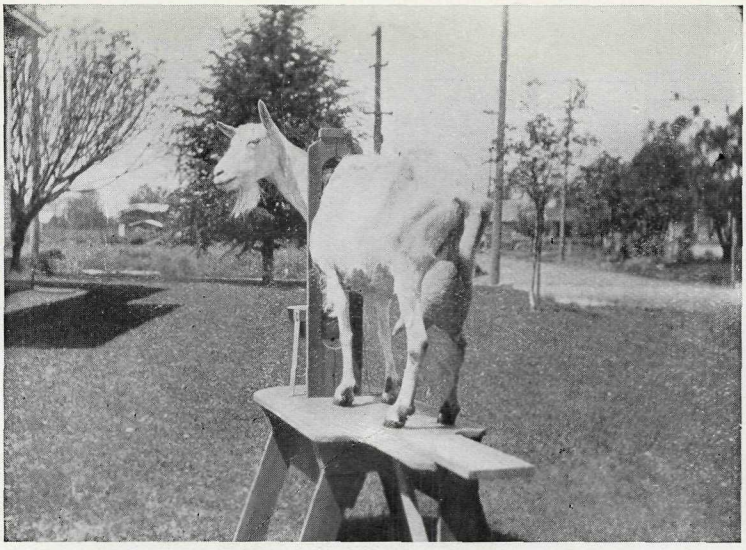


"Janet," No. 18057. Age, 4 years 85 days. Yearly record: Milk, 23,004 lb.; butter-fat, 717 lb. Owned by Dr. S. F. Tolmie, Victoria, B.C.

Up-to-date dairy-barn, Crescent Valley, B.C.

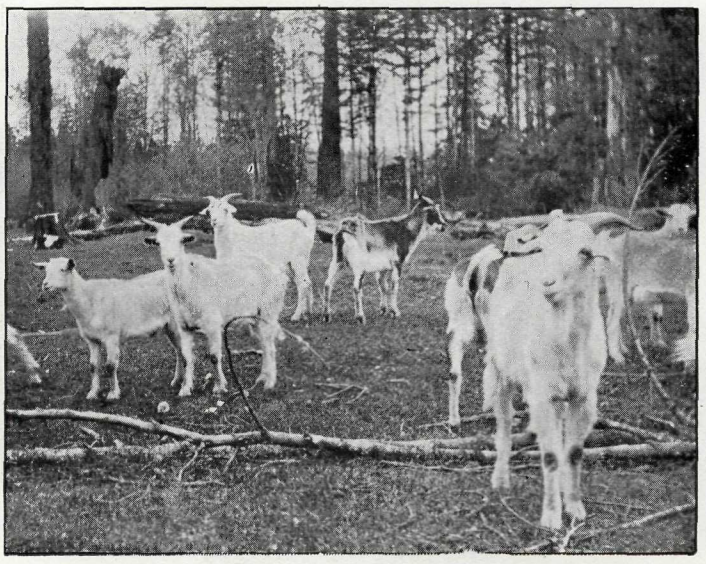


Young Yorkshire sows. They show quality and uniformity.



"Crystal May," 420, milked 4½ quarts to 5 quarts per day within sixty days of dropping her first kids.

Angora goats.



Good land-clearers.

ANNUAL REPORT OF POULTRY INSTRUCTOR.

J. R. TERRY.

W. T. McDonald, Esq.,
Live Stock Commissioner, Department of Agriculture, Victoria, B.C.

SIR,—I beg to submit herewith my annual report of the work of the Poultry Division for the year 1917.

GENERAL CONDITIONS.

During the year just concluded the industry has continued to experience the same unfavourable conditions that have been present practically since August, 1914. Feedstuffs have greatly increased in price as compared with the year previous. To partly offset this, the prices received for eggs, dressed fowls, and breeding stock have been higher, fortunately.

The climatic conditions could hardly have been worse during the spring months—the natural period of incubation. Bitter cold winds, snow, sleet, and rain were quite general in March and early April. From then on the season still continued cold and backward. There were numerous complaints of poor hatching results in consequence. In some cases the hatching season was delayed almost two months. As a result pullets were slow in developing, thus missing the good prices being paid for eggs in the fall and early winter.

Owing to the scarcity of fresh eggs in the spring the prices obtained were higher than usual, and continued a few cents above the 1916 average.

A peculiar condition was brought about in midsummer through the general public continuing to purchase eggs for packing, even when the price asked was almost 100 per cent. higher than usual. Fearing a big shortage during the winter, the public commenced packing early in April and continued right through May and June. It is computed that the quantity of eggs packed by householders was more than threefold that of previous years.

The number of chicks hatched was somewhat smaller than in 1916, but the increased prices received would bring the estimated total value well up to that of other years.

The well-established breeders have not reduced flocks to any extent, but in most cases have arranged so that their laying flocks contain a larger percentage of pullets than usual. Yearlings have been marketed since July last.

Where feed was purchased in large quantities in the spring of 1917 the poultry-keepers have been satisfied with the year's turnover.

The Prairie Provinces continue to purchase both eggs and breeding stock from our breeders as in previous years. It may be interesting to note that the Dominion farms in the Province now supply the poultry-breeding stock to practically all of the other experimental farms in the East. The egg records made, notably at the Experimental Farm, Sidney, on Vancouver Island, far exceeds all other records made elsewhere at similar farms in the Dominion.

Eggs and stock were again exported to the Antipodes, Japan, China, and to the United States. The number of day-old chicks, especially, going to the United States was in excess of all other years.

The city markets throughout the Province have again proved of value in providing means whereby local produce could be profitably marketed.

RABBIT-BREEDING.

This industry has again made rapid strides, due, no doubt, to the high prices received. The city markets have again done much to popularize rabbit-meat as an article of food. A large quantity of commercial rabbit-meat is now being canned, particularly in the Interior, where markets are not so easily secured as at the Coast. The prices received for some kinds of rabbit-furs are still high enough to make it worth while saving the skins. Pure black furs are most in demand. An association of breeders is now in course of formation.

LECTURES AND DEMONSTRATIONS.

During the year, particularly the spring and summer months, the members of this Division spoke and demonstrated before members of Farmers' Institutes during the regular itineraries given, and also at supplementary meetings.

The summer school for teachers was again resumed, and this Division lectured and demonstrated to those taking the rural-science course. In addition, trips were arranged to local farmers; proceedings much appreciated by the students. Mr. Upton, Assistant Instructor, again spoke to the first-year class, which was, as usual, larger than the second-year one.

Lectures and demonstrations were also delivered before members of local Poultry Associations throughout the Province, whilst in each locality the speaker endeavoured to visit as many poultry-breeders as possible.

FALL FAIRS.

The members of this Division, assisted, as in former years, by competent Provincial judges, placed the awards on poultry exhibits at the fall fairs and exhibitions. Whilst there was a slight falling-off in the number of exhibits, the majority of specimens shown were well up to former years in quality.

It is a pleasure to again report that accommodation for the poultry exhibits has improved. Undoubtedly this is due in a large measure to the fact that where poultry-breeders are elected to the show committees, more attention has been given to this matter.

The breeds most largely shown in other years again held popular fancy during the year. Plymouth Rocks, Wyandottes, Orpingtons, and Rhode Island Reds were the favourites in the general-purpose class, and Leghorns, Minorcas, and Anaconas in the egg-producing class. The Leghorns (White variety) are probably the most numerous breed in the Province, with the Wyandottes (White) a close second. The number of fairs giving classes for single entry is increasing.

Egg exhibits were more numerous than usual, and some very creditable displays were made. Several fairs still offer prizes for the largest eggs, regardless of freshness or otherwise of exhibits.

PROVINCIAL POULTRY ASSOCIATION.

In 1917 the association, despite continued enlistment of farmers keeping poultry, was again able to show a total membership as large as the previous year. A decrease in the number of affiliated associations has to be recorded, however. Four associations dropped out, and one new association (New Denver) was affiliated during the year, making a total of thirty local societies now in being. A majority of the associations engaged, as before, in the co-operative purchasing of feedstuffs, which very materially benefited its members.

The association again published its directory of breeders. The same number of copies were printed as usual, and distributed throughout the Province and also on the Prairies. The date of publication was a little earlier than heretofore, thus affording intending purchasers of eggs or stock plenty of time before the hatching period took place. The directory has proved of inestimable value, both to purchasers and vendors of poultry.

The district grouping of poultry-shows has proved a very satisfactory move, and has been the means of enabling those concerned in operating such shows successfully, especially from a financial standpoint. The districts now consist of ten groups, included in which is the Provincial Show.

The Provincial Show has now been located permanently at Vancouver, where it is confidently expected that it will again become the largest show held west of Guelph, Ontario.

The annual convention was recently held in Kamloops, and proved a great success. Nearly all the local associations were represented by their delegates. The show was held at the same time and place. It was pre-eminently a show of quality, and in numbers of exhibits was equal to the previous one. For the first time, this show has been operated without loss. A lady was elected Secretary for the first time, which showed the good judgment of the Executive by the successful manner in which the event was handled.

The association again donated prizes of $5 each to its members competing in the egg-laying contest whose pens laid at least 175 eggs per bird during the year. Diplomas were also awarded monthly.

Members of the association also did remarkably well in the Egg-laying Contest held at the Washington State College, Pullman. As a result an excellent export trade was worked up in stock and eggs during the year.

Your Instructor was again appointed Secretary-Treasurer and Mr. Upton Assistant Secretary, as per requirements of the constitution. (For list of the affiliated associations *see* Appendix No. 12.)

BRITISH COLUMBIA SHOW GROUPS.

(As revised, August, 1917.)

	Percentages.
District No. 1.—Vancouver Island, from Duncan north and including Duncan, Comox, Parksville, and Nanaimo	7
District No. 2—Vancouver Island, from Duncan south and including Victoria, Saltspring Island, Sooke, Langford, and Cobble Hill	10
District No. 3.—Vancouver City, includes the territory west of the eastern boundary of Burnaby; includes Vancouver City, North Vancouver, Central Park, and Point Grey	12
District No. 4.—From North Bend south and west to the eastern boundary of Burnaby, including Maple Ridge, Mission, and Chilliwack	9
District No. 5.—From North Bend north and east to Sicamous Junction, including Ashcroft, Kamloops, and Salmon Arm	25
District No. 6.—From Sicamous Junction south through the Okanagan Valley to Vernon, including Northern Okanagan	7
District No. 6A.—Kelowna, south to International Boundary, including Kelowna, Summerland, and Penticton	7
District No. 7.—From Sicamous Junction east to Alberta on the main line of the C.P.R. and south from Revelstoke to Slocan, including Revelstoke, Golden, Arrowhead, and Nakusp	7
District No. 8.—From Kootenay Lake west to Okanagan Valley, excepting that part included in District 7, including Nelson, Trail, Grand Forks, and Greenwood (Provincial Show)	9
District No. 9.—Crowsnest Valley, from Kootenay Lake east to Alberta, south of the main line of the C.P.R., including Fernie and Cranbrook	7
Total	100

EGG-LAYING CONTEST.

The Sixth Egg-laying Contest ended in October 5th, 1917, running the full year. The pens were filled as follows: Class 1, 21 pens; Class 2, 19 pens. With one exception, all the pens were Canadian-bred. One pen was entered from Oregon, U.S.A., and one pen came from Ontario. In the first class all prizes were won by White Leghorns, and in Class 2 the prizes were won as follows: First, second, fourth, White Wyandottes; third, Rhode Island Whites; fifth and sixth, Rhode Island Reds.

Additional special prizes, in the form of silver and bronze medals, were kindly donated by well-wishers.

The weather conditions were certainly not an improvement on the year previous. Throughout the spring and early summer the abnormally cold weather kept down egg production very materially.

The fowls that were not needed by contestants at the conclusion were sold by auction in Victoria. The final report of the contest, together with summary of same is shown in Appendices Nos. 11 and 11A.

"EGGS MARKS ACT," INSPECTION.

In addition to the members of this Division and the Coast Markets Commissioner in Vancouver who were originally appointed Inspectors to enforce the above Act, amendments were passed at the last session of the Legislature appointing all Provincial and municipal police officers and Health Officers to be Inspectors also. In addition, the poultryman in charge of the Egg-laying Contest was also appointed Inspector.

Infractions against the Act were very few during the first half of the year, but towards the period of egg shortage—October and November—so many complaints were made that charges were laid both in Vancouver and Victoria. In the majority of cases convictions were made.

It has been found necessary to suggest further amendments to the Act, owing to the fact that in several cases Inspectors were unable to secure convictions on account of the Act lacking comprehensiveness. As it was, a great improvement is to be noted in regard to the sale of eggs as compared with the period before the Act was in being.

During the year the Inspectors paid regular visits to all city markets on the Coast, besides making numerous calls on dealers, producers, and cold-storage plants.

BOYS' AND GIRLS' COMPETITIONS.

The past season was the second in which these competitions have been held, and great strides have been made. No less than twenty-four clubs were organized, as compared with eight the previous year. An earlier start was made in 1917, thus affording the children a better chance of success.

Considering the differences in climatic conditions, the results achieved by members of the clubs have been very creditable indeed. For instance, owing to the very late season in the Fort George District, the chicks were not hatched till weeks later than other districts, and yet the young stock showed signs of maturing well when visited in early fall. The largest club was that organized at Nelson, with forty-five competitors.

Complaints were numerous from almost every club regarding the depredations of birds of prey, coyotes, cats, mice, etc. The hawks and owls were especially bad during the fall months. It is to be hoped that the bounty about to be placed on owls will have an immediate effect.

Where possible, the flocks were visited twice by the judge and scored, while with the others the two scorings were made during the fall visit. An encouraging feature is the evident improvement in the general flocks kept by parents of contestants as compared with last year. The children have also sold a goodly number of breeding males from their flocks of both 1917 and 1916. In writing the essay required from each club member, a large majority of the children show that they fully realize the importance of attention to detail as essential to success. A list of clubs, etc., follows:—

Boys' and Girls' Clubs—Competition Entries in Poultry.

Name of Club.	No. of Competitors.	Name of Secretary.	Address of Secretary.
Arrow Lakes	22	Miss L. Parkinson	Nakusp.
Beresford	10	Miss Theresa Furiak	Kamloops.
Castledale	8	Miss Owen Gilbert	Castledale.
Courtenay	13	Harold Leighton	Courtenay.
Cowichan	12	E. H. Sherman	Box 483, Duncan.
Denman Island	9	Alex. Chalmers	Denman Island.
Fruitvale	12	Edward Garrard	Fruitvale.
Fort George	12	Charles F. Daly	Fort George.
Kelowna	9	T. M. C. Tayolr	Kelowna.
Martin's Prairie	9	Miss Martha Uvila	Pritchard.
North Kamloops	13	Chas. McC. Mottley	Box 202, Kamloops
Naramata	11	Miss Catherine Hancock	Naramata.
Nelson	46	Jack Fraser	Nelson.
Needles	8	Miss Erna Spiller	Fauquier.
Robson	10	Miss Margaret Brown	Robson.
Sooke and Milne's Landing	10	Miss Margaret Dewar	Sooke.
Scarf and Otter Point	11	Miss Margaret Woolsey	Scarf.
Salmon Arm	12	G. Reynolds	Salmon Arm.
Tappen	13	Miss Edna Brooke	Tappen.
Wapta	11	F. W. Ball	Parson P.O.
White Wyandotte, Castlegar	11	Miss Rose E. Watts	Castlegar.
West Summerland	12	Ronald Phinney	West Summerland
Mission City, Wyandottes	9	....	....
Mission City, Rocks	8	....	....

INSTRUCTIONS TO RETURNED WOUNDED SOLDIERS.

This Division has during the year visited returned soldiers who have engaged in poultry fancy either as a side-line or main occupation. The Convalescent Home at Esquimalt, where

both poultry and rabbits are kept, was also visited and helpful discussions taken part in. The poultry plant at the Sanatorium at Tranquille has been in charge of the sick soldiers there, to whom bulletins have been supplied. Special prizes were awarded their exhibits at the recent Provincial Show at Kamloops.

DINCONTINUANCE OF BREEDING-STATIONS.

No stations were operated during the year, although it is hoped that the Department may see fit to again locate breeding-pens in the least accessible parts of the Province, as formerly.

PUBLICATIONS.

The demand for bulletins has been as great as in former years, and as a consequence several reprints have been made. A bulletin dealing with the selection of breeding stock and a circular bulletin treating of chicken-pox were issued during the year.

Regular monthly reports of the Egg-laying Contest were issued, and articles on poultry subjects were supplied by members of this Division to the columns of the poultry periodicals, the *Agricultural Journal*, and Provincial press.

INSPECTION AND INSTRUCTION WORK.

Every opportunity has been taken by this Division to visit poultry-farmers and others interested. The parties visited have always showed a willingness to accept advice and help.

POULTRY-DISEASES.

The cold spring and early summer again made conditions extremely favourable for the development of colds and allied diseases. Epidemics of diphtheritic roup have continued to break out in various parts. The investigational work in connection with this disease has been continued. Favourable results have been obtained by means of vaccination.

Mr. Upton, who carried out this work, which has entailed much labour and care, reports as follows:—

". . . The cases of diphtheritic roup and chicken-pox, however, are being continually brought to our attention; many, however, in the embryonic stages, where a little care and attention has served to hold this trouble in check. We can say, however, that this disease has been checked to a great extent on Vancouver Island, where it was mostly prevalent in 1915, 1916, and 1917. During the past twelve months we have injected some 2,091 birds. Each bird was given the usual two inoculations with the vaccine which was prepared by ourselves. Very good results cannot be reported from the vaccine used, and the owners of the flocks injected were desirous of having the 1917 hatched stock injected also. This could only be done in cases where necessary, owing to the scarcity of material for making vaccine. At this time we can report excellent results from 591 birds out of 831 injected since September, 1917; not one instance of this disease having shown itself in any of the 591 birds. One lot of 240 birds, representative of some forty flocks, were injected, and the results were not as good, the vaccine used seeming to take a longer time to cause immunization in the stock than in the other 591 birds representing three other flocks. The same vaccine was used in all the birds, however. From these results it is again felt that we can produce even more evidence to prove the first statement, that the vaccine prepared by using the exudate and scabs together gives better and quicker results than when the vaccine is prepared from the pox-scabs alone.

"Some 10,000 c.c. of vaccine have now been prepared and 9,000 injections made, 3,831 birds inoculated being recorded. On one place alone were three deaths placed by the owner against the vaccine. This, however, could have been avoided by the owner removing the exudate from the mouth of the trachea. There was no other mortality due to the vaccination.

"Owners of some 9,000 head of old stock are desirous, if opportunity offers, of having their stock injected.

"The Lower Mainland cases are about the same, having been held in check by a germicide in the water and treatment of parts affected. The epidemic is now present in a slight form in many of the Interior birds."

Tuberculosis amongst fowls continues to be on the wane, thanks to the work of the Department in conducting tests among cattle again during the year. With the elimination of this

scourge from farm animals, it will be only a short time before the disease will be unknown amongst poultry.

OFFICE-WORK.

This branch of the work has developed as in former years. The number of callers has been up to average, and the number of letters received and forwarded has increased owing to the additional work incidental to the duties of members of the Division as Inspectors under "Eggs Marks Act," Boys' and Girls' Poultry Club judging, etc.

Respectfully submitted.

J. R. TERRY,
Chief Poultry Instructor.

ANNUAL REPORT OF SOIL AND CROP DIVISION.

H. O. ENGLISH AND E. W. HOGAN.

W. T. McDonald, Esq.,
Live Stock Commissioner, Department of Agriculture, Victoria, B.C.

SIR,—We have the honour to submit herewith the annual report of the Soil and Crop Division for the year ending December 31st, 1917.

DEMONSTRATION STATIONS.

Eight demonstration stations were operated under the supervision of officials of the Soil and Crop Division during 1917. These were located at Armstrong, Chilliwack, Edgewood, Grand Forks, Rock Creek, Rose Hill, Errington, and Pitt Meadows.

With the exception of those located at Errington and Pitt Meadows, the Soil and Crop officials were assisted in the direction of the work by committees appointed by the local Farmers' Institutes. A local manager was employed on each station.

For various reasons it has been decided to discontinue work on all the above stations except that located at Pitt Meadows. In view of this fact we will include in this report a summary of the work attempted and the results obtained on each plot during the four years since the inception of the work.

Armstrong.—The field chosen for this station was situated about the centre of the large bench south-east of Armstrong, in the Northern Okanagan Valley. The soil on this bench was a heavy lifeless clay, almost devoid of humus and with poor natural drainage. The fertility of the soil was depleted by the continuous growing of grain-crops. An attempt was to be made to improve the fertility of the soil on the plot and to increase its productivity by methods within the means of the average farmer of the district.

The station, which consisted of 4 acres, was divided into five plots of equal size. In 1914 three plots were seeded to a mixture of oats, barley, and peas; one heavily manured and planted to corn, and the other summer-fallowed. The yield of 1,350 lb. of grain-hay or 2 tons of corn fodder per acre is a good indication of the condition of the soil. Two plots were seeded to alfalfa in rows in 1915, one summer-fallowed; the plot summer-fallowed the previous year was manured and planted to corn, while the 1914 corn-plot was seeded to oats. The two plots seeded to alfalfa were allowed to remain down to this crop for three years, while a rotation involving corn, oats, and summer fallow was followed on the other three plots.

Although the alfalfa had been planted in rows and the potato-cultivator used to cultivate the spaces between the rows, this crop made very little headway during the three years. In 1917 the alfalfa blossomed freely and gave promise of the production of a fair seed-crop. The crop when harvested yielded only about 20 lb. of seed per acre. Grasshoppers were very plentiful and were partially responsible for the low yield. Each year the plot to be summer-fallowed received 15 tons of barnyard manure. Deep ploughing was practised and the land frequently disked and harrowed. In 1916 sweet clover was seeded with the oats, the aim being to use this crop as a subsoiling agent and to plough it down in 1917 as a green manure. In spite of the good treatment the land received, the corn-crop never returned interest on the investment, while in only one year—1915—did the oat-crop pay for the cultivation of the land.

The station was so located that an experiment in underdrainage was out of the question. It would appear that underdrainage, deep cultivation, and a liberal application of lime would render conditions more favourable to crop production, but the expense involved prevents individual farmers from conducting the experiment.

Chilliwack.—The land chosen in 1914 for this station in the Lower Fraser Valley was located on the property of Mr. Gardiner, adjoining the east road between Chilliwack and Sardis. The soil was a clay loam, lacking humus. The land was very weedy.

