PROVINCE OF BRITISH COLUMBIA

THIRTY-FIFTH ANNUAL REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR THE YEAR 1940

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1941.

To His Honour E. W. HAMBER,
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 1940.

K. C. MACDONALD,
Minister of Agriculture.

Department of Agriculture,
Victoria, B.C., March 31st, 1941.

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DEPARTMENT OF AGRICULTURE OFFICERS.

Honourable K. C. MacDonald, Minister.
J. B. Munro, M.S.A., Deputy Minister.

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George H. Stewart, Statistician, Victoria, B.C.
C. P. L. Pearson, Assistant Accountant, Victoria, B.C.
L. W. Johnson, Senior Clerk, Victoria, B.C.
A. J. Hourston, General Assistant, Victoria, B.C.
A. H. Shotbolt, Exhibition Specialist, Victoria, B.C.
C. C. Kelley, B.S.A., Soil Survey, Kelowna, B.C.
James S. Wells, Clerk, Victoria, B.C.

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E. C. Hunt, B.S.A., District Horticulturist, Nelson, B.C.
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R. P. Murray, B.S.A., District Field Inspector, Penticton, B.C.
C. B. Twigg, B.S.A., District Field Inspector, Creston, B.C.
H. H. Evans, District Field Inspector, Vernon, B.C.
C. R. Barlow, District Field Inspector, Salmon Arm, B.C.
John Tait, District Field Inspector, Summerland, B.C.
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J. W. Eastham, B.Sc., Plant Pathologist, Vancouver, B.C.
W. R. Foster, M.S.A., Assistant Plant Pathologist, Saanichton, B.C.
Max Ruhmann, B.A., Provincial Entomologist, Vernon, B.C.
A. W. Finlay, Provincial Apiarist, New Westminster, B.C.
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S. S. Phillips, B.S.A., Assistant Field Crops Commissioner, Victoria, B.C.
Walter Sandall, Field Inspector, Vancouver, B.C.

LIVE STOCK DIVISION.

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Henry Rive, B.S.A., Dairy Commissioner, Victoria, B.C.
F. C. Wasson, M.S.A., Dairy Instructor, Kelowna, B.C.
F. Overland, Dairy Instructor, Vancouver, B.C.
G. H. Thornbery, Assistant (Milk Records), Victoria, B.C.
Dr. A. Knight, Chief Veterinary Inspector, Victoria, B.C.
Dr. M. Sparrow, Provincial Veterinary Inspector, Vancouver, B.C.
Dr. J. D. MacDonald, Provincial Veterinary Inspector, Victoria, B.C.
Dr. D. H. McKay, Provincial Veterinary Inspector, Kamloops, B.C.
J. R. Terry, Poultry Commissioner, Victoria, B.C.
George Pilmer, Brand Recorder, Victoria, B.C.
R. Cahilty, Brand Inspector, Kamloops, B.C.
G. A. Luyat, B.S.A., District Agriculturist, Kamloops, B.C.
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Shirley G. Preston, M.S.A., District Agriculturist, Smithers, B.C.
Wm. MacGillivray, District Agriculturist, Salmon Arm, B.C.
Jas. E. Manning, District Agriculturist, Prince George, B.C.
T. S. Crack, District Agriculturist, Pouce Coupe, B.C.

REPORT *of the* DEPARTMENT OF AGRICULTURE.

REPORT BY THE DEPUTY MINISTER.

J. B. MUNRO, M.S.A.

The Honourable K. C. MacDonald,
Minister of Agriculture, Victoria, B.C.

SIR,—I have the honour to submit herewith the report of the Department of Agriculture for the year ended December 31st, 1940.

NEW LEGISLATION.

At the fifth session of the Nineteenth Legislature an Act to amend the "Fruit, Vegetables, and Honey Grades Act" was passed and new measures intituled the "Poultry and Poultry Products Act," the "Wool Grades Act," and the "Hog Grading Act" were also enacted.

"*Fruit, Vegetables, and Honey Grades Act Amendment Act, 1940.*"—This Act is amended in section 3 by adding to subsection (1) a new clause "empowering and requiring any Inspector or other person to do within the Province anything deemed necessary to enforce or assist in the enforcement of any order or regulation made under the 'War Measures Act' of the Dominion."