In 1914 the station, which consisted of 4 acres, was divided into four plots of equal size. While it was decided to ultimately adopt a crop-rotation including corn and roots, oats, clover mixture for hay, and clover mixture for pasture, in 1914 one plot was seeded to oats and vetches, one to corn and sugar-beets, one to oats, and one to vetches. Eventually the plan of pasturing one plot each year was altered to that of harvesting one crop of hay from the second-year clover-plot and the cultivation of the plot for the balance of the season to eradicate the Canadian thistle and couch-grass. Each year the plot selected for the corn and roots received a dressing of about 15 tons of barnyard manure per acre.

Minnesota No. 13 corn was grown on ¾ acre each year, and during 1915-16-17 seed-corn of this variety was saved. Between 900 and 1,000 lb. of first-class seed was harvested each year. By selecting for early maturity an earlier ripening strain has been developed. On the remaining fourth of this plot mangels were grown. During 1915-16-17 the Sludgstrop variety was used. The preparation of the plot for mangels was practically the same each year, and under the cultural methods employed a marked increase in yield has been recorded each year except 1916, when climatic conditions were unfavourable. The yields by years per acre were:—

	Tons per Acre.
1914	21⅘
1915	37⅘
1916	33
1917	42

Oats followed corn in the rotation. Banner oats were grown each year until 1917, when the acre plot was divided into four equal plots and four varieties—viz., O.A.C. No. 72, Garton No. 22, Seger, and Banner. These were grown under identical conditions as a variety test.

The oats were seeded at the rate of 50 lb. per acre. With the oats, as with the mangels, an annual increase in yield has been recorded, as follows:—

	Lb. per Acre.
1914	Cut for hay.
1915	1,630
1916	2,285
1917	2,911

The oat-plot was seeded down each year to a mixture of red clover and alfalfa, 12 lb. of the former and 6 lb. of the latter. Two crops of clover-hay were harvested the first year after seeding, which yielded from 4½ to 5 tons per acre each year. The second year after seeding down to hay mixture only one crop of hay was removed, the second crop being turned under to improve the condition of the soil and the plot cultivated in such manner as to weaken the weeds which infested the land.

Couch-grass was the worst weed with which we had to contend. The practice was to plough the land about 5 or 6 inches deep about the first week in August, and then cultivate frequently with the spring-tooth and drag harrows to drag the roots of the couch-grass to the surface and expose it to the sun. When dry the roots were burned.

The success of this method of eradicating this weed may be judged from the following: In 1916 the cultivation of the corn and mangel plot to control the weeds where special cultivation had not been practised in 1915 cost the Department $51.20, while the cost during 1917 was only $40.50. The weeds were easily controlled in 1917 with less cultivation, although this plot had been the most weedy part of the station in former years.

It should be mentioned that the alfalfa-seed was mixed with the clover-seed to inoculate the soil with a view to future alfalfa-culture. The alfalfa in every case survived and produced even more sturdy growth during the second year after seeding.

The Division has been successful at this station in improving the soil condition, greatly increasing crop yields, and at the same time bringing the weeds under control by methods within the means of the average farmer of the district.

Edgewood.—This station was located in 1914 on the property of Mr. Wm. Calder, about four miles from Edgewood, on the Arrow Lakes. The soil was a very heavy clay. The 4 acres comprising the station was divided into three plots of equal area, and a rotation involving an intertillage crop, a grain-crop, and clover was adopted.

This station was operated during four seasons. Deep cultivation was practised and from 10 to 15 tons of manure applied to the intertillage plot each year.

The mangels were a total failure and this crop was dropped from the rotation in 1916. The corn-crop was given a three-year trial and discontinued in 1917. The soil was too wet in the winter, sour in the spring, and baked too hard during the early summer to permit the successful culture of either of the above crops. Underdrainage and a heavy application of lime were recommended, but labour was too scarce and the revenue too small to warrant the expenditure.

Oats and clover yielded fairly well each year, the oats averaging about 1 ton and the alsike clover about 4 tons per acre.

Grand Forks.—The centre of the Agricultural Association grounds at Grand Forks (Kettle Valley District) was selected as the most suitable location for a demonstration station for the district. The plot consisted of 4 acres of silty soil.

The crop-rotation adopted in 1914 included summer fallow, intertillage, grain, and alfalfa. Existing conditions at this station have proven the location to be unsuitable for demonstration-work. There were no facilities for irrigation. The annual rainfall was not sufficient to produce a crop, and the growing crops were forced to depend upon subirrigation subsequent to the rise of the river in midsummer for their moisture. The river did not rise to the same height each year, and the consequent variation in amount of moisture supplied to the crops caused considerable variation in yield. In addition to this, the fence around the association grounds was not cattle-proof and the crops were frequently damaged by the live stock of the district.

The crops at this station yielded very fair returns in 1915 when sufficient moisture was available. Only partial crops were harvested in 1914-16-17.

One interesting feature of the work at this station was the way in which the alfalfa survived the midsummer drought each year to produce one fair crop of hay the following spring. In 1916 this crop appeared to suffer severely from drought and it was feared it would not survive. However, it not only survived, but produced a first cutting of hay on June 29th, 1917, which yielded at the rate of 5,500 lb. per acre.

Rock Creek.—A part of A. D. McLennan's farm on the Rock Creek-Bridesville Road was selected as the most suitable location for demonstration-work in the Rock Creek District. Work was begun at this station in 1914. One acre was devoted to the culture of alfalfa seeded broadcast, while the balance of the station (4 acres) was divided into five plots, and a crop-rotation, including alfalfa, intertillage, oats, and summer fallow, adopted.

The soil was a clay loam. Barnyard manure was not available; hence a cropping system was adopted which provided for the ploughing-down of a crop of peas each year on the plot to be summer-fallowed.

Results at this station have varied. Corn and mangel growing was attempted, but unsatisfactory yields were obtained, due in part to the poor condition of the soil and also to the high altitude and cool nights. The alfalfa caught readily when good seed was available and only winter-killed slightly. In districts such as this only the best of the hardiest strains of alfalfa should be used.

The oat-crop gave a maximum yield in 1916 of about 90 bushels per acre. All crops suffered from drought and gophers in 1917 and were harvested for hay during July.

Rose Hill.—Demonstration-work was commenced in 1914 on C. R. Green's farm, near the Beresford School, south of Kamloops, which was to serve that large mixed-farming district. A corner of Mr. Green's farm near the road which contained about 8 acres was selected. The soil near the road was a clay loam. The land sloped into an alkali pond, about 1 acre along the pond being affected by alkali.

The rotation adopted included alfalfa, summer fallow, intertillage, and grain. While the alfalfa lived, it did not produce a satisfactory crop of hay in three years. The intertillage crops—corn and roots—were given a three-year trial, but failed to produce profitable yields in any year, the maximum being about 10 tons of mangels and 3 tons of immature fodder-corn per acre. It was then planned to try mixtures of oats, wheat, vetches, and peas in order to

determine which combination gave the heaviest tonnage for silage purposes. Oats and peas gave a maximum yield of 6 tons per acre.

Banner oats were grown for seed following the intertillage crop. The yields per acre by years were:—

	Oats. Lb.	Wheat. Lb.
1914	1,231	...
1915	2,272	1,646
1916	1,726	1,886
1917	1,776	2,232

Considering climatic conditions in this district during 1916 and 1917, the yields obtained would tend to indicate that either the cultural methods or the seed-selection practised had produced definite positive results.

In the winter of 1916-17 the fall-sown wheat, oats, and vetches winter-killed so badly that peas and flax were seeded as a catch crop. Three varieties of peas—Arthur, Solo, and Prussian Blue—were sown, the Arthur giving by far the greatest yield. The flax yielded approximately 12 bushels per acre. The above plot was not seeded until May 26th and the rainfall was negligible.

Errington.—This station was located in 1914 on the property of the Vancouver Island Fruitlands, Limited, near the Errington Post-office. Prior to 1917 about 13 acres were cultivated. In 1917 an additional 7 acres were seeded. The soil was variable, there being about 15 acres of black muck and 5 of gravelly loam.

The rotation adopted included corn, grain, and hay crops. Barnyard manure, except in limited quantities, was not available, only four dairy cows, three horses, and a few pigs being fed at the station. The manure was applied each year to the land to be devoted to corn. No commercial fertilizer was purchased after the first year, yet by practising crop-rotation, through cultivation, and utilizing all available manure the crop yields have been gradually increased, until in 1917 maximum results were obtained. Fodder corn yielded approximately 7 tons, clover-hay about 2 tons, and barley ½ ton per acre.

Pitt Meadows.—The site for this station (near New Westminster) was chosen in 1915. A part of F. V. Harris's farm was considered most suitable. The surface soil is a mixture of peat and undecayed vegetation and the subsoil a silty clay.

Work was not commenced on this station until the autumn of 1916, when the land was ploughed deeply and a system of tile drains installed. These worked satisfactorily during the winter of 1916-17.

Demonstration-work was commenced in 1917. The station was divided and subdivided in order to demonstrate the effect of various methods of soil-treatment on the common mixed-farming crops.

On a part of the station, oats, barley, and turnips were grown on plots which had previously received applications of various fertilizers. The balance was divided into five large plots. Barnyard manure was applied to the first plot at the rate of 20 tons per acre and lime at the rate of 1½ tons per acre. The second plot received an application of lime only. The third plot was not treated and served as a check. Plot No. 4 received an application of barnyard manure, while commercial fertilizers (sodium nitrate and superphosphate of lime) were applied to Plot No. 5. Sodium nitrate was applied at the rate of 100 lb. and superphosphate 300 lb. per acre. These plots were subdivided and the effect of the various applications on the common mixed-farming crops tested. The crops grown were oats, barley, peas, flax, vetches, millet, fodder corn, mangels, turnips, carrots, and potatoes.

Heavy rains in June caused a rapid rise of water in the main ditches and tile drains. The land became too soft to bear the farm-horses and cultivation was delayed. This allowed the weeds to gain temporary control, and necessitated the harvesting of some of the crops for hay to prevent the ripening and scattering of the weed-seeds.

The plots receiving a treatment of barnyard manure and lime produced the heaviest yields of marketable produce. On the small series the presence of manure was readily noticeable whenever used, while on the larger series the lime-and-manure treatment was followed in almost every instance by manure alone, and this by lime. The crops grown on the plots receiving commercial-fertilizer treatment were very little better than those on the check-plots.

Banner and Leader oats were tested under similar conditions. It was estimated that either variety would yield over 100 bushels per acre on the plot treated with lime and manure. On the series the Banner averaged approximately 80 bushels per acre, while the Leader yielded 85 bushels per acre. Both varieties lodged badly.

The barley was damaged more than the other crops by the high water in June. Except on the manure and lime and manure plots, it was entirely drowned out. Vetches, peas, and flax grew very satisfactorily, but only matured properly on plots receiving manure. The Longfellow fodder corn gave the heaviest yield, followed by the North-west Dent and Minnesota No. 13 in the order named.

The following table gives the yield per acre of the various root-crops:—

Fertilizer Tests with Root-crops.

Plot.	Treatment.	Mangels.		Turnips.		Carrots.
		Sludgstrop.	Long Red.	Jumbo.	Magnum Bonum.	
		Tons.	Tons.	Tons.	Tons.	Tons.
1	Lime and manure	8.940	14.257	17.641	14.592	13.939
2	Lime	1.089	3.484	12.414	6.752	8.276
3	Check	0.653	0.653	2.832	2.613	8.712
4	Manure (alone)	5.880	4.138	11.543	17.859	12.632
5	Commercial fertilizer	...	...	5.227	3.920	6.534

NOTE.—Mangels were a complete failure on Plot No. 5.

It will be noted that with all varieties except the Jumbo the manured plots yielded more than the limed plot. The mangels were most affected by the absence of barnyard manure and the carrots least affected, while turnips were intermediate. (For table showing yield per acre of potatoes *see* Appendix No. 13.)

DEMONSTRATION CLOVER AND ALFALFA HULLING.

The 1917 season was not favourable to the growing of alfalfa and clover seed. The rainfall was light and injurious insects plentiful. Labour was not available, and many who planned in the spring to save a part of their hay-crop with a view to seed production, later abandoned the idea and cut the crop for hay.

The Department clover and alfalfa huller was operated in three districts only—Edgewood, Kelowna, and Armstrong. Ten farmers availed themselves of the Department's offer and had their seed-crops threshed, paying at the rate of $1 per bushel of seed threshed. During the season there were threshed by the machine 1,190 lb. of clover-seed and 1,685 lb. of alfalfa-seed. All of the seed threshed will be disposed of locally.

DEMONSTRATION UNDERDRAINAGE.

The need for underdrainage in certain parts of the irrigated districts of the Province has become more evident each year, yet, owing to the high cost of drain-tile and the scarcity of labour, very few drainage systems have been installed. The most serious need was found in the Summerland and Kelowna Districts, where irrigation-water carries the soluble salts down from the benches and, evaporating, deposits large quantities in the lower lands. The need for some efficient system of drainage to remove this surplus water is becoming more urgent each year.

In an endeavour to assist the farmers of the above districts the Department purchased a "Cyclone" ditcher and offered to loan it, together with the services of a drainage expert, to the farmers free of charge. Seven farmers availed themselves of this offer during 1917. The official in charge of this work visited the various farms, surveyed the fields needing drainage, and advised the various owners regarding the best way to cope with the situation. Although the ditching-machine was purchased early in February, it was not delivered until late in September. As a result, very little actual underdrainage-work was done. The machine was operated on one

farm in the Summerland District, where a field of 2 acres was ditched. The machine worked satisfactorily to a depth of 28 inches. While no data are available as to the actual cost of removal of earth by this method as compared with other methods, those in charge of the work consider that for the excavating of long ditches, where frequent turning is unnecessary, this machine should materially assist in reducing the labour problem incident to work of this nature.

DEMONSTRATION SEED-CLEANING.

Farmers' Institutes were notified early in the year by circular letter that the Department had purchased a "Clipper" seed-cleaner and was prepared to conduct demonstrations in seed-cleaning. Thirteen Farmers' Institutes applied for demonstrations, but owing to conflicting dates only eleven were conducted. Seed was cleaned in the following districts: Bridesville, Chilliwack, Duncan, Kaleden, Kelowna, Lumby, Nanaimo, Pitt Meadows, Pritchard, Vernon, Victoria, and Westbank. Sixty-five farmers were benefited in actually having seed cleaned, while a large number of others were present at the demonstrations and benefited indirectly. Between 50 and 60 tons of seed was cleaned. Seventeen kinds of seed were put through the machine, including wheat, oats, barley, speltz, peas, beans, alfalfa, clover, mangel, cabbage, onion, parsnip, radish, tomato, sweet peas, and flower-seeds.

While the "Clipper" cleaner will remove all very small, oversized, and light seed as well as refuse, it does not separate the foreign seeds of similar shape or weight. A few of those attending the demonstrations claimed that they had fanning-mills at home that were more efficient than the "Clipper," but as they had failed to take advantage of the Department's invitation to bring such machines to the demonstration, their claims were not substantiated. The "Clipper" used by the Department was a No. 2 B. The machine could be more conveniently operated were some means provided to prevent seeds lodging in the lower screen; otherwise the work was quite satisfactory.

FIELD-CROP COMPETITIONS.

A bulletin announcing the results of the 1916 crop competitions and seed fairs was published in February. In this bulletin the rules and regulations governing the 1917 field-crop and seed competitions were announced. A few important changes were made in the rules, including:—

(*a.*) The increasing of the number of entries necessary from six to eight.

(*b.*) A reduction in the total amount of prize-money paid per competition from $45 to $30, and the division of this among the five successful competitors as follows: $10, $8, $6, $4, $2.

(*c.*) The offering of a special institute prize to the institute conducting the most successful competition. (The special institute prize consisted of ten of the best agricultural periodicals published in Canada and the United States; these to comprise the nucleus of a circulating library in the district qualifying for same.)

(*d.*) A special machinery prize to any competitor winning a first prize in a keenly contested competition.

Eighty competitions were conducted with a total entry-list of 718 plots. Competitions with potatoes, oats, wheat, and grain-hay were again popular, as the following list indicates:—

Kind of Crop.	No. of Competitions.
Potatoes	40
Oats	11
Grain-hay	9
Wheat	8
Mangels	3
Carrots	3
Corn	2
Clover, alfalfa, turnips, and kale	1 each

The Metchosin Farmers' Institute was awarded the special prize provided for the institute conducting the most successful competitions. This institute conducted competitions with potatoes and grain-hay, having an entry-list of twenty in the former and fourteen in the latter. The majority of the competitors in each competition appeared to be deeply interested in the scoring of the plots, and the judges report having spent two interesting days in that district.

Special prizes were awarded to the winners of eleven competitions, in which the interest evinced was exceptional and the scoring close. The districts in which special prizes were awarded, the winners of the prizes, and the prizes chosen in each case are given below:—

District.	Winner.	Address.	Prize selected.
Bella Coola	O. J. Nygaard	R.R. 1, Bella Coola	Planet Junior.
Cowichan	P. W. Anketell-Jones	Chemainus	Potato-cultivator.
Eagle River Valley	A. Anderson	Malakwa	Potato-cultivator.
Kelowna	A. W. Cooke	Kelowna	Seed-cleaner.
Nicola	R. W. Dodding	Lower Nicola	Seed-cleaner.
Metchosin	Geo. Ball	Rocky Point	Portable spraying outfit.
Metchosin	Percy D. Hillis	Rocky Point	Potato-cultivator.
Revelstoke	J. J. Malcolm	Revelstoke	Potato-cultivator.
Rock Creek	William Johnson	R.R. 1, Rock Creek	Potato-cultivator.
Rose Hill	C. R. Green	Kamloops	Seed-cleaner.
Victoria	Chas. E. King	Cedar Hill	Planet Junior.

In districts were the seed-cleaner was the prize chosen, the present holder must win the prize a second time before it becomes his property.

SEED FAIRS.

The Field-crop and Seed Competitions Bulletin published in February contained the announcement of the rules governing the local and Provincial seed fairs. The prize-list was published at the same time. Provision was made in this bulletin for the holding of two Provincial and eight local seed fairs. After the bulletin went to press the Island farmers were granted a seed fair.

The labour shortage was so acute that districts formerly holding local seed fairs were forced to abandon the practice in 1917. As a result, only the three Provincial seed fairs were conducted.

The Islands Seed Fair held at Duncan, November 29th and 30th, brought out the largest entry-list and the greatest variety of exhibits. As the first Islands Seed Fair the showing was creditable. The Southern Interior Seed Fair was held at Armstrong, December 6th and 7th. The classes were well filled and competition keen, although prevailing conditions in this district in 1917 were not favourable to seed production. The showing at the Central Seed Fair, conducted under the auspices of the Department at New Westminster, December 13th and 14th, was not satisfactory. Some exhibits of outstanding quality were placed, but competition was lacking. In view of the possibilities for seed production in the central district, this lack of interest is inexcusable.

The feature of the seeds fairs in 1917 was the quality of the exhibits of root, vegetable, and flower seed.

A seed-growers' directory was compiled from the lists of those competing at the 1916 seed fairs, and published early in January. This directory contained the names of the seed-growers competing in the various classes, the variety exhibited by each, the quantity of seed for sale, and the price asked. This directory was mailed to all Secretaries of Farmers' Institutes and to others on request. This publication assisted materially in bringing those needing seed into touch with the seed-grower. A similar one is being prepared containing a list of the exhibitors at the 1917 seed fairs.

Seed-growers' meetings were held in conjunction with the seed fairs. Professor L. Stevenson, Superintendent of the Dominion Experimental Station at Sidney, B.C., addressed meetings at all three fairs, while Professor P. A. Boving, of Vancouver, assisted at Duncan. E. W. Hogan, of the Department, assisted at Armstrong, and P. W. Anketell-Jones, of Chemainus, addressed a meeting at New Westminster.

CO-OPERATIVE VARIETY TESTING.

The scarcity of reliable information as to the varieties of the mixed-farming crops best suited to soil and climatic conditions in the various agricultural districts of the Province has resulted in each farmer growing those varieties which he considered best. As a net result of this lack of data, one would experience considerable difficulty in placing in any one district of

the Province an order for a car-load of seed-grain or potatoes of any one variety. As an initial step toward the settlement of this uncertainty the Department decided in 1916 to distribute samples of first-class seed of the more important field crops to farmers in the various districts. The public was notified of this contemplated action early in January through the Farmers' Institutes. The Department offered to supply 10-lb. samples of each of three varieties of wheat, oats, and barley; 15-lb. samples of each of three varieties of potatoes; and 1-lb. samples of each of three varieties of fodder corn. At the same time 5-lb. samples of seed and fibre flax and 1-lb. samples of sugar-beets were offered for distribution.

The public appeared to realize the need for reliable data as to adaptability of varieties to local conditions, and this office was flooded with applications for seed. Unfortunately, the Department's supply of seed was limited and many applicants were disappointed. Below is a list of the varieties and the number of samples of each distributed:—

Crop.	Variety.	No. of Samples.	Total Quantity of Seed distributed.
			Lb.
Wheat	Marquis	93	930
"	Red Fyfe	93	930
"	Bluestem	93	930
Oats	Banner	60	600
"	Seger	53	530
"	Garton No. 22	64	640
"	Leader	57	570
"	O.A.C. No. 72	40	400
Barley	O.A.C. No. 21	47	470
"	Beardless	47	470
"	White Hull-less	47	470
Corn	N.W. Dent	95	95
"	Minnesota No. 13	95	95
"	Longfellow	95	95
Potatoes	Burbank	100	1,500
"	Carmen No. 1	99	1,485
"	Gold Coin	94	1,410
"	Netted Gem	101	1,515
"	Eureka	99	1,495
Flax	Seed	47	235
"	Fibre	47	235
Sugar-beets	Viimorin	191	191
Totals		1,757	15,291

About 10 per cent. of those receiving seed report crop-failures, due either to unfavourable climatic conditions or to the ravages of live stock.

Reports already received would seem to indicate that results differ with climatic conditions in the various parts of the Province. A summary of the results compiled from reports received is given in the following tables. The numbers in the columns represent the suitability of the varieties to the various districts as determined from the reports received.

Summary of Results with Wheat Varieties.

	Bluestem.	Marquis.	Red Fyfe.
Islands	1	2	3
Lower Mainland	2	3	1
Central Interior (Nicola to Revelstoke and Okanagan)	1	2	3
Boundary and Kootenays	1	2	3
Northern Interior	1	3	2

Summary of Results with Oat Varieties.

	Banner.	Seger or Victory.	Garton No. 22.	Leader.	O.A.C. No. 72.
Islands	4	5	2	1	3
Lower Mainland	3	2	4	1	5
Central Interior	2	3	4	5	1
Boundary and Kootenays	1	5	4	2	3
Northern Interior	2	1	3	..	..

Summary of Results with Barley Varieties.

	O.A.C. No. 21.	Beardless.	White Hull-less.
Islands	1	2	3
Lower Mainland	1	3	2
Central	1	2	3
Boundary and Kootenays	1	2	3
Northern Interior	1	2	3

Summary of Results with Potatoes.

	Burbank.	Carmen No. 1.	Gold Coin.	Netted Gem.	Eureka.
Islands	2	4	1	5	3
Lower Mainland	2	3	4	5	1
Central Interior	1	2	4	3	5
Boundary and Kootenays	3	3	5	4	1
Northern Interior	4	3	2	5	1

Owing to the variation in climatic conditions within the various districts, the results compiled from one year's test should not be considered as final, but rather as a preliminary report. It will be necessary to continue this line of investigation for at least five years, using the best seed available each year, before the results may be considered reliable. While the above tables give the actual rating of the different varieties in the various districts as regards yield, other factors, such as the disease-resistance of the variety, its quality, suitability to market, etc., must be considered in determining which variety should be grown.

The Bluestem, while the heaviest-yielding variety of wheat is soft, and as such had not as high a milling value as either of the other varieties. The Marquis had the strongest straw.

Of the oats, the Banner and the O.A.C. No. 72 have a long thin kernel, the Seger a kernel of medium size, and the Leader and Garton No. 22 very plump kernels. The Garton No. 22 has perhaps the strongest straw and is the earliest of the five varieties. The O.A.C. No. 72 displayed exceptional strength and length of straw in view of its fineness. The Leader, a coarse-strawed variety, produced the heaviest yields in the Coast districts, but did not stand up well. The Seger or Victory is a very pretty oat, straw medium fine, kernel medium size, and yield fair in all districts.

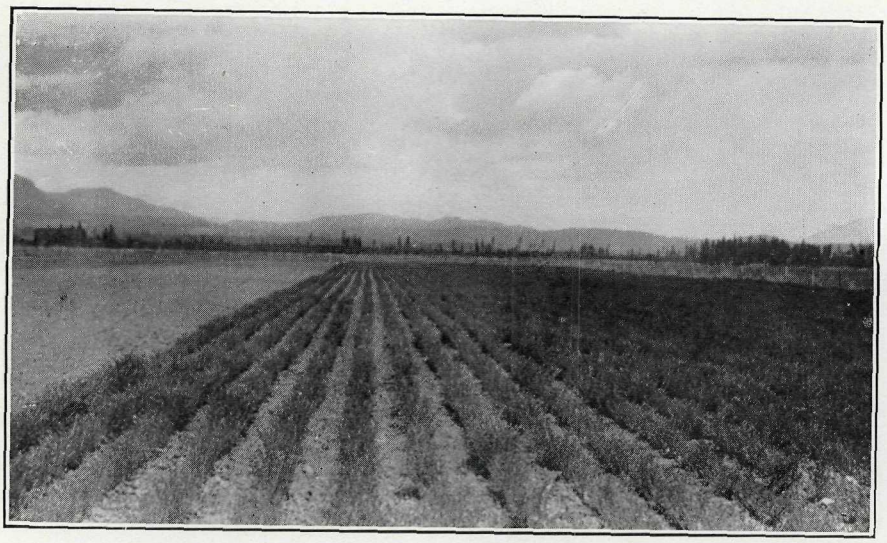
The O.A.C. No. 21 barley outyielded the other variety in almost every test, in many instances producing almost as much as the other two varieties combined.

Seasonal variation and the source of the seed used has such an important relation to the crop yield with potatoes that conclusions drawn from a one-year test are apt to be misleading. The rating in the above tables should be taken as a preliminary report only.

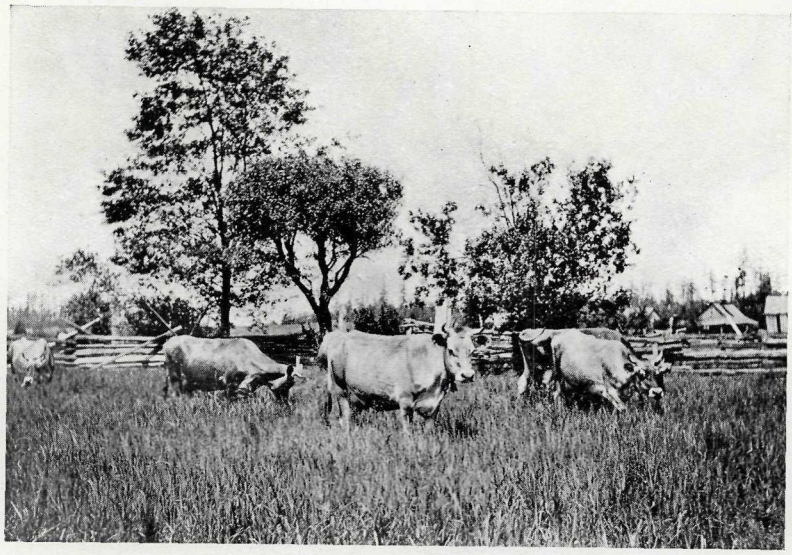
COST OF PRODUCTION SURVEY.

As in 1916, those entering in the field-crop competitions were induced to keep records of the cost of producing the crops entered. Some interesting data compiled from such reports are submitted in Appendix No. 14.

Potatoes on a Francois Lake ranch.



Alfalfa planted in rows with a view to seed production. Two pounds of seed used per acre.



Pure-bred Jerseys at Keating.

The costs are based on the actual cost of farm crops in storage on the farms on December 31st. From data submitted by eighteen farmers the actual cost of delivering potatoes at the market shipping-point entailed a further expenditure of $4 per ton. Adding this to the cost of producing a ton of potatoes as submitted in the table in Appendix No. 14, the cost f.o.b. shipping-point would be $16.90.

In view of the recent controversy as to the actual cost of production of farm crops, it is interesting to compare the 1917 reports with those submitted in 1916.

	Yield, 1916.	Yield, 1917.	Decrease.	Cost, 1916.	Cost, 1917.	Increase.
	Tons.	Tons.	Per Cent.			Per Cent.
Potatoes (field crop)	9.85	8.12	17.6	$ 9.77	$12.90	32.3
Potatoes (boys and girls)	9.94	7.00	29.5	9.64	15.88	64.7
Wheat	1.46	85	41.2	19.12	32.00	67.3
Oats	1.15	90	21.7	20.70	33.07	60.0
Grain-hay	2.00	3.40	...	7.64	9.57	25.2
Carrots	20.00	25.00	...	3.31	3.78	14.2

Lack of rain during June, July, and August was responsible for the lighter yields of potatoes and grain-crops. The root-crops benefited by the early fall rains. It is interesting to note that, while there was a decrease in yield per acre of from 15 to 40 per cent. and an actual increase in cost of production in 1917 over 1916 of from 32 to 67 per cent., the actual increase in the price to the farmer did not on any of the above crops exceed 10 per cent.; while in the case of potatoes there was a decrease of 8.5 per cent. Considering shrinkage in storage, losses due to disease, etc., and the average price paid to growers of potatoes to the end of 1917—i.e., $23.10 per ton—the grower selling his potato-crop at or even a little above the average price has lost money on the crop.

FARM AND CROP INSPECTION.

Over 1,000 farms were visited by officials of this Division during the year and land or crops inspected. A number of farmers were visited and seed-plots scored for the Canadian Seed-growers' Association.

In addition to the above, officials of the Division assisted with the judging of the Boys' and Girls' Club competitions. One hundred and two potato-plots were scored during the growing season. Harvested exhibits from the plots were scored at the Provincial seed fairs, and the financial reports and essays received and scored at this office.

MEETINGS, SHORT COURSES, AND FALL FAIRS.

Officials of the Division conducted or delivered addresses at twenty-one farmers' meetings during the year. The wide range of subjects included underdrainage, fertilizers, soils, seed-growing, potato-growing, weed-eradication, mixed-farming crops, and crops for ensilage.

Judges were supplied who assisted in the placing of the awards at a number of the fall fairs.

CORRESPONDENCE.

The correspondence for the year consisted of 1,869 letters being filed and 2,562 dispatched. This is an increase of 15.3 per cent. over 1916 and an increase of 39 per cent. over 1915.

Respectfully submitted.

H. O. ENGLISH,
E. W. HOGAN,
Soil and Crop Instructors.

ANNUAL REPORT OF CHIEF VETERINARY INSPECTOR.

A. KNIGHT.

W. T. McDonald, Esq.,
Live Stock Commissioner, Department of Agriculture, Victoria, B.C.

SIR,—I beg to submit my report of the Veterinary Division for the year ending December 31st, 1917.

The early part of the year was devoted to meetings of various Farmers' Institutes, more particularly in the Okanagan and Kootenay and Columbia River Valleys. The report on these meetings has been submitted.

Considerable time was given to assisting stock-owners in the outlying districts by correspondence for the common ailments among their stock, and in a number of instances a personal visit was made and treatment advised.

VERMINOUS BRONCHITIS.

The experience of your Inspectors during the year with this trouble was confined to young stock, mostly under one year of age. The disease was confined to those localities as reported in 1916; that is, those lands subject to overflow in the early summer and after the water has receded. Treatment was adopted as advised on stock already affected, with good success, and the fatalities were practically *nil*. Stock-owners were also advised to keep young stock off contaminated pastures, as a precautionary measure.

INFLUENZA.

An outbreak was reported from the Columbia Valley, where two horses had died. On investigation it was found that death was due to pneumonia, following an attack of influenza. The remaining affected animals were isolated and treated. No further trouble was reported from this source.

CONTAGIOUS ABORTION.

This trouble, which was reported widely in previous years apparently gave very little concern in 1917, only two outbreaks being reported. The one case, your Inspector is satisfied was due to mechanical means, and not of a contagious nature. In the other case, by isolation and treatment by use of disinfectants the trouble was confined to three cows in the herd.

SANITARY CONDITIONS OF DAIRIES AND STABLES.

In the older and more progressive districts some improvements have been noticeable; the erection of new stables, more light, better floors and drainage have been adopted, and more thought given to the health and comfort of stock. Other sections are making little, if any, improvement, especially in those localities where the owners of farms have retired and the farms are leased; the owner refuses to expend money on improvements, and the renter refuses to improve the buildings unless he has a long lease. Those dairymen with Grade A premises, it is believed, are maintaining their standard for quality of their dairy products, and this may be said also of a good many of the Grade B class.

TUBERCULOSIS.

The time of the Veterinary Inspectors was devoted largely to dealing with this disease. During the year 15,398 head of cattle on 1,889 premises were tested, with the result of 579 reactors and 54 suspects. Of these reactors 526 were killed; 53 reactors and 54 suspects remain in quarantine. The great bulk of these will be disposed of very shortly. The number of reactors to the number tested figures out at about 3.75 per cent., which result is very gratifying compared with previous years, more especially since this work has been confined to the more thickly settled districts and where tuberculosis was more prevalent in former years. (For districts in which the cattle have been tested, number of premises visited, cattle tested, reactors, and suspects, *see* Appendix No. 15.)

Respectfully submitted.

A. KNIGHT,
Chief Veterinary Inspector.

ANNUAL REPORT OF DISTRICT AGRICULTURIST, KAMLOOPS.

GEO. C. HAY.

W. T. McDonald, Esq.,
Live Stock Commissioner, Department of Agriculture, Victoria, B.C.

SIR,—I beg to submit my annual report as District Agriculturist for the Kamloops District in 1917.

ACTIVITIES.

During the year 1917 your Agriculturist has served in his capacity for two different districts. The first six months of the year were spent at Smithers as headquarters for the Bulkley Valley, Central British Columbia, and the balance of the year at Kamloops as headquarters for the surrounding district, including Cariboo, Lillooet, and the Nicola Valley.

The time during the winter months was mainly spent in holding institute meetings at different points along the Grand Trunk Pacific Railway and in making personal visits to as many of the ranchers as could be conveniently visited. In the early spring the applications for seed-grain were received, and three car-loads distributed to the applicants before your Agriculturist left early in June for the Kamloops District.

After reaching Kamloops an endeavour was made to cover that district in so far as possible, and while doing so meet the settlers and discuss their problems with them, and become familiar with conditions in the different localities, as well as the individual problems confronting the settlers therein. This, together with the supervision of the two dry-farming stations at Quilchena and 105-Mile House, kept your Agriculturist busy during the latter six months of the year.

LIVE STOCK.

The Kamloops and Cariboo Districts have for many years been famed for beef-raising. They are recognized to-day as amongst the largest, if not the largest, open range countries in Western Canada. The cattlemen have had a good year. Beef has been a good price and many car-loads have been shipped out. This high price, however, has not influenced the cattlemen to dispose of their breeding animals as might be supposed. All are assured of a stable market for some years to come. In almost every case breeding animals have been conserved in so far as it was possible. The small hay-crop last season rendered it necessary for some of the owners to diminish their number of cattle. The late winter now is of untold value to them in bringing their cattle through in good shape.

Dairying has been successfully practised to some extent in the vicinity of Kamloops. A creamery was opened in the town in June, 1917, and by December 31st 15,000 lb. of butter had been made. This creamery has fifty patrons at the present time, and several other farmers have expressed their intention of starting in dairying, thus making the outlook promising.

The sheepmen in the Kamloops-Cariboo District did exceptionally well on their flocks in 1917, due chiefly to the high prices paid for wool and mutton. However, a small proportion of the wool sold in this district realized the top market price. A very small number of the ranchers co-operated and sold their wool through the Wool-growers' Association at Kamloops. It is believed, however, that the results of marketing wool co-operatively were demonstrated sufficiently by the association last year that it will have practically all the wool in the district to handle next spring.

CROPS.

The season of 1917 was anything but favourable to the development of good crops throughout most parts of the Kamloops District. The cold, backward spring seriously withheld the growth of most crops, and later during the months of July and August a continued spell of dry weather seriously affected those who were practising dry-farming. The crops in the Nicola Valley, generally speaking, were better than those in most other districts, especially the oat-crop. The hay-crop in general was light, and at present the ranchers realize there is not a superabundance of hay in the country for the number of cattle that are being kept over.

Summer frosts towards the latter part of July caught some of the crops in places along the Cariboo Road and in the Bonaparte District. The potatoes in several places did not recover from a frost that occurred on July 24th. No frosts occurred in the Thompson River Valley until October, when beans were damaged somewhat in several sections.

FALL FAIRS.

The fairs visited during the past season were: Knutsford, Vancouver, Prince George, Hefferly Creek, Armstrong, Kamloops, Quesnel, and Summerland. Of these, your Agriculturist judged the cattle at Knutsford, the live stock and field produce at Prince George and Quesnel, and the live stock at Summerland. At the fairs attended a good interest was shown and a keen desire on the part of the exhibitors to help the fair along.

FIELD-CROP COMPETITIONS.

The field-crop competitions judged during the summer were as follows: Wheat and potatoes for the Martin's Prairie Farmers' Institute, and oats for the Nicola Valley Farmers' Institute. The Roe Lake Institute found it necessary after a rather severe frost to call off their crop competition for the season. The three competitions at Pritchard and Nicola were very well conducted, and, generally speaking, there was keen competition; especially was this the case with the Nicola Valley oat competition.

OFFICE.

The patronage to this office on the part of the local farmers and of those interested in the work of the Department of Agriculture is most encouraging. A live interest has been taken in the work, and anything that the Department can do to further the interests of agriculture in the District of Kamloops is greatly appreciated by all concerned.

Respectfully submitted.

GEO. C. HAY,
District Agriculturist.

ANNUAL REPORT OF SILO DEMONSTRATOR.

R. J. FERRIS.

W. T. McDonald, Esq.,
Live Stock Commissioner, Department of Agriculture, Victoria, B.C.

SIR,—I beg to submit herewith my report of the silo-demonstration work for the year 1917.

As the work of this part of the Live Stock Branch develops, there is an increasing desire by the farmers of British Columbia to become more acquainted with the merits of silage as an aid to the cheaper production of live stock. Operations have covered to a large extent the southern part of the Province, where on every hand the familiar type of silo which the Department has advocated for the last three years is observed. The initial policy of placing the silos in the outlying districts, such as the Okanagan, Arrow Lakes, Kamloops, etc., instead of the more thickly settled parts of the Province, has proved a first-class method of advertising, with the result that they are now being built more rapidly. The offer of assistance to the first farmer in an institute district who erects one of the type of silos recommended by the Department has taken advantage of by 30 per cent. of the Farmers' Institutes. There are still a large number of institute districts where they have not yet begun to feed silage to their cattle, which is an economic necessity, and the modern dairy-farm is not complete without a silo.

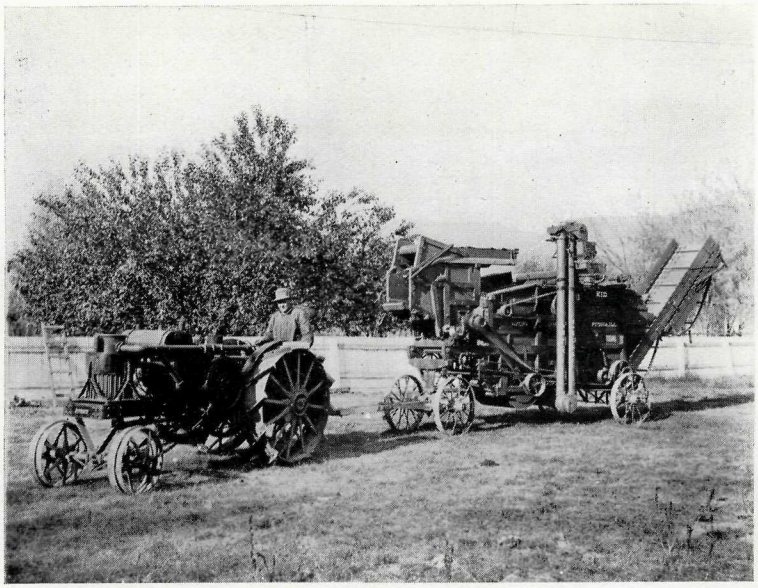
Under your instructions, a circular entitled "The British Columbia Farmer and his Silo" was compiled. The information it contained has been the means of a large number of farmers building silos. Some 2,500 of these circulars were printed and 2,400 have been distributed. There has also been a large demand for the bulletin entitled "Silos and Silage."

The correspondence in connection with this work is increasing: Letters received, 320; letters sent out, 450.

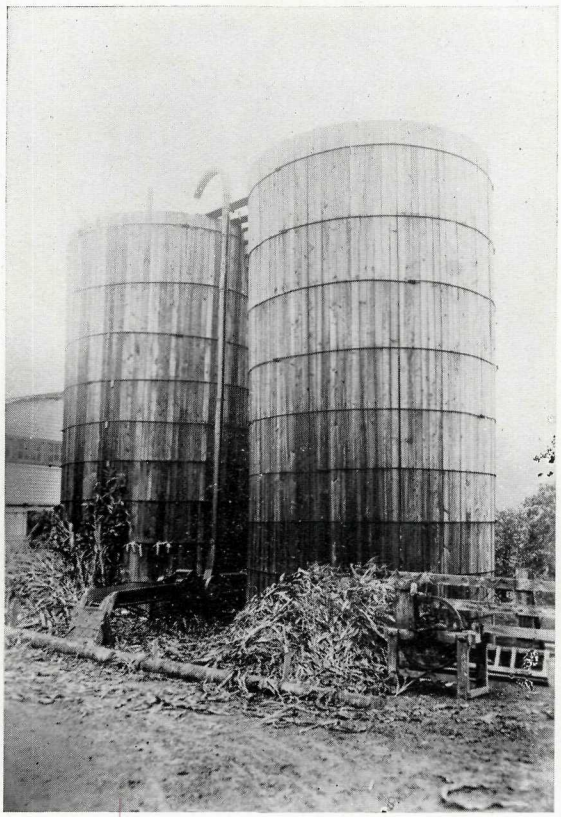
Twenty-three silos have been erected by the Department representatives and thirteen filled. (For tables showing silos built and filled *see* Appendices Nos. 16 and 17.)

Respectfully submitted.

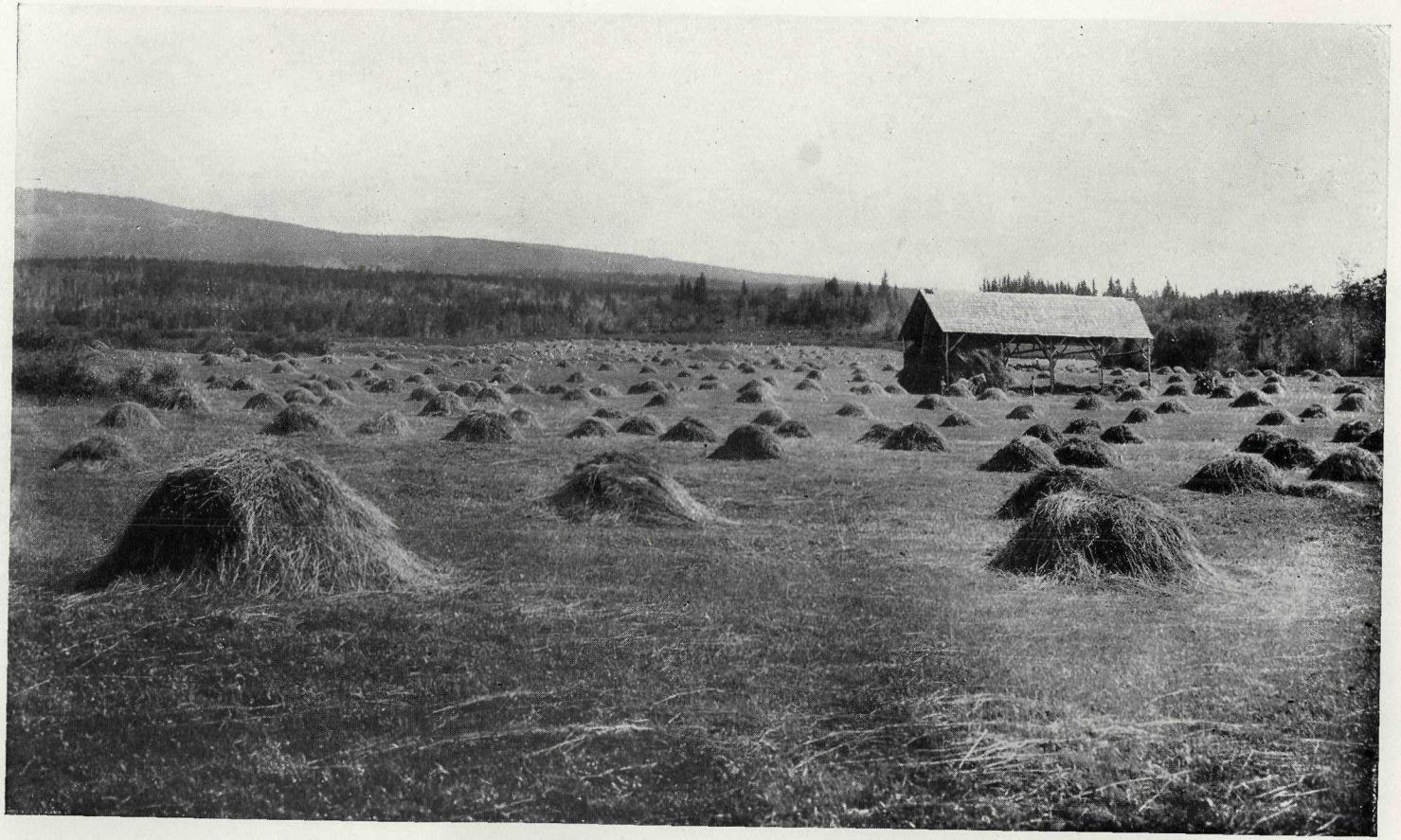
R. J. FERRIS,
Silo Demonstrator.