"*Poultry and Poultry Products Act.*"—This Act provides for the classification of eggs, dressed poultry, and live poultry according to prescribed standards; provides for the appointment by the Lieutenant-Governor in Council of Inspectors necessary for carrying out the provisions of the Act; and authorizes the Lieutenant-Governor in Council to make regulations with respect to any poultry product produced or sold within the Province. The Act further provides for the disposal of any poultry product seized for any contravention of the provisions of the Act, and indicates penalties for misbranding of packages or obstruction of officials, for obliteration of marks or brands, for false substitution of packages, or for unauthorized transportation of poultry products seized or detained by an Inspector.

The intention of this Act is to permit of Federal Inspectors holding Provincial appointment to carry out duties assigned to them under the Dominion Act and regulations relating to poultry and poultry products.

"*Wool Grades Act.*"—This Act establishes grades for wool, provides for the inspection, grading and packing, transporting and advertising of wool within the Province, and prescribes inspection fees, designates places where wool may be inspected, and provides for exemptions.

"*Hog Grading Act.*"—This Act permits of regulations being passed in the language of regulations already established under the Dominion Act of the same name and being enforced within the Province by Federal hog graders named by the Province to carry out the provisions of this Act.

HORNED CATTLE DEDUCTIONS.

Under the "Horned Cattle Purchases Act" of 1939, regulations were passed this year which came into effect on April 1st and provided for the deduction of $1 to be made on each head of cattle with horns being shipped to an abattoir in British Columbia for slaughter. Cattle shipments are reported by the Brand Inspectors and deductions which should be made are indicated on their reports. The actual deductions are made by the cattle-shippers and confirmed by the buyers by the use of appropriate forms upon which complete data are submitted to this Department with reference to each cattle shipment.

Cattlemen and buyers have given splendid co-operation and at the end of December approximately $2,000 has been placed at the credit of the horned cattle fund from deductions sent in by shippers or buyers. The Act giving authority for these deductions permits of the fund so established to be used for the benefit of the live-stock industry.

VANCOUVER ISLAND T.B.-FREE AREA.

During the present year a total of 18,034 head of cattle within the Vancouver Island T.B.-free area have been subjected to the tuberculin test by veterinarians of the Federal

Department of Agriculture. Only 123 reactors were uncovered in thirty-one herds. This indicates a very satisfactory condition with reference to bovine tuberculosis existing on the agricultural portion of Vancouver Island and the adjacent Gulf Islands.

In the first sixty-day retest conducted by Federal Veterinarians only eleven one-hundredths of 1 per cent. of the total number of cattle within the area were found to react.

It may be noted that a small number of animals within the area which have been living almost in the wild state in the woods during the past few years could not be captured for testing purposes. However, the number of " escapes " of this kind is small and the animals living in a state of nature may be safely regarded as being free from infection.

AGRICULTURAL HISTORY.

It seems appropriate this year to record the earliest attempts in honey production within the Province. Copies of early newspapers in the Archives of British Columbia indicate that two colonies of bees were brought to Vancouver Island from Oregon in the spring of 1860 by J. D. B. Ogilvie, who resided about 2 miles from the Fort. Mr. Ogilvie succeeded in building up an apiary of six colonies the year following his importation and in the spring of 1862 he increased his apiary to twelve colonies.

Bees were expensive in 1860, being quoted at from $100 to $150 a colony, and honey was retailing at $1 a pound. The early press reports state that Vancouver Island's first honey-bees provided a surplus of 50 lb. of honey from each colony.

The claim has been made that the priests who entered the Okanagan Valley from Oregon territory and settled in the vicinity of Kelowna in the fall of 1858 brought in honey-bees several years after they had established their Mission. Just when the bees were brought in by them is not definitely known, but they had an apiary established in that region prior to 1878. Early records indicate that the priests were " bee-keepers " in more than one sense because prior to the establishment of orchards and the production of alfalfa and sweet clover there were insufficient nectar-yielding plants in the Okanagan Valley to maintain an apiary with any likelihood of profitable returns. The development of irrigation systems and the introduction of improved agriculture in the Okanagan Valley has greatly benefited the honey industry.

Bees were imported to the Lower Mainland of British Columbia about 1878 from Stillacom, Washington, and were established in the Colebrook District. There are at present approximately 3,000 bee-keepers registered in British Columbia, but only a small percentage of them are maintaining commercial apiaries.

BEEF GRADING ADMINISTRATION AND HISTORY.

In reporting on his operations during 1940, Alex. McNeill, temporary Inspector under the " Beef Grading Act," reports that he has made 2,775 individual meat-market inspections within the prescribed area. Most of his inspections were for the purposes of checking on display beef cuts, price cards, brands, and advertising. Minor mistakes were discussed with responsible parties and only one prosecution was found necessary during the year. This prosecution was for an infraction of the regulations regarding brands removal. One seizure of ungraded and unbranded beef was made. The situation with reference to retail sale of beef cuts in Vancouver is satisfactory from the standpoint of both consumer and producer.

Frozen beef sold under trade names occupied the attention of the Inspector this year, but toward the end of the year interest in slight frozen beef has declined, although frozen cow beef in cuts is proving acceptable at many of the meat markets.

Although the meat stores within the Greater Vancouver area are subject to slight change in numbers, the total at the end of the year is 227 stores operated by white owners and thirteen operated by Orientals, making a total of 240 in the City of Vancouver. In addition, there are ninety-four stores and markets operated in New Westminster, Burnaby, Marpole, North Vancouver, and West Vancouver. Approximately ninety-six of the meat stores are operated by chain store organizations.

In view of the importance of beef grading to producers and consumers and in view of the interest that is being taken in this British Columbia policy by other Canadian Provinces, it seems advisable to present herewith a brief history of beef grading. The following history has been prepared by Jack Byers, District Supervisor for the Live Stock and Poultry Division of the Production Service of the Federal Department of Agriculture:—

" During the two years in which beef grading has been in effect in the area of Greater Vancouver and New Westminster there has been a consistent and continuous improvement in the type of beef offered for sale, the advertising methods of retailers, the cash returns of the producers of the beef, and the general attitude of the consuming public toward this measure.

" The record high week for beef grading within the area was in November, 1940, when more than 1,000,000 lb. of beef were examined by the graders. The total quantity of beef graded within the area in 1940 was in excess of 40,000,000 lb.

" The story behind the beef grading service of British Columbia is the story of progressive struggle on the part of beef cattlemen, packers, butchers, and consumers. The struggle has been going on for upwards of twenty years, but it was in 1929 that the attention of the public in British Columbia was directed to classification of beef according to its grade and quality.

" The voluntary system of beef grading, introduced by the Dominion Department of Agriculture in 1929, was the outcome of the National Beef Conference held in Winnipeg, June 28th and 29th, 1928. This voluntary system provided for two grades of branded beef; the choice beef from well-finished steers and heifers was marked with a ' red ' brand and the percentage of beef of that quality marketed in 1929 was not high. There was considerably more of the second grade of beef, which was branded with a ' blue ' stripe.

" Prior to this time, cattlemen throughout Western Canada had been advocating the grading of beef, as baby beef was growing in popularity and producers and finishers of this class of cattle felt they were not getting any premium, or as much premium as they should, for the finished product, nor encouragement to produce these young, quality animals.

" The Dominion Department of Agriculture made a special effort at this time to educate housewives in quality meats and did succeed in focusing their attention on the economy in asking for either ' red ribbon ' or ' blue ribbon ' beef. However, the efforts at that time were made on a more or less voluntary basis and, after some time, cattlemen began to feel that there was a lack of interest on the part of all concerned in keeping graded beef before the public and up to the uniform standard set out by the regulations.

" For several years prior to 1938 the B.C. Beef Cattle Growers' Association were agitating for compulsory beef grading and their strongest argument was that the Prairies, especially Alberta, were combed all the time for the plain and medium cattle for the Vancouver market, large shipments of these low-grade cattle causing gluts on the Vancouver market, especially when British Columbia range cattle were coming into that market. These gluts of cattle, as you know, caused bad breaks in prices, ruinous to the British Columbia cattlemen.

" This agitation resulted in many conferences between producers, processors, retailers, and consumers, Dominion and Provincial officials. From these meetings a presentation was made to the Provincial Government recommending a compulsory system of beef grading, branding, advertising, displaying, and marketing. And from this the beef cattle industry of British Columbia got the ' Beef Grading Act ' of 1937 drafted and passed by the Provincial Legislature.