Clover and alfalfa huller, owned by Department of Agriculture, Victoria, B.C.



Home-made silos on a British Columbia farm.



A good crop of timothy in the Bulkley Valley.

REPORT OF PUBLICATIONS BRANCH FROM NOVEMBER 5TH TO DECEMBER 31ST, 1917.

M. A. STUART.

W. T. McDonald, Esq.,
Live Stock Commissioner, Department of Agriculture, Victoria, B.C.

SIR,—I have the honour to submit herewith a brief report of the work of the Publications Branch from November 5th to December 31st, 1917.

On taking temporary charge of the work of this Branch following J. R. McLennan, the duties assumed were as follows: The publication of the *Agricultural Journal*, mailing out bulletins, etc., issued by the Department, and answering correspondence in connection with the Branch.

OFFICE.

During the last two months of the year, 196 letters were received from farmers, Secretaries of Farmers' Institutes, and various other agricultural organizations, asking for bulletins and other publications. A number of subscriptions to the *Agricultural Journal* were received from both old and new subscribers. There were sent out 93 letters and 106 bulletins to various farmers, Secretaries of Farmers' and Women's Institutes, Agricultural Colleges and Schools, and Departments of Agriculture throughout Canada and the United States.

AGRICULTURAL JOURNAL.

This *Journal* at the end of the year contained twenty pages, but judging by the rate material is now coming in from outside, and the lengthy articles written by members of this Department, an increase of eight pages more will be necessary. The mailing-list, together with the names of subscribers, are so arranged in alphabetical order on filing-cards that in future the mailing of the *Journal* and other publications will be much easier.

I hereby acknowledge the valuable assistance rendered this Branch by members of the Department and outside correspondents in supplying articles for the *Journal*.

Respectfully submitted.

M. A. STUART, *Agriculturist.*

ANNUAL REPORT OF SECRETARY FOR THE DEPARTMENT OF AGRICULTURE.

WM. J. BONAVIA.

Wm. E. Scott, Esq.,
Deputy Minister of Agriculture and Superintendent of Institutes,
Department of Agriculture, Victoria, B.C.

SIR,—I have the honour to submit herewith my report on the general work of the Department for the year ending December 31st, 1917.

STAFF.

The Estimates for the fiscal year ending March 31st, 1918, provided for forty-four permanent officials of all ranks. The year has been marked by an unusual number of resignations; the following table briefly records the details:—

Resignations.

Name.	Rank.	Remarks.
A. R. Neale	Assistant Horticulturist, Prince Rupert	Taking up general farming in the Kootenays.
J. H. McCulloch	District Agriculturist	Newspaper-work at Winnipeg.
W. E. McTaggart	Prairie Fruit Markets Commissioner, Calgary	Newspaper-work at Winnipeg.
A. H. Thornber	Assistant Horticulturist, Victoria	Experimental Sub-station, Corvallis, Montana.
S. H. Hopkins	Assistant Live Stock Commissioner, Victoria	Instructor in Elementary Agriculture, Education Dept., Duncan.
R. M. Winslow	Provincial Horticulturist	Private business.
J. R. McLennan	Editor, *Agricultural Journal*, Victoria..	Newspaper-work at Vancouver.
H. E. Walker	District Agriculturist, Prince Rupert..	Superintendent, Experimental Farm, Killarney, Man.
G. H. Stewart	Accountant, Victoria	Royal Flying Corps, Toronto, Ont.

Roll of Honour.—During the year officials of the Department were grieved to hear of the death of Captain F. Norman Payne, who had enlisted in 1915 with the 2nd C.M.R., and after training in England proceeded to Mesopotamia, where he went through the campaign for the relief of Kut-el-Mara and the capture of Baghdad. His death from cholera at the latter place was reported in November.

The death was also reported through the press of Lieutenant Bernard Shipton, who died of wounds in France. He had also enlisted with the 2nd C.M.R. and won the Military Medal, while the Military Cross was awarded to him after his death.

Flight-Lieutenant Charles Rayner had been an Assistant Inspector with the Inspector of Fruit Pests from the years 1911 to 1914 and was regarded as a very promising official. Enlisting in 1915, he soon obtained a commission and changed to the Royal Flying Corps. He met his death late in 1917.

Temporary Staff.—Following the usual procedure, a number of appointments of temporary officials were made, in addition to the temporary officials already employed, in connection with such matters as inspection of orchards, inspection of fruit at ports of entry, judges at fall fairs, etc. The total number of these appointments during the year was 109, as compared with eighty-three in 1916, these appointments being about equally divided between Provincial expenditure and that under the "Agricultural Instruction Act." (Appendix No. 18 will show the nature of the appointments.)

CORRESPONDENCE.

The correspondence has again shown a slight upward tendency; the total number of letters received during the year being 21,430, as against 20,897 in 1916. Letters dispatched showed a considerable increase over 1916, the figures being 24,952 and 21,856 respectively. The general increase in the inward letters was those due to the Live Stock Branch, whilst the letters sent out from the Deputy Minister's office during the year again constitute a record, being 45.4 per cent. of the total number dispatched.

Circular Letters.—The total number of circular letters sent out was 32,040, as against 46,680 in 1916. These letters were divided under eleven headings, as per attached statement. The decrease in the number due to a larger number of individual letters being sent, and also the lessened activities of Farmers' Institutes and Agricultural Associations.

Agricultural Associations	1,135
British Columbia Dairymen's Associations	965
British Columbia Fruit-growers' Associations	4,950
Horticultural Branch	4,100
Farmers' Institutes	5,780
Miscellaneous	1,005
Poultry Division	6,850
Publications Branch	1,025
Statistical Branch	1,380
Soil and Crop Division	3,700
Women's Institutes	1,150
Total	32,040

Publications issued during 1917.—(*See* Appendix No. 20 for detailed statement.)

New Publications.—Less bulletins and circulars have been issued during 1917 than in previous years, owing to the large stocks carried forward; the total editions of new bulletins, circulars, and miscellaneous publications amounting to 88,400 copies. The *Agricultural Journal* was published throughout the year, with an average circulation of 4,000 copies per month. (*See* Appendix No. 20 for full list of publications.)

Bulletins and Circulars dispatched during the year.—The actual number of publications dispatched by mail during 1917 was 115,811, including the copies of the *Agricultural Journal.* Information dealing with poultry was much in demand and publications on the subject of general farming. (*See* Appendix No. 21 for full list.)

FINANCIAL.

The financial appropriation for this Department totalled $208,002, as against $251,996 for the previous fiscal year, the chief reduction being in grants made to various associations, sup-

pression of noxious weeds, etc. (Appendix No. 22 will give a summary of the appropriations compared with those in previous years.)

During the year a special warrant of $7,000 was obtained by Order in Council for stocking and operating the Frondeg Farm, on Vancouver Island, which had been turned over to the Government of the Province by Griffith Hughes, rent free, for a period of five years.

"*Agricultural Instruction Act.*"—Instalments were again received from the Federal Governments as follows:—

January 19th, 1917, second half of 1916-17 grant	$31,866 25
August 6th, first half of 1917-18 grant	34,599 63
Total	$66,465 88

As stated previously, a large number of temporary appointments of Inspectors and Instructors were made possible by the moneys provided under this Act.

The annual increase for the period 1917-18 was $5,466.56. This, however, was offset by the grant to the Education Department on account of elementary instruction being increased from $15,000 to $20,000.

The number of vouchers issued during the year was 1,248. The number of cheques from the special account at the Canadian Bank of Commerce was 1,261. The total number of Provincial vouchers issued during the year was 2,498, making a grand total of 3,746 vouchers issued. (*See* Appendices Nos. 23 and 24 for sections of the "Agricultural Act, 1917-18," and for details of vouchers issued.)

SEED-GRAIN DISTRIBUTED IN 1915 AND 1917.

Year 1915.—Payments from Government Agents responsible for the collection of promissory notes given by settlers in 1915 have come in but slowly during the year, the total amounts collected being $1,108.92, leaving a balance of $5,782.15, distributed as follows:—

Government Agent at	Fort Fraser	$ 57 80
" "	Cranbrook	626 14
" "	South Fort George	300 42
" "	Greenwood	129 00
" "	Vernon	1,203 88
" "	Nelson	165 93
" "	Kamloops	1,444 05
" "	Vancouver	1,854 93
Total		$5,782 15

The Government Agents reported that many of the parties who were supplied with seed-grain have gone overseas, whilst a few have left the Province for other parts of the Dominion, so that unless a special effort is made by legal process to recover the amounts due there will probably be a large deficit.

Year 1917.—Representations having been made to the Government that settlers in the area of Tete Jaune Cache and Hazelton were so situated financially, owing to the failure of the harvest in 1916, that they were unable to provide seed for the 1917 crop, Orders in Council were accordingly passed as follows:—

January 8th, 1917	$ 3,000
February 26th, 1917	7,000
Total	$10,000

The Department officials at once took the matter in hand, seed-grain to the sum of $7,031.07 being purchased and distributed along the line of the Grand Trunk Pacific Railway promptly. Freight and handling charges amounted to $1,488.11, making a total cost of this work $8,519.18. Promissory notes did not fall due until December 31st, 1917. Indications are that prompter payments will be made than in connection with the year 1915.

BRITISH COLUMBIA STUDENTS.

Owing to the University of British Columbia now providing a first-year's course in agriculture, the number of students leaving the Province for Eastern colleges to take up such work

has decreased considerably, and the Honourable Minister of Agriculture has made a ruling that no grant will be made to British Columbia students who commence an agriculture course outside the Province, but the grants will still be made to students who wish to take a second- or third-year course or full graduation at Eastern colleges. The names of the students for the year 1917 are as follows:—

Ontario Agriculture College.—Spring term, 1917: First year, Cecil C. Evans, Mary Gertrude Steele, Mildred E. Ruttan, Arthur Jas. Mann, Herbert Butters, and Geo. Patchett; second year, Miss Mabel A. Witmer; third year, Harold L. Davis; fourth year, A. H. White and Oliver C. Evans. Fall term, 1917: First year (no grant), Charles James Butt; second year, George Patchett; third year, George Knowles; fourth year, Leslie Harold Davis and Arthur James Mann.

Manitoba Agriculture College, Winnipeg.—Spring term, 1917: First year, Donald Budge; second year, Ross MacKinnon; fourth year, David W. Robertson. Fall term, 1917: Course in Agriculture, D. W. Robertson and R. E. Wells; Course in Home Economics, Miss Gladys E. Hallwright and Miss Florence M. Elliott.

Macdonald Institute.—Fall term, 1917: Home Economics, Associate Course (two years), Miss Gundrid M. Rebbeck.

University of Toronto.—Fall term, 1917: Household Science Course, Miss F. L. Fullerton.

HORTICULTURAL LICENCES.

Thirty-nine horticultural licences of principals and agents were issued during the year, as against thirty-five in 1916. These were made up as follows:—

Principals, nurserymen, foreign and British Columbia	22
Agents, nurserymen, foreign and British Columbia	17
Total	39

A good feature of the year's work has been the establishment of a nursery by one of the firms who had the majority of the importation-work. Energetic action was taken by the Horticultural Branch and the Provincial police in connection with possible infractions of the Statute, but there are several cases of nurserymen who claim their business does not justify them putting up the $25 necessary for a bond and licence.

BEE-INSPECTION WORK.

Following the procedure in previous years, temporary appointments of Inspectors were made to inspect the apiaries of the Province and give advice and practical demonstrations. The season of inspection lasted from April 18th to August 31st. F. D. Todd, of Victoria; L. Harris, of Vernon; and W. J. Sheppard, of Nelson, were again employed for the districts covered by them in 1916. The expense of this work was borne from a special section of $2,500 provided in the "Agricultural Instruction Act, 1917-18." Compensation was again paid to owners of hives whose premises had been inspected and condemned on account of the presence of foul-brood, a total sum of $312.85 being expended in this connection.

AGRICULTURAL FAIRS ASSOCIATIONS.

For the first time for many years no new associations were incorporated during 1917. Owing to the necessity of economy no annual convention was called by the Department, but arrangements for dates of fairs were made by correspondence, the associations being circularized as to the most suitable dates and the final decision left to the Department.

Although some fifty-six fairs were originally arranged, forty-eight were finally held; forty-three of these being by incorporated associations, four by Farmers' Institutes, and one by a Horticultural Society. (For details of dates and places *see* Appendix No. 25.)

Judges.—Thirty-seven staff and outside judges were supplied by the Department to Fair Associations, as against thirty-nine in 1917.

The following statement shows appointments for years 1916-17:—

Judge.	1917.		1916.	
	Staff.	Outside.	Staff.	Outside.
Live stock and dairy products	2	11	7	9
Poultry	2	6	2	6
Fruit and vegetables	11	2	11	3
Honey, etc.	...	3	...	1
Totals	15	22	20	19
	37		39	

Reports sent in by judges were, on the whole, encouraging, especially those from the poultry judges; the improvement in the number of entries of birds and the excellent condition of same being very noticeable. Generally speaking, however, the displays of fruits and vegetables were good in quality, but were lacking in quantity; this being partly due to the shortage of labour preventing exhibitors from preparing exhibits and attending fairs, and also to the rather dry season experienced. There is no doubt, however, that the determination of districts to continue holding these fairs during war-time is a good one. A special feature of the fair season was the sending round of pathological exhibits to Duncan, Victoria (Home Products Fair), Coquitlam, Langley, Kelowna, Grand Forks, Nelson, and Summerland. These exhibits drew attention to the various diseases affecting horticultural products, and J. W. Eastham, Plant Pathologist, and his Assistant, M. H. Ruhmann, were in attendance to give explanation and advice.

Financial.—The appropriation for Fair Associations was $20,000, of which $12,850 had been awarded in grants in aid of prize-lists. (*See* Appendix No. 26 for details.)

FARMERS' INSTITUTES.

The total number of institutes existing at the end of the year was 148. There were five new institutes organized in 1917, whilst three—Vargas, Okisollo, and Nitinat—were temporarily closed down during the continuance of the war. The new incorporations were as follows: January 10th, Houston Farmers' Institute; January 25th, Westside Okanagan Farmers' Institute; February 6th, Trapp Lake Farmers' Institute; March 19th, Roe Lake Farmers' Institute; May 7th, Similkameen Farmers' Institute.

Several institutes have lost so many members that they may be regarded as dormant during the continuance of the war, and no grants were possible to those whose membership was below fifteen. The total membership recorded for the year was 6,194, as against 6,974 in 1916. The institutes with the largest membership were as follows:—

Creston	232
Spallumcheen	192
Francois Lake	137
Nanaimo-Cedar	130
Delta	129
Cowichan	119
Martin's Prairie	119
Surrey	108
Bella Coola	97
Northern Okanagan	94

The Advisory Board of Farmers' Institutes met at Victoria in February and dealt with the resolutions submitted to the Department. District meetings were also held in the Okanagan and Kootenay Districts, and the Department is now perfecting a scheme of grouping all institutes into nine districts corresponding with the electoral districts of the Province, and a new Advisory Board will be appointed in accordance with the 1917 amendment to the "Agricultural Act, 1915."

Financial.—The Estimates for 1917-18 reduced the institute vote to $15,000, the total expenditure at the close of the calendar year being $12,633.02, as shown in Appendix No. 27. The total cost of a Farmers' Institute to the Department was $85.36, as against $103.35 in 1916-17.

Short Course and Lectures.—The programme for the winter meetings comprised forty-two institutes in the itinerary, the period extending from February 16th to March 17th. (*See* Appendix No. 28 for full list.)

A short course in general agriculture and horticulture was again arranged to be held from February 5th to 16th. The subjects dealt with were live stock, breeds and management; feeding stock; cattle-diseases and first aid; succulent crops; field crops; forage-crops; soil-treatment; vegetable-growing; potatoes, varieties, etc.; fertilizers; orchard insects, insect pests, plant-diseases, sprays, etc. Demonstrations were given in poultry and in dairy and live-stock judging. The co-operation of the British Columbia University was very heartily appreciated.

The lecturers included the following: Professor J. A. McLean, Professor P. A. Boving, Dr. A. Knight, H. O. English, T. A. F. Wiancko, J. R. Terry, M. S. Middleton, B. Hoy, and J. W. Eastham.

The interest evidenced and the attendances, however, were rather disappointing, both at the short course and at many of the institute centres.

Fairs held by Farmers' Institutes.—In 1917 only four institutes held fairs, as against seven in the previous year; the dates were as follows: Evergreen (San Josef Bay), September 13th; Cape Scott, September 17th; Denman Island, September 18th; Rock Creek, October 26th; Pouce Coupe. The Department again sent judges to the first four by special request.

WOMEN'S INSTITUTES.

During the year only one new institute was organized, this being the Tillicum Women's Institute on December 29th. The total membership for the year was 2,754. The following table will show comparison with the two previous years:—

	No. of Institutes.	Membership.
1915	56	2,994
1916	60	3,039
1917	61	2,754

In the early part of the season membership returns were so encouraging that it looked as though, in spite of the decreased population in the Province, membership records would again be broken. At the time of this report annual returns from institutes are still coming in, and it is not possible to give a full account of the activities of same, but extraordinary efforts have been made during the year in raising funds for patriotic purposes. The total value of cash contributions by Women's Institutes to various patriotic organizations exceed $16,000, whilst some 21,000 articles were sent overseas. (*See* Mrs. Davies's report for details.)

The institutes with the largest membership during the year were as follows:—

Kelowna	185
Cowichan	167
Cranbrook	138
Penticton	105
Creston	98
Shawnigan and Vernon	79

The average membership for all institutes was forty-five, as against fifty-one in 1916.

Financial.—The Department again secured the vote of $7,500 for Women's Institutes, including educational work, for the fiscal year ending March 31st, 1918. The total actual expenditure on this work was $8,742.03 for the calendar year, the average cost of an institute having risen to $148.17, as against $104.28 the previous year. (*See* Appendix No. 29 for full details.)

Conferences.—District conferences were again held as in 1916, as follows: Okanagan District, at Vernon, September 18th to 20th; Kootenay and Boundary District, at Cranbrook, September 25th to 27th; Vancouver Island, at Duncan, October 3rd to 5th; Lower Mainland, at Mission City, October 11th and 12th.

These conferences were run in a very business-like manner. A large number of resolutions dealing with women and children were submitted to the Department at the close of the year for

action. Only actual expenses of official delegates were paid by the Department; the institutes in several cases bore the expense of one or more delegates themselves.

Lectures and Demonstrations.—Mrs. J. S. Chalmers, of Thrums, B.C., continued her lecture-work to the institutes which she had not visited at the close of 1916. Her third, fourth, and fifth itineraries took up her whole time from January 5th to May 2nd.

There has never been such a highly successful series of lectures and demonstrations to institutes provided by the Department before. Mrs. Chalmers won golden opinions from every district she visited, and there is no doubt her practical advice and clear demonstrations have stimulated interest, not only amongst the Women's Institutes, but also in many cases of the farmers of each district.

Flower-shows.—Forty-one institutes held flower-shows and were paid the grant for same, as against forty-three in 1916. The Department was not able to appoint horticultural judges from the staff, as had been done previously, owing to being short-handed. From reports received, however, both the financial and social sides of these events were very satisfactory. (*See* Appendix No. 30 for list of dates.)

Competitions, Year 1916.—These competitions were not decided until rather late in 1917, the winners being as follows:—

(*a.*) Best Average Attendance at Meetings based on June Membership.—First prize (books, $20), Upper Sumas, 77 per cent.; second prize (books, $10), Gordon Head, 74.4. Next in order of merit: Nakusp, 74.3; Crawford Bay, 68.4; Robson, 66.8; Lake Hill and Mission, 66.6; Cranbrook, 64.9; Penticton, 60.7; Harrop, 60.3.

(*b.*) Programme Competition.—First prize (books, $15), Salmon Arm; second prize (books, $10), Nelson. Next in order of merit: West Saanich, Haney, Chilliwack, Agassiz, Surrey, Naramata, West Summerland, Hazelmere, Summerland, and Langley.

(*c.*) Essay Competition.—First prize ($10), Mrs. Henry Calhoun, Tappen Institute (subject, "Reading-matter for the Home"); second prize (specially raised to $10 on account of merit), Mrs. E. H. Lock, Summerland Institute (subject, "The Importance of Vocational and Technical Training"); third prize ($5), Mrs. A. John Grigg, Vice-President, Nakusp Institute (subject, "Economics in the Home"). Specially mentioned: Mrs. E. L. Winson, Upper Sumas Institute (subject, "Reading-matter in the Home"); Mrs. V. S. MacLachlan, Garden City Institute (subject, "Economics in the Home.")

(*d.*) Competitions for Junior Members.—No prizes awarded.

The programme competition attracted a large number of competing institutes, and the first twelve were all excellent and deserving of note.

The competitions for 1917 follow similar lines, institutes having been given to March 31st, 1918, to send in essays and other matter.

GENERAL.

The new scheme of allowances authorized by the 1917 amendment to the "Agricultural Act, 1915," whereby the Department paid a $1 *per capita* grant for each first fifty members of an institute who paid a like amount, has resulted in a larger sum being paid to institutes, although many of the latter have written in hoping that the Secretary's allowances, which had been discontinued, would be revived. Owing to the activity of institutes, supplies of stationery, books, etc., now amount to a considerable annual charge, the same having risen from $190.86 to $1,257.94 in 1917.

An interesting feature in the year's work was the holding of a "better babies" contest on August 1st by the Garden City Women's Institute. The institute year has been one of intense activity, each institute vying with the other in its output for material for the Red Cross and other patriotic societies in connection with the Great War.

NOXIOUS WEEDS.

No special vote for the suppression of noxious weeds was provided in this year's Estimates, and work of this nature was delegated to Provincial constables, acting as agents for the Department, whilst an Order in Council was approved on June 3rd appointing all District Forest Rangers and Assistant Rangers of the Forest Branch to be Inspectors under the "Noxious Weeds Act." Full reports are not yet to hand, but the expenditure in cutting noxious weeds on absentee-owner property has only amounted to about $500. It is probable that agriculturists

and owners of property who are interested in increased production are taking greater care to look after the land, and the vigorous campaigns conducted by this Department in 1914, 1915, and 1916 are also bearing fruit.

All of which is respectfully submitted.

WM. J. BONAVIA,
Secretary.

ANNUAL REPORT OF STATISTICS BRANCH.

A. B. TWEDDLE.

Wm. E. Scott, Esq.,
Deputy Minister, Department of Agriculture, Victoria, B.C.

SIR,—I have the honour to submit my annual report on the work of the Statistics Branch during the year 1917.

SCOPE.

With the beginning of the current fiscal year, supervision of the work of this Branch was assigned to your present Statistician.

In scope, the work was much the same as during the previous five years—that of collecting data relating to agricultural production, imports and exports—but methods varied in part.

During the three years 1914-15-16 the plan used in collecting information respecting production was by personally visiting as large a number of representative farmers as possible. The scheme adopted in 1917 was in accordance with one of the many recommendations submitted in 1912 by a Commission to inquire into the statistics of Canada, appointed by the Federal Government. This recommendation was that statistics relating to agricultural production in Canada be collected annually and by joint effort of the Federal and Provincial Governments, thereby doing away with much duplication of effort and conflicting results. This recommendation was strongly endorsed by a conference consisting of representatives of both the Federal and Provincial Governments and held at Ottawa in 1914 for the purpose of informal discussion of statistical matters in the light of the report of the Commission. As a result of the understanding of this conference, a scheme was drafted by R. H. Coats, Dominion Statistician and Controller of Census, for the collection of statistics relating to crop areas and live stock in 1917, and which was adopted by the Provinces of Quebec, Manitoba, Saskatchewan, Alberta, and British Columbia.

This scheme provided for the mailing of card schedules direct from Ottawa to all agriculturists in this Province whose names appeared on the Provincial voters' lists of 1916. Returns were required to be forwarded to this Department and there compiled.

RESULTS OF 1917 METHOD.

Some 19,300 cards were distributed in British Columbia. About 4,300 were returned through the Dead Letter Office owing to "enlistment," "dead," "removed," etc., whilst approximately 7,000 were duly filled out and forwarded to this office, which represents 46 per cent. of the estimated number of actual farmers in the Province at that time.

Considering an initial experiment, this may be accepted as a very satisfactory response, and is the second highest percentage secured by any of the Provinces where this scheme was adopted.

The time available for the completion of details of this plan prior to putting same into operation on the scheduled date was limited, thus rendering impossible the necessary campaign. However, with improved details, an up-to-date mailing-list, an effective campaign toward educating farmers in the importance of statistics, and which has already been started through the medium of the Department journal, future results will undoubtedly prove much more satisfactory.

By the adoption of this method and its operation with clear definition, the collection of statistics will not only be placed on the most economical basis, but results will form a sound basis on which to determine annual progress of the agricultural industry.

COMPARATIVE RESULTS, 1916 AND 1917.

Comparing results of the 1917 method with those of the previous year, when only general information could be obtained, it is noted in the case of the total area of grains that the 1917 figure was 0.5 per cent. and that of fodders and roots 9 per cent. higher. In numbers of live stock, however, the 1916 estimates were apparently too optimistic, being from 2.6 per cent. in the case of dairy cattle to 15 per cent. in that of horses higher than the 1917 results show, and which demonstrates clearly the impossibility of determining the numbers of live stock by any means except a census. Many farmers may have a fairly reliable knowledge of crop areas, but in the majority of cases they know little about live-stock progress.

CROP CORRESPONDENTS.

For the purpose of obtaining information from time to time relating to crop conditions, yields, values, etc., some 200 farmers, Secretaries of Farmers' Institutes, and Department officials were asked to submit periodical reports to this office, whilst the Federal office appointed an equal number who were asked to report to that office. Separately compiled results from these two sets of correspondents were then exchanged by these two offices, and the average result, mutually agreed upon, adopted and published.

IMPORTS AND EXPORTS—COLLECTION OF DATA.

In the continued absence of data from the transportation companies relating to the volume of interprovincial trade, particularly inward movements, the same method which has been in use since 1914 was adhered to—viz., the collection of the required data from the chief wholesale establishments within this Province. Forms were mailed to over 500 establishments, asking for a return of the total quantity and value of Canadian food products imported from all the other Provinces during the year. Results have not been as satisfactory as desired, since only about 50 per cent. responded, but which is doubtless partially due to the prevailing shortage of clerical assistance. With the data secured in former years, it will, however, be possible to determine fairly well the year's imports into the Province. Export data are being supplied by the various shippers, Department officials, and transportation officials.

PUBLICATIONS.

During the year the annual statistics bulletin for the year 1916 was compiled and published; also three circular bulletins containing results of the various crop returns, these latter being distributed amongst the various newspapers, farm journals, etc., for publication.

Statistical articles were supplied from time to time to the departmental journal.

COST OF PRODUCTION.

Through the efforts of the Soil and Crop Division, data relating to the cost of producing certain field crops have been collected in recent years. It became desirable that such data should be extended to include all crops, as well as live stock, and these, to begin with, based upon a complete inventory of the farm. By mutual arrangement with the Soil and Crop Division, the work already being conducted under its supervision was surrendered to this Branch.

It is planned to begin this work the first of February next, and the necessary details are now nearing completion. These include the selection of about 400 carefully chosen farmers who will undertake the necessary recording for one year along the lines of forms and diaries now being printed.

Similar work has been carried on in some sections of the United States for the past fifteen years, and at the outset results proved very valuable, not only to farmers in particular, but administrators as well. To those farmers taking up this work the benefits will soon be manifest by showing the economic status of the farm, and serving to stimulate greater interest in better management, whilst the data made available in compiled form to this Department should prove a valuable basis in fostering the welfare of farmers generally.

CONSUMPTION PER CAPITA.

During the past year an effort was made to secure data relating to the *per capita* food consumption in this Province. Returns including some 500 persons of all ages were obtained

and compiled, and results are very interesting. This work was conducted as an experiment, but results warrant further effort on a more comprehensive plan to include city as well as rural consumers, the latter only being considered so far. Results are intended for the purpose of determining total food requirements of this Province, as well as surplus supply. While there are data relating to other countries, these do not necessarily apply to this Province, and it was therefore considered advisable to establish our own basis.

OFFICE-WORK.

Owing to the method of collecting statistics by mail in 1917, the time of your Statistician was necessarily largely spent in the office compiling returns and issuing reports. The editing of the annual report of the Department was also undertaken.

STATISTICS RELATING TO AGRICULTURAL PRODUCTION, YEAR 1917—PRELIMINARY ESTIMATE.

While the following summary is merely intended as a preliminary estimate of production during the current year, since returns are yet incomplete, it nevertheless will serve as an indication when compared with that of 1916.

Figures relating to live stock, meats, poultry, and dairy products may be accepted as approximately correct, but those of fruits, fodders, and grains are subject to more or less revision, pending more complete returns. Vegetables for the time being are not considered.

Owing to unfavourable crop-growing conditions and the fact that the year's postal census of live stock revealed that our previous estimates were over-optimistic, it was not anticipated that there would be any material increase shown in the total value of the 1917 production. Notwithstanding decreased production in live stock, mutton marketed, poultry and eggs, fodders, grains and hops, prices of these and all other products which obtained throughout the year were sufficiently high to more than offset this effect.

The total value of all products except vegetables, when compared with the value of the same products in 1916, shows an increase in the current year of approximately $2,125,000, or nearly 7 per cent. The increase in the total value of all products in 1916 over 1915 was 3.39 per cent. While it is desirable not to set down a definite figure of the total value this year, in the absence of returns relating to vegetables, yet it is reasonable to expect that this figure will approach the $34,000,000 mark, as against $32,182,915 in 1916.

Live Stock.—With the exception of those of dairy cattle, prices have averaged 10.7 per cent. for horses, 14 per cent. for beef cattle, 15 per cent. for sheep, and 10 per cent. for swine, higher than 1916. The total value of the year's production of live stock is estimated to be $8,632,137, or 0.8 per cent. less than 1916.

Meats.—The quantity of British Columbia beef marketed in 1917 was 10 per cent. greater than 1916, and that of pork 34.5 per cent. greater. Mutton shows a reduction of 5 per cent. The total value of all meats marketed is estimated as 26.2 per cent. greater.

Poultry and Eggs.—These both show a production during the year of 10 per cent. less than 1916, but 2.7 per cent. greater in value.

Dairy Products.—Production in quantities is estimated to be about the same as in the previous year, but in value 15.7 per cent. greater.

Fruits.—Whilst conditions were unfavourable to normal maturity in size, particularly of apples, thus reducing total production from early estimates, yet it is estimated that the total quantity of all fruits was about 5 per cent. greater than 1916. Reports from the Okanagan District show marked increases in shipments. Prices throughout the Province have averaged about 18 per cent. more than 1916.

Potatoes.—In showing an increased production in this crop, it is necessary to point out that only commercial areas were included in the 1916 estimate, whilst in 1917 city-garden and other small plots were included, thus showing the total to be 18.2 per cent. greater in quantity than the previous year, and 7.7 per cent. greater in value.

Fodders.—These crops show increases in both quantity and value, being 6.7 and 16.8 per cent. respectively.

Grains.—These important crops probably suffered most from unfavourable growing conditions, the spring being backward and drought during the period of maturity being excessive. Total quantities were reduced 20.2 per cent. below the previous year. Prices were such, however, that the total value is estimated to be only 3.4 per cent. below 1916. It is interesting to note

that the quantity of grains produced (in terms of bushels) in this Province in 1917 shows a decrease of over 45 per cent. since 1915.

Honey.—Reports at hand indicate that the crop of honey will be 33.3 per cent. more than 1916, and values 40.4 per cent. greater.

Hops.—The greater relative reduction occurring in any one crop was in hops, this being 76.2 per cent. below 1916. This was due to the removal of a large percentage of the area. The total value was 48.3 per cent. less.

Respectfully submitted.

A. B. TWEDDLE,
Statistician.

ANNUAL REPORT OF FOUL-BROOD INSPECTOR, LOWER MAINLAND AND VANCOUVER ISLAND.

F. D. TODD.

Wm. E. Scott, Esq.,
Deputy Minister, Department of Agriculture, Victoria, B.C.

SIR,—I beg to submit my annual report on the work conducted in the above districts during the year 1917.

SEASON.

Owing to wretched weather it was not until April 18th that your Inspector was able to start on his seventh season's service as a Bee Inspector for the Province. On arriving in Vancouver and getting into work in the field, it was very soon learned, as was expected, that the winter had been a very trying one, and that about 40 per cent. of the colonies in the district had died during the winter. In most winters in British Columbia, bees do well without any protection, the result being that the majority of bee-keepers are willing to take a chance, with direful results as a consequence in the severe ones. However, the beginners in bee-culture as a whole are now handling their bees on the principle of safety first.

ACTIVITIES.

Until the end of June activities were confined chiefly to the region extending from New Westminster to the mouth of the Fraser River, in which there are about 450 bee-keepers. Early in July a series of demonstration meetings was started along the north bank of the Fraser, then up the west coast, across to Comox, and southward on Vancouver Island to Nanaimo. In the first week of August lectures were given on bees and demonstrations to the school teachers in the summer school at Victoria. The rest of the month demonstrations were given between Chilliwack and Vancouver, on the south bank of the Fraser.

DISEASE.

In the beginning of September a new outbreak of American foul-brood was discovered in the River Road district of Burnaby, traceable to a hive brought from South Vancouver in 1912 or 1913. About the same time there appeared the first case of European foul-brood in the Lower Fraser region. This outbreak was probably due to the affected honey attached to the woodwork of a honey section from Idaho, on which the bee-keeper found his bees busy early in the season. The user, after cutting out the honey, had flung the woodwork out-of-doors. As far as could be judged, this was an illustration of the way in which practically all our outbreaks of foul-brood originate. British Columbia in 1917 has become practically self-supporting so far as extracted honey is concerned; in another year she will probably be entirely so, after which the chance of new infection will be confined to imported section-honey. As the demand for section-honey is rapidly lessening every year, the present prospect is that bee-keepers will soon confine themselves to the production of extracted honey, thereby minimizing the chance of the introduction of foul-brood to our Province.

Your Inspector is glad to report that the outbreak of foul-brood discovered in his district in 1914 is now well in hand. Five municipalities—Vancouver, Point Grey, Coquitlam, Chilliwack, and Nanaimo—in which it had a footing are apparently clear. It still lingers a little in South Vancouver, and has appeared in Burnaby.

CROP.

In 1917 the honey-crop in your Inspector's districts was by far the largest in its history. Once acquainted with apicultural conditions in the Province, an endeavour was made in 1913 to estimate our crop in 1910, the year before the Bee Inspectors began this work. Twenty tons was the highest total which could be arrived at. The 1917 crop is indicated to be 160 tons, an increase of 700 per cent. in seven years. The Coast region apparently produced 120 tons.

The outlook for 1918 is very encouraging. The winter stores are excellent, the hives are filled with young bees, and the Province has a fine band of enthusiastic new bee-keepers whose heart is in their work, so with a favourable season it would not be surprising if the crop of 1918 nearly doubled that of 1917. With sugar conditions as they are, this result is devoutly to be wished for.

Respectfully submitted.

F. DUNDAS TODD,
Foul-brood Inspector.

ANNUAL REPORT OF FOUL-BROOD INSPECTOR, OKANAGAN AND THOMPSON RIVER DISTRICTS.

L. HARRIS.

W. E. Scott, Esq.,
Deputy Minister, Department of Agriculture, Victoria, B.C.

SIR,—I have the honour to submit my annual report of bee-inspection work in the Okanagan and Thompson River Districts for the year 1917.

The season was the most backward experienced during the ten years your Inspector has lived in the Okanagan District.

SEASON.

The result of the late, cold, and backward spring had a very injurious effect on the bees generally, in that they were unable to breed as early and continuously as in an average season. As a consequence, a great many colonies that survived the actual winter dwindled away from lack of young bees to take the place of the old ones that died, the result being that the losses for the winter of 1916-17 were above the average, being about 45 per cent. In a few cases where the owners took the precaution to re-queen in late summer, the results were very different and most satisfactory.

Following the late spring, and the bees generally in a backward condition, they were not ready to take advantage of the honey-flow season, which both came and ended suddenly, including not more than ten days as far as storing surplus goes, the result being that in this district the honey-crop was not an average one.

In the Thompson and Fraser River Districts better conditions prevailed, and in some cases quite a satisfactory crop was secured.

FOUL-BROOD.

There appears to be a distinct improvement in the foul-brood situation, eight colonies only having been found diseased throughout the district.

EXHIBITS.

Several displays of honey and bee products were staged at the different fall fairs, which proved an agreeable attraction, especially at the Vancouver Exhibition, where the bee-keepers of the Province met together in competition for valuable prizes.

ORGANIZATION.

On Friday during the exhibition week the bee-keepers met in convention, and the different problems of the bee-keeper were freely discussed. It was thought desirable that the whole of the Province should form itself into one organization, with central headquarters at Vancouver.

It was proposed to divide the Province into four districts, as follows: No. 1, Vancouver Island; No. 2, Coast; No. 3, Okanagan; No. 4, Kootenay; with an executive for each district. This body was to consist of one delegate for every ten members, and to be elected by the members

of each district; each district to be entitled to send two delegates to the central organization, to represent their respective district for general and special business. How this will work remains to be seen.

Respectfully submitted.

L. HARRIS,
Foul-brood Inspector.

ANNUAL REPORT OF FOUL-BROOD INSPECTOR, KOOTENAY AND BOUNDARY DISTRICTS.

W. J. SHEPPARD.

Wm. E. Scott, Esq.,
Deputy Minister, Department of Agriculture, Victoria, B.C.

SIR,—I beg to submit my annual report on the above work for 1917.

CROP.

The past season, although not quite equal to that of 1916, was a successful one for the bee-keepers in this territory, there having been a good yield of excellent honey, quite up to the usual standard. The exceptionally dry summer had the effect of considerably curtailing the period of honey-gathering by the bees, as, owing to the prolonged drought, the clovers and other nectar-secreting flowers did not remain in bloom as long as usual.

WINTER LOSS.

The losses during the winter of 1916-17 here averaged about 25 per cent., and in many instances were caused by honey-dew stored by the bees in the brood-combs during the preceding fall. In 1917 honey-dew seems to have been almost entirely absent. The bee-keepers have not worried much over their winter losses, as they have been able to ship in bees in 2-lb. packages from California at a cost delivered of about $4 per lot. These little colonies have done remarkably well, 100 lb. and upwards of honey having been secured from many of them, thus paying for their cost several times over.

DEMONSTRATIONS.

Your Inspector gave demonstrations in bee-keeping to the following Women's Institutes, in accordance with your directions: Willow Point, Greenwood, Creston, Nakusp, Arrow Park, Crawford Bay, and Rock Creek, and also to the Robson Farmers' and Junior Farmers' Institutes. Nearly all these meetings were well attended and much interest was shown by those present.

Demonstrations were given at apiaries visited in the use and construction of a simple form of hive-case which appears to be well adapted for both summer and winter conditions in this territory. Its use will no doubt tend to reduce winter losses and help to keep swarming in check, thus increasing the honey yield.

EXPERIMENTS.

Experiments have been carried out in your Inspector's personal apiary in Nelson in new methods for swarm-control, the production of sections, etc., the results of which promise to be of value to the bee-keepers in this territory.

BEES IN ORCHARDS.

The fruit-growers are realizing the importance of keeping bees in their orchards. The short fruit-crop this past season has been attributed by many to the almost total absence of wild bees and other pollinating insects during the blooming period, caused no doubt by the late cold spring, which is generally fatal to wild-insect life.

HONEY SOURCES.

White clover continues to spread in this territory, especially where cattle are allowed to range, and farmers are growing more alsike. Some of the bee-keepers who have land available are trying sweet clover (*Melilotus alba*), which not only yields honey in quantity, but has been found to be a good forage-plant that will withstand drought and improve the soil. One or two are also experimenting with sainfoin, which is a good honey-plant.

FOUL-BROOD.

Foul-brood was found in two apiaries—viz., at Kaslo and Nelson—and the colonies affected were destroyed.

Respectfully submitted.

W. J. SHEPPARD,
Foul-brood Inspector.

ANNUAL REPORT OF SECRETARY, ADVISORY BOARD OF WOMEN'S INSTITUTES.

MRS. M. S. DAVIES.

Wm. E. Scott, Esq.,
Superintendent of Institutes, Department of Agriculture, Victoria, B.C.

SIR,—I have the honour to submit herewith my report on the work of the Women's Institutes for the year 1917.

During the year one institute was organized at Okanagan Centre and Woods Lake, Okanagan Valley, making a total of fifty-nine institutes now in active work, with a membership of nearly 3,000.

The membership reported for 1917 is a little less than in 1916. In many sections members have moved away, and others have become absorbed in patriotic societies.

FLOWER-SHOWS.

These have been held by thirty-nine institutes. The prize-lists were comprehensive, in many cases including early vegetables. The quality of exhibits was excellent. Many institutes have a department for needlework and one for cooking. More attention should be given towards interesting children in gardening and taking part in these exhibitions.

The Department assisted each show with a *per capita* grant of 25 cents and five book prizes.

PROGRAMMES.

Forty-five institutes carefully prepared their yearly programmes, the majority having these printed for distribution, while others economized—having typewritten or written copies for members. The topics show a wider range of study than formerly.

CONFERENCES.

During the year conferences were held in the four institute districts, as follows: Okanagan, at Vernon, September 18th to 20th; Kootenay, at Cranbrook, September 25th to 27th; Vancouver Island, at Duncan, October 3rd to 5th; Lower Mainland, at Mission City, October 11th and 12th.

The delegates greatly appreciated the presence of our Superintendent of Institutes at the first three of these conferences. Professor Davidson, of the University of British Columbia, gave splendid addresses on "The Wild Flowers of British Columbia," and Mrs. Chalmers gave helpful talks on "Food Conservation"; these two speakers illustrated their lectures with lantern-slides.

At the two Coast conferences Dr. Young, Secretary of the Provincial Board of Health, added much to the general help given by his address on "Public Health."

The earnest discussion on every paper showed the interest taken by the women in all matters dealt with. A large number of resolutions were brought up, many of which were adopted and forwarded to the different departments for consideration.

LECTURES.

During the winter of 1916 and spring of 1917, Mrs. J. S. Chalmers, of Thrums, visited each of the institutes, giving a two-day course of lectures on vegetable-gardening; live stock on the farm; values of silos; home canning, etc. Judging from enthusiastic reports from the institutes, these lectures were very helpful and much appreciated.

SCHOOL-WORK.

Fifteen of the institutes have School Committees. These committees, by permission of the trustees, visit schools regularly and co-operate with teachers toward improving sanitary and

other conditions of local schools. This helps to bring teachers, trustees, and parents into helpful relationship. The matter of Parent-Teacher Associations was discussed at two of the conferences. Reports show that twenty-one Women's Institute members are working on School Boards. The Kalamalka Women's Institute instituted a Scholarship Fund to assist some student each year who, if successful in the entrance examinations, wishes to prepare for college. The scholarship of $100 was won this year by Miss Winnifred Brown, of Oyama.

BOYS' AND GIRLS' CLUBS.

These have not been generally formed, only sixteen being reported from three Women's Institute districts. Only one Poultry Club has been reported.

PATRIOTIC WORK.