" At that time it was considered that the enforcement of the provisions of the Act should be withheld until reasonable consideration had been given to the needs of the beef cattle industry, the wishes of the meat trade, and the convenience of customers. Consequently, section 10 of the Act provided that ' This Act shall come into operation at such time or times, and throughout the Province, or within any defined part of the Province, as may be fixed from time to time by the Lieutenant-Governor by his Proclamation.'

" Regulations were drafted and after several delays the area was proclaimed and the regulations were approved on November 16th, 1938, to come into operation at midnight on the 3rd day of December, 1938. The area covered was described as ' the Cities of New Westminster, North Vancouver, and Vancouver, and the Municipalities of Burnaby, West Vancouver, and the District of North Vancouver.'

" Under the regulations the first Inspectors appointed to carry out the provisions of the Act and the regulations were, namely, Matthew Vincent Campbell and Roy Trimble, of the Dominion Department of Agriculture, and Walter Sandall, all of Vancouver. Being a Provincial Government officer, Walter Sandall's responsibility included the inspection of meat departments in the larger stores and the butcher-shops throughout the area. M. V. Campbell was responsible for, and is still in charge of, the inspection and grading of beef slaughtered for sale within the area.

" There was considerable educational work to be done by the Inspectors with all classes concerned with the beef trade, as for a number of years over 60 per cent. of the beef offered in Vancouver had been of the lower grades.

" A glance at the records of beef grading in December, 1938, reveals the general condition of the cattle presented for grading and branding. During the first week a total of 1,507 head of cattle, with a total weight of 828,855 lb., were graded. The group contained 92 head of A-1 and 282 head of Grade A carcasses, steers, and heifers. There were 485 Grade B, 302 Grade C, and 154 Grade D steers and heifers. The cow carcasses were graded as 65 Grade B cow, 73 Grade C cow, and 54 Grade D cow.

" The second week's grade statement deals with 1,433 head of cattle, of which 159 were Grade A-1 and 219 were Grade A steers and heifers. There were 448 Grade B, 159 Grade C, and 36 Grade D steers and heifers, with 49 Grade B cow, 96 Grade C cow, and 54 Grade D cow. From this week's offering 213 carcasses were marked out as ' canners, bulls, etc.,' and were not branded for sale on fresh-beef market.

" Before the end of December, 1938, the butchers of the area recognized the fact that beef grading and branding was definitely a policy of the British Columbia Government and that inspection and certification of the retail trade was being carefully and consistently conducted. Naturally, many questions arose with reference to the interpretation of the Act and the regulations during the first few months and it was found necessary by the end of February, 1939, to amend the regulations with respect to the size and prominence of the grade letters used in advertising the beef, either on display cards, or newsprint copy. The question of advertising was particularly dealt with in the amendments to the regulations which came into force at midnight on the 5th day of March, 1939.

" From its inception there were many butchers within the area who conformed in every respect with the provisions of the Act and the regulations made thereunder. There were, unfortunately, a few individuals who set about to evade the requirements with respect to the sale of beef. It was impossible for one Inspector to maintain supervision throughout the whole area in such a way as to enable him to secure evidence against those who refused to abide by the regulations that were being observed by the majority. Therefore, an additional Inspector, Alexander McNeill, was, on August 1st, 1939, appointed under the ' Beef Grading Act ' for a period of one month.

" From time to time since his appointment at the beginning of August, 1939, Mr. McNeill has kept the Department informed of conditions as he found them in the butcher-shops and meat departments, of suggestions that are advanced to him by proprietors or clerks of infractions or misdemeanours that have come to his attention. He was successful in directing a number of offenders along courses that they have followed since, to the advantage of producers and consumers alike. There were several cases, however, in which operators or owners of butcher-shops continued to disregard the regulations. During the year 1939, eight informations were taken out and prosecutions instituted within the area. In all of the eight cases convictions were obtained. In the city of New Westminster three fines of $10 each were imposed and in Vancouver five fines of $15. The fines were all paid by the accused persons to the city authorities in their respective city Police Courts.

" At the end of the first twelve-month period, Inspector M. V. Campbell reported on the beef carcasses graded and branded at slaughter-houses within the area. His report shows that a total of 72,632 beef animals were dealt with during the period. The percentages of the several grades of animals are shown in the table attached (Appendix No. 9) and you will note that 69 per cent. of the cattle graded are in the three top grades.

" As mentioned at the outset, there were graded and branded for sale in Greater Vancouver 40,818,462 lb. of beef. In the previous year nearly 39,000,000 lb. had been similarly dealt with. These figures cannot be compared with figures from other parts of Canada, unless we indicate the fact that in the year 1940 the *five Provinces* still grading beef under the voluntary system show a total of just over 13,000,000 lb. of red branded beef and 30,000,000 lb. of blue branded beef as being graded and offered to the consumer.

" There is the picture! One-half of the population of British Columbia, in the vicinity of Greater Vancouver, has access to a market provided with 40,000,000 lb. of graded beef, while the *rest of Canada* has a total of less than 44,000,000 lb. of graded beef available for purchase.

" During 1941 the sale of ' frozen beef ' has come up for consideration on a number of occasions, and in addition to this quality of beef being sold in butcher-shops for roasts, etc.,

the processing of graded beef by quick freezing has also provided an administration problem. However, at the beginning of February, 1941, the questions arising from this source are inconsiderable and the quick beef freezing outfit has passed out of business, and so far recourse to law has not been necessary to bring about a co-operative spirit on the part of those butchers and dealers who have featured frozen meats in their stores.

"Interest in British Columbia's beef grading venture has extended far beyond the confines of this Province. In Alberta, the Cattle Breeders' Association and the Western Stock Growers' Association have endorsed the beef grading policy and have indicated their desire to see the principle adopted in the Province of Alberta.

"In Saskatchewan both the Cattle Breeders' Association and the Stock Growers' Association have given the same endorsation, and in Manitoba the Cattle Breeders' Association has recently indicated its interest in and approval of this method of bringing about better conditions for the cattlemen and providing better beef for consumers.

"Besides the organizations mentioned, all pure-bred beef cattle clubs on the Prairies have endorsed the British Columbia 'Beef Grading Act' and asked that a similar Beef Grading Act be implemented in their respective Provinces.

"In December, 1940, at a meeting of cattlemen in Toronto, the British Columbia Beef Grading programme was thoroughly discussed. Copies of the British Columbia 'Beef Grading Act' and regulations were secured and an effort is now being made to devise some method whereby the producers of quality beef in the old Province of Ontario would secure a premium for high quality beef. It seems scarcely fair that a 16-year-old dairy cow which has given her life to the production of milk and butter-fat should be called upon to enter the beef trade when her age of retirement arrives.

"As pointed out at a meeting of the Western Canada Livestock Union in Vancouver in February, 1939, there was no difference of opinion between the packer and producer regarding the desirability of improving the marketing conditions and the earning ability of the producer and there appears to be no difference of opinion yet on the principle that any buyer, whether he be dealer or consumer, is entitled to the grade of beef that he buys and pays for.

"It is not claimed that beef grading alone has brought about the price improvement that obtains at the end of 1940 as compared with February, 1939, but the ranchers are receiving more money than before, and the farmers of British Columbia are receiving better financial returns for the alfalfa and the grain with which they are finishing their beef animals for the Vancouver meat market. Alberta cattle feeders are also benefiting under the British Columbia 'Beef Grading Act.'

"There are many other features of beef grading in Greater Vancouver that have been of benefit to producers and finishers of good cattle. With beef grading in effect, the standard of merchandising this product in Greater Vancouver has been raised to a much higher plane than it was previous to the inception of the Act, which has probably increased to some extent the sale of beef.

"While over 70 per cent. of the beef offered for sale in this city is in the three top grades, it means that a bigger percentage of good beef is sold and offered for sale in Vancouver than in any other city in Canada. From observation in other cities, the percentage of meat that would go into the top three grades would be just reversed, and be possibly about 30 per cent., if that much. People in the city of Vancouver are now 'grade conscious' and know how to buy under the simple grade definitions of A-1, A, B, C, D as readily as they do any other graded product which has been on the market much longer. And cow beef, being branded cow, together with C and D grades of steers and heifers, are not much in demand. In fact, the percentage of cow beef sold is just about the number of range cows from the ranges of British Columbia—no cows are wanted from other Provinces at all.