This has been the principal work undertaken in 1917. The institutes raised the splendid sum of $16,824.07 for this purpose, as reported for the conference year. Many have been the special calls upon Women's Institute funds for needed help, and none have been refused.

Military hospitals have been assisted; the Agricultural Relief of the Allies Fund has been generously helped; the Military Y.M.C.A. has perhaps received the greatest contributions, with the exception of the Red Cross, to which $6,490.39 was given, and $2,371.19 to Y.M.C.A.

Among articles made and sent overseas the following have been reported: 6,404 pairs of socks; 2,560 suits of pyjamas; 1,977 shirts; or a total of over 21,000 articles from the institutes.

PUBLICATIONS.

Only two numbers of the "Quarterly Bulletin" were published in 1917, the cost proving greater than expected. A number of pages are given each month to Women's Institute work in the *Agricultural Journal*, thus making Women's Institute news up-to-date, and also making it possible for a greater number of other helpful papers being printed.

ADVISORY BOARD.

Owing to the retirement of Miss Ravenhill in January, another member had to be appointed to represent the Island institutes, and Mrs. Blackwood-Wileman, of Duncan, took her place. The resignations of Mrs. Lipsett, of the Okanagan institutes, and Mrs. Davies, of the Lower Mainland institutes, to take place at the close of the year, was laid before the Superintendent of Institutes in the early fall.

The following statement relating to Women's Institutes for the conference year may be noted:—

	Kootenay.	Okanagan.	Vancouver Island.	Lower Mainland.
Membership	669	908	524	804
Junior members	34	11	15	10
Flower-shows	9	11	8	11
Total receipts	$4,890.34	$5,395.15	$3,951.10	$4,389.52
For patriotic purposes	4,069.67	4,462.67	4,239.22	4,052.32
Red Cross	1,159.56	596.10	3,494.89	1,239.84
Prisoners of war	315.68	648.70	363.62	619.20
Y.M.C.A.	159.95	1,914.62	129.90	176.65

The institute-work has steadily grown in interest and efficiency. The members expect by the study of Canadian civics, that many are planning to take up during the coming year, to fit themselves for greater efficiency. Another feature of recent date is the food-conservation pledge cards, and the distribution of these, also the study of food-conservation problems, promises earnest work and planning.

Respectfully submitted.

MRS. M. S. DAVIES,
Secretary, Advisory Board.

APPENDICES.

APPENDIX No. 1.

PRUNING-SCHOOLS, 1917.

No.	Place.	Instructor.	Dates.	Pupils.		No. of Lessons.	Instructors.		Total Expenses.	Fees received.	Net Expenditure.
				No.	Av. Prof.		Salary.	Expenses.			
			1916.		Per Cent.						
1	Summerland	Ben Hoy	Dec. 18-23	7	68.0	10	$ 26.45	$ 16.75	$ 43.20	$ 7.00	$ 36.20
			1917.								
2	Westbank	Ben Hoy	Feb. 20-24	7	68.0	8	24.40	12.25	36.65	7.00	29.65
3	Kelowna	M. H. Chesbro	Feb. 8-16	9	85.5	10	32.10	Nil	32.10	9.00	23.10
4	Naramata	M. H. Chesbro	Jan. 23-26	9	82.0	9	14.30	17.75	32.05	9.00	23.05
5	Nanaimo	H. Thorber ...	Jan. 29-30 / Feb. 26-28	9	72.5	10	23.50	30.55	54.05	9.00	45.05
6	Metchosin	E. W. White ..	Feb. 26- / March 2	8	74.0	10	18.00	15.50	33.50	8.00	25.50
7	Rocky Point	E. W. White ..	Feb. 19-21 / March 5-7	8	79.0	10	21.50	22.50	44.00	8.00	36.00
8	Mission City	H. Thorber ...	March 5-8	5	70.0	8	17.60	16.45	34.05	8.00	26.05
9	Duncan	H. Thorber ...	Feb. 19-20 / March 12-13	6	67.5	7	17.60	19.95	37.55	8.00	29.55
10	Okanagan Centre	M. H. Chesbro	March 12-16	10	82.0	9	16.10	7.10	23.20	10.00	13.20
11	Vernon	P. E. French ..	March 6-10	6 (Adults)	S., 82.5; A., 80.0	10	22.05	6.00	28.05	5.00*	23.05
12	New Denver	E. C. Hunt ...	March 27-31	9	89.0	9	22.05	25.20	47.25	9.00	38.25
				93	76.5	110	$255.65	$190.00	$445.65	$97.00	$348.65

* One not paid.

APPENDIX No. 2.

PACKING-SCHOOLS, 1917.

No.	Place.	Guarantor.	Dates.	Instructor.	No. of Lessons.	Pupils. No.	Pupils. Average Proficiency.	Sale of Fruit.	Fees received.	Total Expenses.	Total Receipts.	Net Expenses.
							Per Cent.					
1	Duncan	High School	Jan. 22-27	F. E. Loveday	5	18	85.0					
2	"	Junior 4th	" 22-27	"	5	17	79.0	....	....	$ 86 65	....	$ 86 65
3	"	Class A, Div. 1	" 22-27	"	5	17	80.0					
4	Keatings	F. G. Gold	" 29-31	"	6	8	83.0	....	$ 8 00	37 50	$ 8 00	29 50
5	Okanagan Centre	P. W. Pixton	Feb. 5-10	"	12	20	84.0	....	40 00	116 23	40 00	76 23
6	Naramata	T. H. Rayner	" 12-14	"	8	14	84.5	....	14 00	45 05	14 00	31 05
7	Kaleden	F. W. King	" 15-17	"	8	9	85.0	....	9 00	41 00	9 00	32 00
8	West Summerland	Jno. Tait	" 19-24	"	11	21	86.0	....	42 00	97 15	42 00	55 15
9	Keremeos	L. O. Keeler	Feb. 26-March 3	"	10	17	87.0					
10	"	School pupils	" 27- " 3	"	5	11	83.0	$5 00	34 00	103 85	39 00	64 85
11	Salmon Arm	E. Doberer	March 19-24	"	12	12	84.5					
12	"	High School	" 12-17	"	6	15	83.0					
13	"	Public School (senior)	" 12-17	"	6	16	83.0	....	24 00	153 85	24 00	129 85
14	"	" (junior)	" 12-17	"	6	16	81.0					
15	Vernon	J. B. Brown (night-school)	Jan. 22-27	J. B. Castner	6	17	95.0	....	17 00	105 16	17 00	72 16
16	"	" (day-school)	" 22-27	"	12	8	95.5	....	16 00		16 00	
17	Coldstream	Rev. Mackie's School (senior)	" 29-Feb. 3	"	....	8	91.0	....	....	....	....	....
	"	" (junior)	" 29- " 3	"	....	8	84.0	....	....	....	....	....
18	Long Lake		" 29- " 3	"	12	14	92.5	....	25 00	81 85	25 00	56 85
19	Vernon	Afternoon	Feb. 5-10	"	6	16	95.0	....	16 00	39 81	16 00	5 81
20	"	Evening	" 5-10	"	6	18	95.5	....	18 00		18 00	
21	Kelowna	R. L. Dalglish	" 26-March 3	"	12	13	94.0	....	26 00	104 73	42 00	62 73
22	"	"	" 26- " 3	"	6	16	95.0	....	16 00			
23	"	Public School	March 5-10	"	....	31	80.0	....	....	112 63	....	112 63
24	"	"	" 5-10	"	....	38	79.0	....	....			
25	Peachland	W. M. Dryden	Feb. 19-24	"	12	15	94.5	....	30 00	122 70	30 00	92 70
26	"	Public School	" 19-24	"	....	20	94.0	....	....			
27	Oyama	J. Hicks	" 12-17	"	12	26	96.0	....	50 00	129 33	50 00	79 33
28	Vernon	High School (senior)	March 19-24	"	....	20	93.0					
29	"	" (junior)	" 19-24	"	....	18	89.0			119 67	....	119 67
30	"	Public School (a.m.)	" 26-31	"	....	20	86.0	....	....			
31	"	" (p.m.)	" 26-31	"	....	21	88.5					
32	Oceola	School, cancelled	" 26-31	"	....	..	....	....	....	19 55	....	19 55
33	Sorrento	C. R. Newman	April 10-13	"	6	8	90.5	5 00	8 00	72 75	13 00	59 75
34	Maple Ridge	School pupils	Jan. 29-Feb. 3	J. Sewell	10	28	88.0	....	....			
35	Haney	"	Feb. 5-10	"	12	27	81.0	....	....	184 41	18 00	166 41
36	"	M. H. Robertson	" 5-10	"	6	11	80.0	7 00	11 00			
37	Westbank	M. Russell	March 26-31	"	12	7	92.0					
38	"	"	" 26-31	"	6	5	87.0	....	19 00*	93 82	19 00	74 82
39	Central Park	B. Forsyth	Feb. 13-14-15	"	6	11	80.0	7 00	11 00	58 74	18 00	40 74
40	Harrop	W. J. McConnell	" 19-24	"	12	9	88.0					
41	"	School pupils	" 19-24	"	6	9	81.5	2 00	18 00	72 07	20 00	52 07
42	Needles	O. J. Aspinall	" 28-March 6	"	12	11	90.0	4 00	22 00	71 37	26 00	45 37
43	Mission City		March 14-17	"	12	12	86.0	7 50	23 00	120 06	30 50	89 56
44	Nakusp		" 8-14	"	6	7	80.0					
45	"	School pupils	" 8-14	"	6	18	73.0	....	7 00	100 79	7 00	93 79
46	"	"	" 9-14	"	6	15	77.0					
47	Lytton	L. Dawson	" 19-21	"	6	12	66.0	....	12 00	29 43	12 00	17 43

APPENDIX No. 2—*Concluded.*

PACKING-SCHOOLS, 1917—*Concluded.*

No.	Place.	Guarantor.	Dates.	Instructor.	No of Lessons.	Pupils.		Sale of Fruit.	Fees received.	Total Expenses.	Total Receipts.	Net Expenses.
						No.	Average Proficiency.					
48	Grand Forks	School pupils	Feb. 5-10	E. C. Hunt	12	30	76.0	6 50	....	61 18	6 50	54 68
49	"	C. C. Heaven	" 26-March 2	"	12	12	84.5	13 50	24 00	55 66	37 50	18 16
50	Creston	School pupils	" 12-18	"	12	32	75.5	10 00	11 00	88 12	21 00	67 12
51	"	J. A. Lidgate	" 12-18	"	6	11	78.0					
52	South Slocan	E. Jamieson	" 20-22	"	6	9	81.0	5 00	9 00	46 33	14 00	32 33
53	Penticton	J. F. Park	" 19-24	J. Lawler	13	13	78.0	3 00	26 00	91 25	29 00	62 25
54	West Summerland	School pupils	" 26-March 3	"	6	59	77.0	....	....	105 71	....	105 71
55	Penticton	"	March 5-10	"	6	35	79.0					
56	"	"	" 5-10	"	6	19	75.0	4 95	....	148 66	4 95	143 71
57	"	"	" 5-10	"	6	34	81.0					
58	Nelson		" 12-18	"	12	15	80.0					
59	"	High School	" 12-18	"	....	18	77.0	....	30 00	118 76	30 00	88 76
60	Willow Point		" 19-21	"	6	14	81.5	....	11 00	58 23	11 00	47 23
61	Bonnington		" 22-24	"	6	8	82.0	3 00	8 00	65 40	11 00	54 40
	Totals				....	1,037	84.5	$83 45	$635 00	$3,159 45	$718 45	$2,441 00

* Seven at $2 and five at $1.

APPENDIX No. 3.

AMOUNT OF FRUIT AND VEGETABLES RECEIVED AT VANCOUVER DURING 1917.

		British Columbia.	Imports.
Apples	boxes	115,215	62,483
Apricots	crates	1,970	6,350
Blackberries	crates	612	56
Cherries	lb.	21,000	127,660
Crab-apples	boxes	1,317	80
Currants	crates	1,400	...
Gooseberries	crates	1,600	27
Peaches	boxes	10,186	56,153
Pears	boxes	2,868	12,827
Plums and prunes	crates	14,111	12,287
Raspberries	crates	4,300	57
Strawberries	crates	13,400	8,385
Loganberries	crates	333	10
Asparagus	boxes	2,300	1,300
Lettuce	crates	1,400	3,200
Mixed vegetables	tons	4,800	410
Onions	tons	1,100	350
Peppers	boxes	26	2,228
Potatoes	tons	8,627	1,294
Rhubarb	boxes	3,915	1,527
Tomatoes	boxes	22,800	2,950
Cantaloupes	crates	5	3,700
Egg-plant	boxes	90	265
Nectarines	boxes	100	5

APPENDIX No. 4.

STOCKS OF FRUITS AND VEGETABLES ON HAND IN THE CITY OF VANCOUVER.

	1914.	1915.	1916.	1917.
Apples, B.C. boxes	5,772	16,711	21,150	34,020
Apples, U.S. boxes	865	18,170	8,400	6,700
	6,637	34,881	29,550	40,720
Potatoes, B.C. sacks	48,670	30,120	85,600	31,527
Onions, B.C. sacks	680	310	1,920	14,600

APPENDIX No. 5.

STATEMENT RELATING TO SOUTHERN OKANAGAN FRUIT AND VEGETABLE EXPERIMENT STATION.

Receipts and Expenses, Season of 1917.

Receipts.			*Expenses.*	
Vegetables—			Hired labour	$1,073 50
Plants sold	$ 67 10		Land and water taxes	88 75
Cucumbers	3,728 30		Boxes, nails, and paper	818 90
Tomatoes	161 00		Horse-feed bought	128 50
Sweet peppers	820 00		Manure and fertilizer	58 00
Egg-plant	829 80		Stationery, postage, telegraphing,	
Cantaloupe	123 35		smithy, and incidental expenses..	70 20
		$5,729 55		
Fruits—				
Red currants	$ 153 45			
Black currants	19 80			
Gooseberries	23 30			
Black raspberries	9 90			
Sweet cherries	36 00			
Plums	33 40			
Prunes	6 25			
Pears	9 25			
Apricots	249 45			
Apples (net)	924 75			$2,237 85
		$1,465 55	Balance, being profit	4,957 25
		$7,195 10		$7,195 10

APPENDIX No. 6.

CHILLIWACK COW-TESTING ASSOCIATION.

No.	Name of Cow and Breed.	Owner.	Address.	Milk.	Butter-fat.
	Two Years old.			Lb.	Lb.
1	Mabel, Gr. J.	A. E. Dumvill	Sardis	8,436	371.9
	Cherry, Gr. J.	S. W. Keith	Chilliwack	8,690	371.9
2	Bess, Gr. J.	M. Clarkson	Chilliwack	8,047	356.4
	Three Years old and over.				
1	Brindle, Gr. J.	A. E. Dumvill	Sardis	13,811	659.8
2	Fox 7, Reg. G.	C. Hawthorne	Chilliwack	15,469	647.7
3	Nancy, Gr. J.	G. T. Richards	Chilliwack	11,271	527.9

LANGLEY-SURREY COW-TESTING ASSOCIATION.

	Two Years old.				
1	Dinah, Gr. Ayr	Shannon Bros.	Cloverdale	11,048	398.2
2	Fortune, Gr. Ayr	Shannon Bros.	Cloverdale	9,465	341.4
3	White, Gr. S.	Haggerty Bros.	Murrayville	7,451	310.9
	Three Years old and over.				
1	Lily, Gr. H.	Alex. Hastie	Clayburn	10,767	563.3
2	No. 8, Gr. H.	L. H. Delesalle	Matsqui	15,415	519.9
3	Ruby, Gr. J.	B. A. Harrison	Langley	9,909	478.0

DELTA COW-TESTING ASSOCIATION.

	Two Years old.				
1	Belle, Gr. H.	Alex. Davie	Ladner	10,199	373.9
2	Perfection, Gr. H.	Alex. Davie	Ladner	10,312	359.9
3	Blanch, Gr. H.	Alex. Davie	Ladner	10,326	324.9
	Three Years old and over.				
1	Lady Bountiful, Gr. S.	A. D. Paterson	Ladner	13,027	515.4
2	Dairy Maid, Gr. H.	E. B. Nobles	Ladner	13,992	515.1
3	Cherry, Gr. J.	E. B. Ladner	Ladner	9,814	474.4

COMOX VALLEY COW-TESTING ASSOCIATION.

	Two Years old.				
1	Nancy, Gr. Ayr	G. O. Game	Comox	8,694	370.9
2	Annie, Gr. J.	H. Gurney	Sandwick	4,940	293.7
3	Tiny, Gr. J.	H. Gurney	Sandwick	5,912	287.0
	Three Years old and over.				
1	Boss, Gr. J.	W. T. Wain & Son	Courtenay	10,378	447.3
2	Rose, Gr. J.	W. T. Wain & Son	Courtenay	10,023	444.5
3	Tiny, Gr. J.	R. U. Hurford	Courtenay	8,401	435.6

APPENDIX No. 7.

SHOWING RECORDS OF INDIVIDUAL COWS, BRITISH COLUMBIA.

Madam Posch Pauline, No. 10291, C.H.F.H.B.

	Age.			Milk.	Butter-fat.	Butter, 80% Fat.
	Y.	M.	D.	Lb.	Lb.	Lb.
7-day record	8	5	9	835.6	27.42	34.28
30-day record	8	5	9	3,386.6	109.20	136.50
60-day record	8	5	9	6,490.5	209.88	262.36
90-day record	8	5	9	9,464.9	305.51	381.92
120-day record	8	5	9	12,233.1	396.25	495.31
240-day record	8	5	9	21,054.5	686.70	858.39
365-day record	8	5	9	27,597.4	898.77	1,123.53

NOTE.—This record was finished about August 1st, 1917, and up to that time is the largest *official* milk record yet reported in Canada, and the second largest butter record.

Zarilda Clothilde 3rd De Kol, No. 14887, C.H.F.H.B.

	Age.			Milk.	Butter-fat.	Butter, 80% Fat.
	Y.	M.	D.	Lb.	Lb.	Lb.
7-day record	6	10	12	831.3	24.89	31.12
30-day record	6	10	12	3,331.7	97.79	122.25
60-day record	6	10	12	6,718.0	187.16	233.96
90-day record	6	10	12	9,940.5	270.88	338.62
120-day record	6	10	12	13,009.8	353.81	422.28
240-day record	6	10	12	23,260.0	644.87	806.11
365-day record	6	10	12	30,467.3	857.30	1,071.60

NOTE.—This record was finished in November, 1917, and thus establishes a new strictly official world's record for milk production. The Canadian record for butter-fat production is still held by the British Columbia cow "Lady Pietje Canary's Jewel," No. 17314.

APPENDIX No. 8.

LIST OF CREAMERIES IN BRITISH COLUMBIA.

Name.	Secretary or Manager.	P.O. Address.
Burns, P., & Co., Ltd.	M. R. Silver	Woodland Drive, Vancouver.
Chilliwack Creamery Association, Ltd.	W. K. MacLeod	Chilliwack.
Comox Creamery Association, Ltd.	R. U. Hurford	Courtenay.
Cowichan Creamery Association, Ltd.	W. Paterson	Duncan.
Cranbrook Butter Co., Ltd.	H. A. Ammerman	Cranbrook.
Curlew Creamery Co.	Ira Carter	Grand Forks.
Heffley Creamery	T. Bunting	Heffley Creek.
Kamloops District Creamery Association	J. A. Magar	Kamloops.
Kelowna Creamery Co., Ltd.	W. G. Benson	Kelowna.
Meadowbrook Creamery Co.	A. P. Slade	199 Water Street, Vancouver.
Nanaimo Creamery Association, Ltd.	Jos. Randle	Nanaimo.
Curlew Creamery Co., Ltd.	I. Carter	Nelson.
New Westminster Creamery Co., Ltd.	D. E. Mackenzie	New Westminster.
Northwestern Creamery, Ltd.	Norton & Snelling	Victoria.
Northern Okanagan Creamery Association, Ltd.	A. E. Sage	Armstrong.
Oxford Dairy Co., Ltd.	J. Burmeister	New Westminster.
Revelstoke Creamery Co., Ltd.	H. McKinnon	Revelstoke.
Fraser Valley Milk Producers' Association	E. G. Sherwood	1327 Standard Bank Building, Vancouver.
Royal Dairy Co.	C. W. McAllister	Douglas Street, Victoria.
Royal Dairy Co.	A. A. Young	1001 Pender Street West, Vancouver.
Saltspring Island Creamery Association, Ltd.	F. L. Wheeler	Ganges Harbour, Saltspring Island.
Salmon Arm Creamery Association, Ltd.	R. Karnagel	Salmon Arm.
Spencer, David, Ltd.	W. S. Smith	Cordova Street West, Vancouver.
Standard Milk Co., Ltd.	E. W. Clark	405 Eighth Avenue West, Vancouver.
Turner's Dairy, Ltd.	F. Turner	Seventeenth Avenue and Ontario Street, Vancouver.
Vancouver Creamery Co., Ltd.	J. M. Livingstone	15 Alexander Street, Vancouver.
Clayburn Creamery	H. Hanson	Clayburn.
Condenseries.		
B.C. Milk Condensing Co., Ltd.	L. Chevalley	Sardis.
Courtenay Milk Condensing Co., Ltd.	E. G. Emery	Courtenay.
Pacific Milk Products Co.	Bert W. Keatings	Ladner.

APPENDIX No. 9.

SUMMARY OF CREAMERY REPORT, 1917.

Number of creameries	27
Number of patrons	1,550
Number of visits to creameries	49
Number of creameries using pasteurizer	5
Average per cent. of fat in cream	27-30
Average per cent. of moisture in butter	15
Average amount of salt per pound of butter	5/8 oz.
Number of creameries using Babcock test	27
Number of creameries using cream-scales (metric)	26
Number of creameries testing each delivery of cream separately	10
Number of creameries using composite samples	17
Number of creameries having mechanical refrigeration	12
Average temperature of storages	45° Fahr.
Number of creameries having poor water-supply	2
Number of creameries having poor system of sewage-disposal	1
Expenditure, new creameries and general improvements	$16,700

APPENDIX No. 10.

WRITTEN EXAMINATION FOR TESTER'S LICENCE, "DAIRIES REGULATION ACT."