"Another remarkable improvement in marketing which was effected in British Columbia through beef grading, is the way the ranchers of British Columbia are now marketing their cattle, as compared with the way they marketed them previous to beef grading in that Province.

"It is some years ago that those ranchers in the Nicola area—for example, the Douglas Lake Cattle Company, the Guichon Cattle Company, Nicola Stock Farms, and others—changed their marketing procedure so that by heavy winter-feeding of hay (which they grew from irrigated projects they have developed) their steers and dry female end of the herds

could be marketed in a range beef condition, before the cattle marketings of the Upper Country and the slippy grass cattle from the Prairies started to move.

"The outfits mentioned are now, since beef grading became effective, grain-feeding a lot of cattle and their percentage of 'A' carcasses from grain-fed and grass cattle during the last two years has been considerable. In fact, a couple of the outfits mentioned have been selling their cattle more or less on rail grading.

"The Upper Country—Cariboo, Chezacut, and Chilcotin Districts—had never done anything in the way of winter-feeding except in getting their cattle through the winter on a short hay ration. In fact, their beef cattle were running in mountain ranges and came down as the cold weather developed, late in the fall, and all had to be marketed within a few weeks, when there were heavy shipments of cattle from Alberta going on to the Vancouver market; and this, as I mentioned before, glutted the market and broke the price.

"The cattle from that Upper Country owing to the short grass problem had for years been getting more into the feeder-cattle stage than the beef stage. There was also the custom of keeping steers to three and four years and when they got on the market they were big, horsey steers which, when beef grading came into effect, no one wanted. However, this beef grading policy has taught the ranchers in the Upper Country a lot about marketing and possibly the buyers for the Vancouver packing-houses brought this closer home to them as they got to the point where they would not buy anything off the range that would not grade.

"In this way the ranchers have rearranged their whole system, so to speak, and in most cases now have their beef herds on pastures that are accessible throughout the summer and where they are consistently topping off their beef herds in small shipments, weekly or bi-monthly, as the situation warrants. Most outfits are now selling their steers at 2 years old.

"In this way they are themselves getting the benefit of the market now that beef grading is in effect, and getting more out of their beef cattle than they were under the previous procedure.

"The 'Beef Grading Act' can add another point to its credit in connection with supplying beef to the armed forces within the Province. There were many complaints about the beef supplied to camps, and it was suggested there was one way to be sure that the armed forces got what it was intended they should get under the contract and that was to stipulate British Columbia Grade B beef. This was done, and it was probably welcomed by the processing industry. This means that the armed forces in British Columbia are getting beef of a *uniform quality* and better grade than any other Province in Canada.

"Before British Columbia had beef grading, it was customary for all the plain and medium cattle to go to Vancouver from Prairie points. In fact, these were the only cattle asked for. Now, orders for cattle wired from there to buyers or commission-men on the Prairies definitely state that nothing is wanted that will not grade 'B' or higher, and preferably higher. This has meant much to the feeders and finishers of beef cattle in neighbouring Provinces, for British Columbia now ranks among Alberta's best customers for live stock. Nearly 44,000 finished cattle went to the graded-beef area of Greater Vancouver from Alberta in 1940.

"Another very noticeable feature is that the trade is taking heavier carcasses than before beef grading came into effect. Prior to this time, of course, any light carcasses were being sold as baby beef, irrespective of finish. However, light carcasses that will grade are still in demand.

"The purchase of heavy carcasses is very noticeable in the two largest retail butcher-stores. When grading first came into effect, the buying range of weights was a minimum of 375 lb. and a maximum of 450 lb. The weight range at these stores at the present time is 475 lb. to 550 lb. and, with a little education, their branch stores will be in a position to handle 600-lb. carcasses. Carcasses of the latter weights are more numerous at all times than the very light carcasses and, at the weights the trade will now take them, it means that the market for well-finished 2-year-old cattle is developing.

"Many stores that were handling very low grade beef previous to beef grading have gone out of business altogether, and there are several stores that were in the low-class beef trade that are now handling nothing but Grade A beef.