1. Give briefly directions for testing milk with a Babcock tester	15
2. What are the various uses of the Babcock test?	10
3. Upon what principle is the Babcock test founded? Explain briefly	10
4. How much milk by weight is supposed to be placed in the Babcock test-bottle, and why do we use a 17.6-c.c. pipette for that purpose?	10
5. Name four important requirements for accurate testing of milk and cream	5
6. What are the principal points to be considered in taking and keeping samples for composite tests?	10
7. (*a.*) Upon what factors is the quantity of preservative used in composite tests dependent?	5
(*b.*) In case of trouble with mould growing on the walls of composite test-bottles, give remedy	5
8. (*a.*) When the milk sample is sour and contains lumps of curd, how should it be treated before testing?	5
(*b.*) How should composite samples of milk and cream be prepared for the test?	5
9. (*a.*) Explain briefly why cream for testing should be weighed into the test-bottle rather than measured by pipette	5
(*b.*) What precaution should be observed in the weighing of the cream?	5
(*c.*) What is the correct weight for testing cream?	5
10. (*a.*) What action has sulphuric acid on milk?	5
(*b.*) At what specific gravity and how much acid should be used?	5
(*c.*) At what temperature should milk and acid be before mixing?	5
11. (*a.*) What is the required speed in revolutions per minute of a tester whose diameter is 18 inches?	5
(*b.*) How is the speed of a turbine tester ascertained?	5
12. (*a.*) What is the proper temperature of the water to be added to the test-bottles while making the test?	5
(*b.*) How many minutes should the bottle be whirled in the tester?	5
13. Draw diagrams of how the test should be read:—	
First, for milk	5
Second, for cream	5
14. If foam appears on the surface of the fat column, what is it caused by? What remedy should be applied?	5
15. (*a.*) What are the causes of dark-coloured or burnt readings?	5
(*b.*) What are the causes of light-coloured or cloudy readings?	5
16. At what temperature should the test be read, and how is this temperature best regulated?	5
17. Find the correct average test of:— Cow No. 1, 340 lb. milk, testing 4.3 per cent. Cow No. 2, 460 lb. milk, testing 4.0 per cent. Cow No. 3, 760 lb. milk, testing 3.0 per cent. Cow No. 4, 620 lb. milk, testing 3.5 per cent.	10
18. What is the composition of average, normal milk?	10
Total	180

APPENDIX No. 11

SIXTH INTERNATIONAL EGG-LAYING CONTEST, VICTORIA, B.C.

Class 1.—Light-weight Varieties (Six Birds to a Pen).

Pen.	Name and Address.	Breed.	Total Eggs.
1	J. O. M. Thackeray, Chilliwack (winner of first prize, $100)	White Leghorns ...	1,193
16	H. Dryden, Corvallis, Oregon (winner of second prize, $50) ..	White Leghorns ...	1,064
10	G. O. Pooley, R.R. 1, Duncan (winner of third prize, $25) ...	White Leghorns ...	1,061
8	Graves & McCulloch, Saturna Island (winner of fourth prize, $10)	White Leghorns ...	1,046
21	P. D. Hillis, Rocky Point (winner of fifth prize, *Canadian Poultry Review* bronze medal)	White Leghorns ...	1,027
4	Norie Bros., Cowichan (winner of sixth prize, bronze medal, given by H. D. Reid)	White Leghorns ...	1,016
17	J. L. Smith, Shawnigan Lake	Buttercups	993
6	W. McEwan, R.M.D. 1, Duncan	White Leghorns ...	990
9	Mr. and Mrs. R. W. Chalmers, Thrums	White Leghorns ...	971
7	W. Bradley, Maywood	White Leghorns ...	969
15	M. H. Ruttledge, R.R. 2, Sardis	White Leghorns ...	968
11	Madrona Farms, R.R. 4, Victoria	White Leghorns ...	945
12	F. E. Pullen, Whonnock	Anconas	927
2	D. Edwards, Somenos	White Leghorns ...	916
20	F. Hoey, R.M.D. 1, Duncan	White Leghorns ...	910
18	L. M. Ross, Cowichan	White Leghorns ...	904
13	H. A. Hincks, Langford Station	White Leghorns ...	879
3	A. V. Lang, R.R. 3, Victoria	White Leghorns ...	873
14	C. G. Golding, Qualicum	White Leghorns ...	801
5	Mrs. F. C. Kenward, Invermere	White Leghorns ...	791
19	H. Colbourn, Forty-ninth Avenue W., Vancouver	Black Minorcas ...	701
	Total	....	19,944

Class 2.—Heavy Weights (Six Birds to a Pen).

37	Messrs. Dean Bros., Keatings (winner of first prize, $100) ...	White Wyandottes..	1,188
34	E. D. Read, Duncan (winner of second prize, $50)	White Wyandottes..	1,174
39	F. W. Frederick, Phoenix (winner of third prize, $25)	R.I. Whites	1,095
27	G. D. Adams, Box 840, Victoria (winner of fourth prize, $10)	White Wyandottes..	1,087
25	V. T. Price, Dublin, Ireland (winner of fifth prize, *Canadian Poultry Review* bronze medal)	S.C. Reds	1,069
33	P. S. Lampman, York Place, Oak Bay (winner of sixth prize, bronze medal, given by H. D. Reid)	S.C. Reds	1,030
35	S. S. F. Blackman, R.M.D., Sidney	S.C. Reds	1,012
28	Norfolk Farms, St. Williams, Ont.	Barred Rocks	995
30	F. G. Barr, Colquitz	White Wyandottes..	988
36	A. W. Cooke, Kelowna	Buff Orpingtons ...	974
22	W. H. Mahon, Duncan	White Wyandottes..	969
38	Regan Bros., Seventy-eighth Avenue, Edmonton, Alta.	Buff Orpingtons ...	948
24	W. H. Catterall, Mount Tolmie	White Wyandottes..	922
26	J. P. Wood, R.R. 1, Cowichan Bay	S.C. Reds	919
29	R. N. Clerke, Vernon	R.C. Reds	883
23	W. H. Willins, Stannard Avenue, Victoria	R.C. Reds	874
40	D. Gibbard, Mission	Barred Rocks	798
32	A. L. Lowe, Lake Hill P.O.	S.C. Reds	766
31	J. P. Bloore, Chilliwack	White Wyandottes..	725
	Total	....	18,416

Special-prize winners: Best winter-egg yield, Class 1, J. Thackeray, Chilliwack; Class 2, G. Adams, Victoria; both winners of silver medals donated by J. Idiens & Son, Victoria.

Winners of *Poultry, Pigeons, and Pet Stock Journal* silver medals to pens laying most eggs during three concluding months: Class 1, Pen 10; Class 2, Pen 34.

APPENDIX No. 11a.

SUMMARY OF RESULTS, SIXTH INTERNATIONAL EGG-LAYING CONTEST, VICTORIA, B.C.

Duration of contest (months)	12
Number of pens	40
Number of birds	240
Number of eggs laid	38,360
Value of eggs laid	$1,310.63
Average monthly revenue	$109.21
Cost of feeding	$611.05
Average monthly feed cost	$50.92
Profit over cost of feeding	$699.58
Average price of eggs per dozen	.41
Highest price received per dozen (October 9th)	.60
Lowest price received per dozen (March 12th)	.30
Average cost to produce dozen eggs	.19.1
Average number of eggs laid per pen	959
Average number of eggs laid per bird	159.8
Average cost of food per pen (six birds)	$15.27
Average cost of food per bird	$2.54
Profit over cost of feed per pen	$17.48
Profit over cost of feed per bird	$2.91
Eggs laid by winning pen, Class 1	1,193
Average per bird winning pen, Class 1	198.8
Eggs laid by winning pen, Class 2	1,183
Average per bird winning pen, Class 2	198

COMPARISON BETWEEN FOURTH CONTEST (12 MONTHS), 1914-15, AND SIXTH (12 MONTHS), 1916-17 (240 BIRDS IN EACH CONTEST).

	Fourth Contest.	Sixth Contest.
Number of eggs laid	39,757	38,360
Cost of feed	$527.38	$611.05
Profit over cost of feed	$549.37	$699.58
Average price of eggs	.32.5	.41
Cost to produce dozen eggs	15.9	19.1

APPENDIX No. 12.

POULTRY ASSOCIATIONS IN BRITISH COLUMBIA, 1917.

Association.	Delegates.	Address.
Arrow Lakes	T. Sellers	Nakusp.
Ashcroft	G. H. T. Edwards	Walhachin.
Central Park	J. A. Thurston	Central Park.
Chilliwack	A. H. Turvey	Chilliwack.
Cobble Hill	Mrs. McMillan	Cobble Hill.
Cowichan	L. F. Solly	Westholme.
Cranbrook	E. T. Cooper	Cranbrook.
Fernie	R. Jones	West Fernie.
Golden	L. F. Mitchell	Golden.
Grand Forks	T. Bowen	Grand Forks.
Greenwood	....	....
Kamloops	W. Brennan	Kamloops.
Kelowna	A. Notley	Kelowna.
Ladysmith	....	....
Langford	H. A. Hincks	Langford Station.
Maple Ridge	A. H. Anderson	Port Hammond.
Mission City	Rev. C. McDiarmid	Mission City.
Nanaimo	J. Isherwood	Nanaimo.
New Denver	B. Parkinson	New Denver.
Northern Okanagan	H. A. Allison	Armstrong.
North Vancouver	W. W. McGregor	230 Twenty-eighth Street, North Vancouver.
Penticton	J. F. Reason	Penticton.
Point Grey	Mrs. Barnes	Kerrisdale.
Parksville	W. Stanhope	Parksville.
Revelstoke	F. Bourne	Revelstoke.
Saltspring Island	Rev. G. Dean	Ganges Harbour.
Summerland	J. Tait	Summerland.
Trail	J. A. Wadsworth	Trail.
Vernon	H. E. Waby	Enderby.
Victoria	D. Nicol	Bank Street, Victoria.
Vancouver	R. Wilson	Vancouver.
West Kootenay	G. Horstead	Nelson.
Whonnock	....	....

APPENDIX No. 13.

FERTILIZER TESTS WITH POTATOES.

Variety.	Grade.	Manure, 20 Tons; Lime, 1½ Tons per Acre.	Lime, 1½ Tons per Acre.	Check, No Treatment.	Manure, 20 Tons per Acre.	Sodium Nitrate, 100 Lb.; Superphosphate of Lime, 300 Lb. per Acre.	Average of All Treatments.
		Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Eureka	Marketable ..	12.224	3.400	4.355	7.537	...	6.879
Eureka	Unmarketable	1.566	1.719	1.493	1.256	...	1.508
	Totals	13.790	5.119	5.848	8.793	...	8.387
Early St. George	Marketable ..	11.880	3.514	1.065	8.912	2.704	5.615
Early St. George	Unmarketable	2.827	2.101	5.325	2.735	2.577	3.113
	Totals	14.707	5.615	6.390	11.647	5.281	8.728
Carmen No. 1...	Marketable ..	11.383	2.021	2.489	10.412	2.237	5.708
Carmen No. 1...	Unmarketable	1.177	1.642	1.866	1.714	1.300	1.539
	Totals	12.560	3.663	4.355	12.126	3.537	7.247
Burbank	Marketable ..	8.590	6.238	2.613	10.390	3.820	6.330
Burbank	Unmarketable	1.254	1.536	1.742	1.795	1.566	1.579
	Totals	9.844	7.774	4.355	12.185	5.386	7.909
Early Rose	Marketable ..	7.107	.955	1.493	5.080	2.997	3.526
Early Rose	Unmarketable	3.132	3.132	2.115	1.528	1.470	2.275
	Totals	10.239	4.087	3.608	7.608	4.467	5.801
Netted Gem	Marketable ..	2.658	1.052	.933	6.455	2.101	2.639
Netted Gem	Unmarketable	.554	.287	1.478	.725	.458	.700
	Totals	3.212	1.339	2.411	7.180	2.559	3.339
Averages	Marketable ..	8.973	2.863	2.158	8.131	2.772	...
Averages	Unmarketable	1.750	1.736	2.326	1.625	1.474	...
	Totals	10.723	4.599	4.484	9.756	4.246	...

APPENDIX No. 14.

STATEMENT SHOWING AVERAGE YIELDS AND HIGHEST, LOWEST, AND AVERAGE COSTS IN CROP COMPETITIONS, 1917.

Crop.	No. of Reports.	Highest Yield per Acre.	Lowest Yield per Acre.	Average Yield per Acre.	Highest Cost per Ton in Field.	Lowest Cost per Ton on Farm.	Average Cost per Ton on Farm.
		Tons.	Tons.	Tons.			
Potatoes (Field-crop Competitions)	27	17.00	3.00	8.12	$29 33	$ 6 98	$12 90
Potatoes (Boys' and Girls' Competitions)	32	13.00	2.85	7.00	24 30	6 18	15 88
Wheat	2	1.00	0.71	0.85	36 80	27 20	32 00
Oats	3	1.40	0.50	0.90	56 34	15 10	33 07
Grain-hay	6	6.00	2.00	3.40	15 75	6 00	9 57
Carrots	1	...	...	25.00	...	...	3 78

NOTE.—It must be remembered that above reports were submitted by those winning prizes in the various districts. The crops on which reports were submitted were, therefore, above the average of the district, and the cost per ton determined on such crops will be below the cost to the average farmer. This table shows that the cost of growing and delivering at shipping-point of crops averaging 8.12 tons per acre was $137.22. Basing the above charges on a 5.6-ton crop (the average Provincial yield), we find that the cost to grow an average acre of potatoes in British Columbia in 1917 would be $127.14, or $22.70 per ton.

APPENDIX No. 15.

TUBERCULIN TESTS.

	Premises.	Cattle.	Reactors.	Suspects.
Victoria	134	1,169	44	..
Saanich	24	262	12	..
Cowichan	22	266	14	..
Comox	260	1,944	77	..
Denman Island	27	233	7	..
Parksville	81	384	8	..
Alberni	11	43	..	..
Metchosin	2	18	..	..
Cobble Hill	10	127	19	..
Wellington	7	32	1	..
Chemainus	6	103	..	..
Galiano Island	9	57	..	..
Pender Island	2	55	1	..
Essondale	1	245	14	3
Point Grey	25	46	5	..
North Vancouver	15	105	8	..
Vancouver	63	172	8	..
Lulu Island	188	1,895	61	6
Surrey	96	1,131	50	5
Burnaby	19	58	12	..
Kerrisdale	1	4	..	..
Pitt Meadows	10	171	3	..
Mission	5	65	1	..
Matsqui	119	1,604	68	2
Ladner	25	543	36	14
Langley	96	1,526	30	7
Huntingdon	8	190	2	..
Agassiz	4	65	..	..
Prince Rupert	2	55	3	3
Kitwanga	5	26	..	..
Bowen Island	1	17	1	1
Roberts Creek	1	3	1	..
Barnston Island	1	20	2	..
Lytton	2	36	12	..
Cloverdale	1	54	..	5
Campbell River	8	30	..	..
Chilliwack	43	880	27	8
Armstrong	38	101	2	..
Balfour	4	24	..	..
Creston	1	7	..	..
Enderby	1	7	..	..
Ellison	1	1	..	..
Edgewood	4	17	1	..
Fernie	47	204	11	..
Grand Forks	42	122	1	..
Glenrosa	1	5	..	..
Grande Prairie	1	7	..	..
Kelowna	37	106	11	..
Kamloops	13	164	10	..
Lillooet	1	10	3	..
Malakwa	42	97	..	..
Nelson	1	6	..	..
Needles	1	2	..	..
Okanagan Landing	5	52	..	..
Okanagan Centre	7	21	1	..
Oyama	1	1	..	..
Pritchard	1	1	1	..
Penticton	81	171	2	..
Queen's Bay	1	1	..	..
Revelstoke	21	183	..	..
Rossland	29	156	6	..
Rick Island	1	7	..	..
Summerland	4	14	..	..

APPENDIX No. 15—*Concluded.*

TUBERCULIN TESTS—*Concluded.*

	Premises.	Cattle.	Reactors.	Suspects.
Slocan	4	22	..	..
Vernon	159	237	3	..
Sorrento	7	16	..	..
Westbank	1	1	1	..

APPENDIX No. 16.

SILOS BUILT IN BRITISH COLUMBIA, 1917.

Name.	Place.	Size.	Capacity.
		Feet.	Tons.
Agur, R. V.	Summerland	12 x 30	68
Calhoun, H.	Tappen	12 x 26	59
Carlin, J. C.	Shuswap	16 x 28	112
Carlin, J. A.	Tappen	12 x 26	59
Davie, A.	Ladner	16 x 34	136
Dawson, Rev. L.	Lytton	14 x 32½	100
Dean Bros.	Keatings	12 x 30	68
Gainer, R. H.	Mount Olie	10 x 30	47
Green, C. R.	Beresford	12 x 30	68
Hall, C. S.	Salmon Valley	11 x 30	57
Lowe, W. H.	Cobble Hill (two)	16 x 32	256
McGuire, J. D.	Salmon Arm	12 x 28	64
McLean, H.	Kamloops	10 x 26	40
Nelson, N.	Saltspring Island	11 x 32	62
Oldfield & Son	Elk Lake	10 x 26	40
Pemberton, F. B.	Cowichan	16 x 30	120
Piercy, H.	Denman Island	11 x 30	57
Robson, J. M.	South Vancouver	10 x 26	40
Spetch, S. W.	Pemberton Meadows	10 x 22	35
Thulin, F.	Lund	10 x 26	40
Townsend, F. W.	Mount Tolmie	10 x 26	40
Troup, H. D.	Gabriola Island	10 x 20	32

APPENDIX No. 17.

SILOS FILLED IN BRITISH COLUMBIA, 1917.

Name.	Place.	Size.	Capacity.	Crops Used.
		Feet.	Tons.	
Bekker, B.	Errington	10 x 20	32	Corn.
Calhoun, H.	Tappen	12 x 26	59	Corn.
Carlin, J. C.	Shuswap	16 x 28	112	Corn.
Carlin, J. A.	Tappen	12 x 26	59	Corn.
Dawson, Rev. L.	Lytton	14 x 32½	100	Corn.
Green, C. R.	Beresford	12 x 30	68	Oats and vetch.
Heddle, M.	Willow Point	10 x 20	32	Corn.
Lowe, W. H.	Cobble Hill (two)	16 x 32	256	Oats.
Macdonald, J. D.	Willow Point	10 x 26	40	Corn.
McLean, H.	Kamloops	10 x 26	40	Corn and alfalfa.
Piercy, H.	Denman Island	11 x 32	57	Corn.
Strickland, C. E.	Enderby	12 x 30	68	Alfalfa.

APPENDIX No. 17—*Concluded.*

SILOS BUILT AND FILLED, 1916 AND 1917.

	Number built.	Capacity.	Number filled.	Capacity.
	Tons.			Tons.
1916	13	920	11	620
1917	23	1,600	13	923

APPENDIX No. 18.

TEMPORARY STAFF APPOINTMENTS.

Nature of Appointment.	No.
Advisory Board of Women's Institutes, Secretary	1
Agriculturists (District)	3
Assistant Horticulturist	1
Caretakers—	
Demonstration Plots	8
Egg-laying Contest	1
Carpenter	1
Clerical	5
Cow-testers	7
Foremen at Dry Farms	2
Farm Superintendent	1
Inspectors—	
Assistant, Fruit Pests	2
Brand	2
District Fruit (with Assistants)	26
Foul-brood	3
Imported Fruits at Ports of Entry	17
Potatoes	1
Judges (fall fairs)	17
Lecturers	1
Markets Commissioner	1
Milk-testers	2
Plant Pathologist (Assistant)	1
Publications Branch (Editor)	2
Soil and Crop Instructor	1
Silo Demonstrator	1
Veterinary Inspectors	2
Total	109

APPENDIX No. 19.

TOTAL CORRESPONDENCE RECEIVED AND DISPATCHED BY THE DEPARTMENT OF AGRICULTURE FOR THE YEARS ENDING DECEMBER 31ST, 1916, AND 1917.

	RECEIVED.		DISPATCHED.	
	1917.	1916.	1917.	1916.
Deputy Minister's Office—				
General	4,434	4,762	7,781	5,809
Farmers' Institutes	1,829	1,878	1,606	1,586
Women's Institutes	1,397	1,423	1,140	1,232
Agricultural Associations	744	681	818	670
Publications Branch	1,292	434	536	316
Re Bulletins	...	989	...	174
Horticultural Branch—				
British Columbia Fruit-Growers' Association	694	1,035	731	763
Horticulture	1,604	1,550	1,603	1,555
Inspection of Fruit Branch	660	820	862	960
Live Stock Branch—				
General	4,548	3,119	4,788	3,840
Dairy Division	923	767	1,303	1,175
Poultry Division	1,436	1,695	1,222	1,555
Soil and Crop Division	1,869	1,744	2,562	2,221
Totals	21,430	20,897	24,952	21,856
Increase	533	...	...	...
Decrease	...	...	3,096	...

APPENDIX No. 20.

NEW BULLETINS, CIRCULARS, AND MISCELLANEOUS PUBLICATIONS ISSUED BY DEPARTMENT OF AGRICULTURE IN 1917.

Date.	No. issued.	No.	Name.
Feb. 3.....	2,000	...	Poultry-breeders' Directory.
Feb. 6.....	400	...	Programme, Stock-breeders' Convention.
Feb. 10.....	4,000	...	Programme, Farmers' Institute meetings.
Feb. 12.....	750	Bull. 75	Boys' and Girls' Crop Competitions.
Feb. 28.....	1,000	Cir. 14	Community Breeding.
March 6.....	4,000	...	Agricultural Journal, March.
March 9.....	1,000	...	List of Publications.
March 14.....	200	...	Notice to Nurserymen.
March 19.....	700	...	Circular, Disinfecting Seed-potatoes.
March 24.....	750	Cir. 15	Crop and Live Stock Report, 1916.
March 27.....	500	...	Additional, Disinfecting Seed-potatoes.
March 30.....	750	Bull. 75	Boys' and Girls' Crop Competitions.
April 2.....	1,000	...	Additional, Disinfecting Seed-potatoes.
April 3.....	4,000	...	Agricultural Journal, April.
April 19.....	500	...	Circular *re* Alfalfa and Clover Seed Produce.
April 26.....	500	...	Circular *re* Mosquito-control.
May 1.....	4,000	...	Agricultural Journal, May.
May 1.....	5,000	Cir. Bull. 20	Chicken-pox in Poultry.
May 15.....	1,000	...	Instructions *re* "Noxious Weeds Act."
May 30.....	500	...	Programme, Dairy Convention.
June 5.....	1,200	...	Twenty-seventh Annual Report, British Columbia Fruit-growers' Association.
June 8.....	1,000	Bull. 76	Agricultural Statistics, 1916.
June 8.....	4,000	...	Agricultural Journal, June.
July 18.....	4,000	...	Agricultural Journal, July.
July 20.....	2,000	Cir. 15	British Columbia Farmer and his Silo.
Aug. 9.....	5,000	...	Agricultural Journal, August.
Aug. 15.....	2,000	...	List of Publications.
Aug. 28.....	150	...	Women's Institute Programme.
Aug. 29.....	4,000	...	Agricultural Journal, September.
Aug. 29.....	2,000	...	Circular on Statistics.
	250	...	Rules, Seventh Egg-laying Contest.
Sept. 4.....	400	...	Leaflets, Songs for Women's Institute Conferences.
	150	...	Programme, Women's Institute Conferences.
Sept. 7.....	150	...	Programme, Women's Institute Conferences.
Sept. 18.....	150	...	Programme, Women's Institute Conferences.
	100	...	Rules, "Dairies Regulation Act."
Oct. 1.....	2,000	...	Supplement to Brand Book.
Oct. 16.....	1,600	...	Reply Post-cards for Honey Reports.
Oct. 18.....	5,000	Cir. 17	Crop Report for September.
Oct. 24.....	4,000	...	Journal for October.
Oct. 29.....	3,000	...	Leaflets, Agricultural Relief of the Allies.
Oct. 30.....	500	...	Programmes, Armstrong.
	500	...	Programmes, New Westminster
Nov. 17.....	3,000	Cir. 18	Crop Situation in British Columbia.
Nov. 19.....	4,000	...	Agricultural Journal, November.
Dec. 3.....	400	...	Diaries *re* Cost of Producing Farm Crops.
Dec. 17.....	4,300	...	Agricultural Journal, December.
Dec. 29.....	1,000	...	Annual Report of Department, 1916.
Total	88,400		

APPENDIX No. 21.