"While there have been some small differences and complaints, on the whole, throughout this experiment, the co-operation of the majority of processors, retailers, consumers, and all concerned has been 100 per cent. All now accept beef grading as being here to stay and the

whole-hearted desire is that it will be continued, that the grading will be as consistent as humanly possible, and that British Columbia will continue to get its large percentage of high-class beef offered."

In preparing his statement, presented above, Mr. Byers has carefully studied the operations of beef grading within the area, has secured opinions of leading men in the beef trade, and has conferred with representatives of live stock organizations in the several Provinces. His views are considered to be fair to the industry, to the trade, and the Governments responsible for the policy.

AGRICULTURAL PRODUCTION COMMITTEE.

This committee was named by Hon. K. C. MacDonald on September 12th, 1939, and was given the task of co-ordinating agricultural effort in British Columbia with a view to securing maximum aid for Empire needs. The response of farmers and the public in general to our requests and suggestions has been highly satisfactory. Almost concurrent with the appointment of this committee was the formation at Ottawa of the Agricultural Supplies Board, the officials of which called a meeting at the end of September at Ottawa. This meeting was attended by the Chairman and the Secretary of the British Columbia committee.

Since that time two further such conferences were attended at Ottawa by the Chairman and Secretary. Opportunity was taken on each of these occasions to contact departmental officials at the Federal Capital with regard to Provincial problems, particular value accruing in connection with fibre-flax methods of production and seed supply, medicinal roots and herbs, flower and garden vegetable seeds, pork and pork products, eggs, and freight rates on feed grains. Excellent co-operation has at all times been received from the Agricultural Supplies Board and its officials.

A mailing-list based upon Farmers' and Women's Institutes, Agricultural Associations, and the daily and weekly press of the Province was circulated an average of once every two weeks with mimeographed bulletins dealing with timely topics. Bound copies of these circulars and data secured at Ottawa conferences retain in permanent form the information thus secured. The press of the Province has given much space to the information distributed and the Library, Department of Agriculture, Ottawa, has asked for a complete file of the committee's bulletins for reference and lending, with a further request that it be placed on the mailing-list for all future issues.

The committee has held many meetings, an average of one each week, and prepared and circulated twenty-seven bulletins, most of which were two- or three-page issues. Appended is a summarized account of its principal activities.

Pork and Pork Products.

Increased production of swine was suggested where with home-grown feeds this could be done economically, and a warning issued against any sudden attempt at increase in swine production without adequate preparation. Co-operation with the Federal Department of Agriculture's sow distribution policy in an arrangement whereby the Dominion and Provincial Departments of Agriculture jointly pay all transportation charges on sows from point of shipment to farmers who were members of a swine improvement association. One thousand brood sows have been distributed in the Province through this plan, in which every co-operation has been extended by officials of the Federal Department.

Freight Rates on Feed-grain.

The Chairman of the committee has had several interviews with high railway officials regarding this question. Since September 15th, 1939, approximately 1,850 cars of feed and feed-grain have been brought into British Columbia under C.F.A. Tariff 145 at a saving of $2 per ton.

Eggs and Poultry.

The committee made available a list of Flock Approval Plan Breeders as issued by the Poultry Branch that those interested in improving their strain might know where to procure new stock. In an effort to increase local consumption of eggs during a market glut in November, 1939, the committee prepared and distributed circulars dealing both with methods of preservation and new recipes for preparing and serving eggs.

Seed Production.

In co-operation with the British Columbia Seed Board, approval was secured for the purchase of certified and registered vegetable root stocks available in the Province and suitable for seed production.

Fibre Flax.

The committee investigated the possibility of developing the culture of this variety and through the co-operation of officials of the Dominion Experimental Farms at Agassiz and Ottawa and the University of British Columbia much has been accomplished toward the introduction of fibre flax as a commercial crop for which there is an Empire need.

The Chairman and Secretary recently visited flax-mills in Eastern Ontario and Quebec, where Maurice Soenens, a flax expert from Belgium, has a large flax-mill and the foundry manufactures for Canadian and export the latest flax-mill equipment. There Mr. Soenens maintains a school where fifty young men spend half their time learning the theory of flax culture and milling and half in practical work in the mills where deseeding, seed-cleaning, breaking, scutching, and hackling operations are carried on under expert supervision. The committee was fortunate, through the kindness of R. J. Hutchinson, Chief, Fibre Flax Division, Central Experimental Farm, Ottawa, in securing the use of a specially prepared flax film and samples of Agassiz-grown fibre flax in the various stages of preparation ready for shipment to Ireland to the account of the British Ministry of Supply. The Dominion Seed Board, which controls the fibre-flax seed sales, has been able to secure and set aside for British Columbia growers enough certified " Stormont Gossamer " seed of second generation from Ireland and grown under exceptionally favourable circumstances to sow 500 acres in 1941.