BULLETINS AND CIRCULARS SENT OUT DURING THE YEAR 1917.

Bulletins.

		No. sent out.
No. 26.	Practical Poultry-raising	3,312
„ 33.	Fruit-growing Possibilities on Skeena River	261
„ 39.	Natural and Artificial Incubating and Breeding	1,618
„ 44.	Irrigation in British Columbia	150
„ 48.	Exhibiting Fruits and Vegetables	906
„ 49.	Market Poultry	1,714
„ 54.	British Columbia Women's Handbook	175
„ 55.	Care and Marketing of Eggs	1,619
„ 58.	Farm Storages for Fruits and Vegetables	140
„ 59.	Agricultural Statistics for the year 1913	1,535
„ 60.	Hog-raising in British Columbia	1,922
„ 63.	Poultry-house Construction	2,930
„ 64.	Angora and Milch Goats	2,594
„ 65.	Agricultural Statistics of British Columbia, 1914	475
„ 66.	Silos and Silage	1,685
„ 67.	Feeding and Management of Dairy Cattle	2,595
„ 68.	Diseases and Pests of Cultivated Plants	3,436
„ 69.	Field-crop Competitions, 1916	1,020
„ 70.	Boys' and Girls' Field-crop Competitions	1,410
„ 71.	Butter-making on the Farm	1,934
„ 72.	Milk-testing and Dairy Records	475
„ 73.	Field-crop and Seed Competitions, 1917	1,800
„ 74.	Breeding and Selection of Commercial Poultry	926
„ 75.	Boys' and Girls' Competitions, 1917	1,400
„ 76.	Agricultural Statistics of British Columbia, 1916	258
	Total	36,290

Circulars.

		No. sent out.
No. 11.	Honey Production in British Columbia, 1916	1,500
„ 12.	Seed-growers' Directory	750
„ 13.	Instructions *re* Co-operative Variety Tests	1,200
„ 14.	Community Breeding	800
„ 15.	The British Columbia Farmer and his Silo	2,850
	Total	7,100

APPENDIX No. 21—*Concluded.*

Circular Bulletins.

		No. sent out.
No.	1. Thousand-headed Kale	246
„	2. Tuberculosis in Poultry	85
„	3. Construction of Fresh-air Brooders	130
„	4. Management of Turkeys	411
„	5. Clover Dodder	645
„	6. Seed Improvement	525
„	7. Keeping Poultry Free from Lice	1,671
„	8. Corn-growing in British Columbia	80
„	10. Care of Milk and Cream	760
„	11. Poultry-keeping on a City Lot	628
„	12. Management of Geese	1,306
„	13. Root-seed growing	385
„	14. The Use of Agricultural Lime in British Columbia	2,695
„	15. Profitable Ducks	781
„	18. Noxious Weeds, their Identification and Eradication	650
„	19. Poultry Rations and their Practical Application	1,625
„	20. Chicken-pox in Poultry	728
	Total	13,351

Horticultural Circulars.

No.	2. Onion-culture	185
„	3. Selection of Orchard Sites and Soils	275
„	4. Insects Injurious to Orchards	720
„	6. Spray Calendar	553
„	7. Fungous Diseases of Orchard and Garden	265
„	8. Packing Orchard Fruits	460
„	9. Sprays and Spraying	367
„	10. Potato-culture	560
„	11. Progress and Prospects in Fruit and Vegetable Growing	370
„	12. Orchard Intercrops	360
„	14. Practical Irrigation	410
„	15. Cabbage, Celery, and Tomato Production	720
„	17. Planting Plans and Distances	298
„	18. Fruit Markets Commissioners' Report	60
„	19. Propagation and Selection of Nursery Stock	340
„	22. Thinning Fruit-trees	410
„	24. The Home Vegetable Garden for Southern Interior Districts	375
„	27. Methods of Fruit Picking and Handling	400
„	28. Fertilizers for Fruits and Vegetables	1,775
„	29. Varieties of Fruit recommended for Commercial Planting	1,978
	Total	10,881

Reports.

Annual Report, Department of Agriculture, 1915	262
British Columbia Fruit-growers' Association, Annual Report, 1915	550
British Columbia Fruit-growers' Association Annual Report, 1916	225
Farmers' Institute Annual Report, 1915	350
Women's Institute Annual Report, 1915	260
British Columbia Dairymen's Association Annual Report, 1915	100
Third International Egg-laying Contest Report	375
Proceedings of the Entomological Society, 1916	145
Total	2,267

APPENDIX No. 21—*Concluded.*

Miscellaneous.

Agricultural Journal (monthly)	37,800
List of Agricultural Books recommended for Farmers	126
Revised Rules and Regulations, Board of Horticulture	256
Finance in Relation to Women's Citizenship	225
Rules and Regulations, Women's Institutes	540
List of Books and Magazines recommended for Women's Institutes	120
Rules and Regulations for Farmers' Institutes	530
Stock-breeders' Directory	325
Poultry-breeders' Directory	1,500
British Columbia Crop and Live Stock Reports	4,500
Total	45,922

Summary.

Total Bulletins	36,290
Total Circulars	7,100
Total Circular Bulletins	13,351
Total Horticultural Circulars	10,881
Total Reports	2,267
Total Miscellaneous	45,922
Grand total	115,811

APPENDIX No. 22.

SUMMARY OF APPROPRIATIONS, DEPARTMENT OF AGRICULTURE.

	1915-16.	1916-17.	1917-18.
General—			
Salaries of staff officials	$72,428 00	$73,496 00	$65,752 00
Administration, General Department vote, travelling expenses of officers on duty, and miscellaneous	50,000 00	45,000 00	38,000 00
Agricultural Associations—			
Agricultural Associations, including grants in aid of prize-lists, specific grants for buildings, and judges' expenses	50,000 00	30,000 00	20,000 00
Exhibition			
Exhibition and publicity work	8,000 00	*Nil.*	*Nil.*
Institutes—			
Farmers' and Women's Institutes	27,500 00	27,500 00	22,500 00
Horticulture—			
Board of Horticulture, experimental orchards, demonstration spraying, precooling and cold storage, and British Columbia Fruit-growers' Association	13,250 00	9,750 00	34,250 00
Inspection of fruit, fumigation of nursery stock, etc.	35,000 00	35,000 00	
Fruit-packing schools	2,000 00	1,500 00	
Live stock—			
Various associations	13,250 00	7,750 00	27,500 00
Compensation for cattle slaughtered	25,000 00	12,000 00	
Suppression of noxious weeds	5,000 00	10,000 00	
Totals	$301,428 00	$251,996 00	$208,002 00

APPENDIX No. 23.

"AGRICULTURAL INSTRUCTION ACT, 1917-18."

(A.) Instruction and Demonstration.

1.	Agricultural and Horticultural Instructors and District Representatives	$ 3,500 00
2.	Field-crop demonstation stations	5,000 00
3.	Dry-farming demonstration stations	3,000 00
4.	Horticultural demonstration stations	3,000 00
5.	Poultry demonstration stations and egg-laying contests	1,500 00
6.	Alfalfa-plots	500 00
7.	Silo demonstrations	3,000 00
8.	Drainage demonstrations	1,000 00
9.	Seed-distribution and co-operative variety tests, seed production, seed fairs	5,500 00
10.	Dairying Cow-testing Associations	3,000 00
11.	Bee-keeping	2,500 00
12.	Field-crop Competitions	2,000 00
13.	Boys' and Girls' Clubs	1,000 00
14.	Fruit-packing schools and demonstrations	1,000 00
15.	Market-work	4,500 00
16.	Agricultural Journal, Publications Branch	5,000 00

(B.) Investigation and Research.

17.	Pathological and entomological investigation and research	2,000 00
18.	Weed investigation and survey	1,500 00

(C.) Elementary Agricultural Education.

19.	Agricultural instruction in public, high, and normal schools, household science, training of teachers, grants	20,000 00
20.	Contingencies and miscellaneous	699 06
	Total	$69,199 06

NOTE.—Cost of preparing and printing bulletins and circulars, if undertaken, may be charged the subdivision to which said publications relate.

APPENDIX No. 24.

PROVINCIAL VOTES, YEAR ENDING DECEMBER 31ST, 1917.

Vote.			No. of Vouchers.		Total.
101	96	Administration and miscellaneous	194	448	642
2	7	Board of Horticulture	4	5	9
4	...	Demonstration orchards, etc.	3	...	3
5	...	Cold-storage work	4	...	4
6	99	Fruit-packing schools	57	2	59
7	100	Agricultural Associations	11	34	45
8	102	British Columbia Dairymen's Association	87	4	91
9	103	British Columbia Entomological Society	...	1	1
110	104	British Columbia Fruit-growers' Association	46	17	63
11	106	British Columbia Poultry Association	40	2	42
12	107	British Columbia Stock-breeders' Association	36	20	56
13	108	Flockmasters' Association	...	1	1
14	109	Farmers' Institutes	51	59	110
15	110	Women's Institutes	43	115	158
16	111	Inspection of nursery stock, etc.	92	164	256
17	112	Suppression of diseases, etc.	87	214	301
19	98	Compensation for T.B. cattle killed	36	220	256
120	114	Travelling expenses, officers	114	224	338
...	101	British Columbia Bee-keepers' Association	...	1	1
...	105	British Columbia Goat-breeders' Association	...	2	2
...	15	Special warrant	...	60	60
		Total Provincial vouchers	905	1,593	2,498
		Total Federal vouchers	...	...	1,248
		Grand total	...	...	3,746

APPENDIX No. 25.

FAIRS ARRANGED BY DEPARTMENT OF AGRICULTURE, SEASON 1917.

Circuit No. 1—

Parksville	Sept. 12
Nanaimo	„ 11-13
Evergreen (Farmers' Institute)	„ 13
Lasqueti Island	„ 15
Cape Scott (Farmers' Institute)	„ 17
Denman (Farmers' Institute)	„ 18
Courtenay	„ 20-21
Duncan	„ 20-22
Islands	„ 22
Ladysmith	„ 26-27
Alberni	„ 27
Cobble Hill	Oct. 2-3
Saanichton	„ 5-6

APPENDIX No. 25—*Concluded.*

FAIRS ARRANGED BY DEPARTMENT OF AGRICULTURE, SEASON, 1917—*Concluded.*

Circuit No. 2—		
Vancouver	Aug.	20-26
North Vancouver	Sept.	7-8
Central Park	„	13-15
Maple Ridge	„	18-19
Coquitlam	„	20
Mission	„	20-21
Agassiz	„	26
Langley Fort	„	26
Burquitlam	„	28-29
Surrey Centre	Oct.	3
Aldergrove	„	4-5
Circuit No. 3—		
Heffley Creek	Sept.	19
Pritchard	„	21
Kamloops	„	25-27
Circuit No. 4—		
Invermere	Aug.	29-30
Natal	Sept.	3
Creston	„	5
Cranbrook	„	12-13
Fruitvale	„	15
Trail	„	18-19
Nelson	„	19-20
Rossland (Horticultural Society)	„	21
Grand Forks	„	25-26
Circuit No. 5—		
Kelowna	Sept.	12-13
Armstrong	„	20-21
New Denver	„	25-26
Needles	„	28-29
Burton	Oct.	2
Nakusp	„	3-4
Summerland	„	24-25
Rock Creek (Farmers' Institute)	„	26
Circuit No. 6—		
Prince George	Sept.	11-12
Prince Rupert	„	19-21
Quesnel	„	28-29
Bella Coola	Oct.	12

APPENDIX No. 26.

GRANTS TO AGRICULTURAL ASSOCIATIONS, YEAR ENDING DECEMBER 31ST, 1917.

Nanoose Agricultural Association	$ 100 00
Nanaimo Agricultural and Horticultural Association	500 00
Lasqueti Island Agricultural Association	100 00
Comox Agricultural and Industrial Association	300 00
Cowichan Agricultural Association	600 00
Islands Agricultural and Fruit-growers' Association	400 00
Ladysmith Agricultural Society	350 00
Cobble Hill District Agricultural Association	100 00
North and South Saanich Agricultural Society	300 00
Alberni Agricultural and Industrial Association	200 00
Aldergrove Agricultural Association	100 00
Central Park Agricultural Association and Farmers' Institute	250 00
Maple Ridge Agricultural Association	200 00
Coquitlam Agricultural Association	150 00
Agassiz Agricultural and Horticultural Association	250 00
Langley Agricultural Association	200 00
District of Surrey Agricultural Association	250 00
Burquitlam Agricultural Association	150 00
North Vancouver Horticultural Society	250 00
Mission Agricultural Association	200 00
North Thompson Agricultural Association	150 00
Pritchard Agricultural Association	100 00
Kamloops Agricultural Association	800 00
Windermere District Agricultural Society	300 00
Elk Valley and Natal Agricultural Association	100 00
Cranbrook District Agricultural Association	600 00
Fruitvale Agricultural Association	100 00
Trail Fruit Fair Association	250 00
Nelson Agricultural and Industrial Association	800 00
Grand Forks Agricultural Association	600 00
Kelowna Agricultural and Horticultural Association	600 00
Armstrong and Spallumcheen Agricultural Society	1,000 00
Slocan Lake Agricultural Association	150 00
Arrow Lakes Agricultural and Industrial Association	300 00
Needles and District Agricultural Association	200 00
Summerland Agricultural Association	400 00
Burton District Agricultural Association	100 00
Fort George Agricultural and Industrial Association	500 00
Northern British Columbia Agricultural and Industrial Association	500 00
Bella Coola Fair and Agricultural Association	100 00
Cariboo Agricultural and Horticultural Association	250 00
Total	$12,850 00
Total, 1916	$13,425 00

APPENDIX No. 27.

EXPENDITURE IN AID OF FARMERS' INSTITUTES, YEAR ENDING DECEMBER 31ST, 1916, AND 1917.

	Year 1917.		Year 1916.	
	Total.	Average Cost per Institute.	Total.	Average Cost per Institute.
Membership allowances	$4,022 35	$27 17	$3,370 75	$23 09
Grant to Secretaries	3,493 70	23 60	2,506 18	24 01
Field-crop competitions	830 00	5 61	997 00	6 85
Short courses, spring meetings, and general lecture-work	...	...	404 00	2 76
Importation of pure-bred stock	1,539 61	10 40	2,955 77	20 24
Erection of manure-hopper at Prince Rupert	160 00	1 09	620 75	4 25
Postage, printing, and bulletins	1,606 15	10 86	629 33	4 31
Poison for "gopher" campaign	122 75	83	...	...
Advisory Board, expenses	339 50	2 29	...	...
Grants to institutes holding fairs	200 00	1 35	...	...
Miscellaneous	318 96	2 16	838 28	5 74
Totals	$12,633 02	$85 36	$15,088 69	$103 35

APPENDIX No. 28.

FARMERS' INSTITUTE MEETINGS, 1917.

Institute.	Place of Meeting.	Date.
Islands—		
South Saanich	....	Feb. 16
South Saanich	Temperance Hall, Keating	Feb. 16
South Saanich	Temperance Hall, Keating	Feb. 17
Victoria	Agricultural Hall, Gordon Head	Feb. 19
Victoria	Agricultural Hall, Gordon Head	Feb. 19
Cowichan	Duncan	Feb. 19
Cowichan	Duncan	Feb. 19
Cowichan	Duncan	Feb. 19
Islands	Ganges	Feb. 19
Comox	Courtenay	Feb. 20
Comox	Courtenay	Feb. 21
Lower Mainland—		
Delta	Ladner	Feb. 23
Surrey	Cloverdale	Feb. 24
Chilliwack	East Chilliwack	Feb. 26
Chilliwack	East Chilliwack	Feb. 26
Chilliwack	Sardis, Chilliwack	Feb. 26
Chilliwack	Sardis, Chilliwack	Feb. 26
Chilliwack	Rosedale	Feb. 27
Chilliwack	Rosedale	Feb. 27
Maple Ridge	Hammond	Feb. 28
Maple Ridge	Hammond	Feb. 28
Mission	Mission	Feb. 28
Nicola to Salmon Arm—		
Nicola	Lower Nicola (Coyle)	Feb. 28
Notch Hill and Shuswap	Notch Hill	March 1
Martin's Prairie	Pritchard	March 1
Salmon Arm	Salmon Arm	March 2
Salmon Arm	Salmon Arm	March 2
Silver Creek	Silver Creek	March 2

APPENDIX No. 28—*Concluded.*

FARMERS' INSTITUTE MEETINGS, 1917—*Concluded.*

Institute.	Place of Meeting.	Date.
Okanagan, North—		
Spallumcheen	Armstrong	March 3
Spallumcheen	Armstrong	March 3
North Okanagan	Enderby (King Edward)	March 3
North Okanagan	Grindrod	March 3
Okanagan	Coldstream	March 5
Okanagan	Vernon	March 5
Okanagan	Vernon	March 5
Lumby	Lumby	March 10
Okanagan, South—		
Kelowna	Kelowna	March 6
Kelowna	Kelowna	March 6
Kelowna	Rutland	March 6
Kelowna	Rutland	March 6
Kelowna	Kelowna	March 7
Kelowna	Kelowna	March 7
Naramata	Naramata	March 5
Peachland	Peachland	March 5
Peachland	Peachland	March 8
Westbank	Westbank	March 8
Okanagan Centre	Woods Lake	March 7
Penticton	Penticton	March 7
Penticton	Penticton	March 8
Kaleden	Kaleden	...
Grand Forks and West Kootenay—		
Grand Forks	Grand Forks	March 8
Grand Forks	Grand Forks	March 9
Glenside	Bridesville	...
South Slocan	Passmore	March 10
Creston	Creston	March 10
Creston	Creston	March 10
Creston	Creston	March 12
Creston	Erickson	March 10
Creston	Erickson	March 10
Creston	Erickson	March 12
Harrop and Procter	Harrop	March 12
West Kootenay	Nelson	March 12
West Kootenay	Nelson	March 12
Willow Point	Willow Point	March 13
Arrow Lakes to Golden—		
Robson	Robson	March 13
Arrow Lakes	Nakusp	March 14
Arrow Lakes	Nakusp	March 14
Burton City	Burton	March 15
Needles	Needles	March 15
Fire Valley	Edgewood	March 15
Revelstoke	Revelstoke	March 16
Malakwa	Malakwa	March 16
Columbia Valley	Wapta School	March 17
Golden	Golden	March 17

APPENDIX No. 29.

EXPENDITURES IN AID OF WOMEN'S INSTITUTES, YEARS ENDING DECEMBER 31ST, 1916 AND 1917.

	YEAR 1917.		YEAR 1916.	
	Total.	Average Cost per Institute.	Total.	Average Cost per Institute.
Department grant to Secretaries	$1,475 00	$25 00	$1,475 00	$25 00
Membership allowances	1,566 75	26 56	1,361 25	23 07
Lecturers' expenses	1,349 03	22 86	165 05	2 80
Advisory Board—				
(*a.*) Salary of Secretary	480 00	8 14	480 00	8 13
(*b.*) Expenses of members	1,055 86	17 90	940 38	15 94
Flower-shows—				
(*a.*) Prizes	233 12	3 95	288 47	4 89
(*b.*) Grants	483 00	8 18	529 25	8 97
Conferences	341 60	5 79	448 31	7 60
Printing, subscriptions, etc.	1,257 94	21 32	190 86	3 24
Miscellaneous	499 73	8 47	274 20	4 64
Totals	$8,742 03	$148 17	$6,152 77	$104 28

APPENDIX No. 30.

WOMEN'S INSTITUTE FLOWER-SHOWS, 1917.

1.	Hatzic	June	21
2.	Lake Hill	„	29
3.	Matsqui	„	30
4.	Haney	July	6
5.	Parksville	„	18
6.	South Saanich	„	21
7.	Colwood	„	25
8.	Kaslo	„	27
9.	Shawnigan	„	28
10.	West Saanich	„	28
11.	Tappen	Aug.	1
12.	Agassiz	„	2
13.	Kelowna	„	4
14.	Langford	„	4
15.	Nakusp	„	7
16.	Harrop	„	8
17.	Langley Fort	„	8
18.	Upper Sumas	„	9
19.	Willow Point	„	9
20.	Central Park	„	10
21.	Peachland	„	10
22.	Garden City (child-welfare)	„	11
23.	Mount Ida	„	15
24.	Salmon River Valley	„	15
25.	Penticton	„	16
26.	Cranbrook	„	21
27.	Tynehead	„	22
28.	Kalamalka	Aug.	
29.	Okanagan Centre	„	
30.	Crawford Bay	Sept.	5
31.	Creston	„	5
32.	Garden City	„	5
33.	Similkameen	„	7
34.	Strawberry Hill	„	12
35.	Coquitlam	„	20
36.	Hazelmere	„	
37.	Summerland and West Summerland	Oct.	24-25
38.	Naramata	„	25
39.	Rock Creek	„	25
40.	Gordon Head (exhibition of women's work)	...	
41.	Nelson	...	

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1918.