Without exception all the fibre-flax experts interviewed agree that the product grown in British Columbia is second to none and suggest that it can be used in the higher-priced trade.

Plans are under way to meet Farmers' Institutes in areas known to be suitable for fibre-flax culture to give information on the possibilities of this new crop and cultural methods.

Strawberry and Apple Crop.

To encourage use of these fruits the committee assembled a number of recipes and circularized the usual mailing-list. Through the courtesy and co-operation of the Extension Department of the Alberta Government, these were sent to every newspaper in that Province and much valuable publicity and good-will obtained thereby.

Medicinal Roots and Herbs.

A botanical advisory committee, composed of Dr. John Davidson, Professor of Botany, University of British Columbia, Chairman; Dr. Wm. Newton, Plant Pathologist, Dominion Experimental Station, Saanichton; and J. W. Eastham, Plant Pathologist, British Columbia Department of Agriculture, Vancouver, Secretary; with Dr. H. T. Gussow, Dominion Botanist, ex officio, has been named by the Hon. K. C. MacDonald for research-work and to give guidance to this committee in its recommendations. It is hoped that arrangements can be concluded to permit of the addition of a manufacturing druggist to this special advisory committee.

The matter of the production of Cascara (*Rhamnus purshiana*) bark was discussed with the Select Standing Committee on Agriculture, before which body this committee appeared and explained its work. On that occasion R. S. O'Meara, Director, Bureau of Industrial and Trade Extension, and F. S. McKinnon, Economist, Forestry Service, were present. The Forestry Branch has since undertaken a survey of the Cascara situation and to estimate the quantity available in relation to ordinary demands.

It is noted that digitalis plantings in the Victoria district have increased from 5 to 60 acres.

Many inquiries have been received from farmers interested in these possibilities, but the committee will review all material available very carefully before issuing definite advice.

The committee has contacted in Montreal and in London, England, herbal companies which are willing to quote prices on many ordinary products and some classed as weeds.

Over 1,000 of the committee's Circular 22-40 have been distributed. Rewrites have appeared in the leading farm papers of Canada and letters of inquiry from as far away as Newfoundland have been received.

Addresses on the work of the committee have been given before district and local meetings of Farmers' and Women's Institutes and Service Clubs on Vancouver Island and the Mainland. On three occasions these were illustrated with moving pictures.

The personnel of the Agricultural Production Committee is as follows: J. B. Munro, Chairman; Ernest O. MacGinnis, Secretary; James A. Grant, Member; George H. Stewart, Member.

SELECT STANDING COMMITTEE ON AGRICULTURE.

An opportunity was provided by the Select Standing Committee on Agriculture for members of the Agricultural Production Committee, the Fertilizers and Agricultural Poisons Board, the Feed Standards Board, the Provincial Seed Board, and the Advisory Board of Farmers' Institutes to meet with members of the Committee and discuss agricultural undertakings, achievements, and projects of particular interest at this time, when the production of foodstuffs and war materials occupies special attention.

The reports of the Select Standing Committee as presented to the Legislature on the 5th day of December are reproduced herewith for purposes of record and for the information of those who will peruse this report.

" Mr. *Putnam* presented the First Report of the Select Standing Committee on Agriculture, as follows:—

" ' REPORT NO. 1.

' LEGISLATIVE COMMITTEE ROOM,
' December 5th, 1940.

" ' MR. SPEAKER:

" ' Your Select Standing Committee on Agriculture begs leave to report as follows:—

" ' Your Committee, authorized by Resolution of the Legislative Assembly, dated November 4th, 1940, " to call members of the British Columbia Production Committee, the British Columbia Fertilizer and Agricultural Poisons Board, the British Columbia Feed Standards Board, and the Provincial Seed Board with a view to securing information on matters affecting the agricultural welfare of the Province, and to report its findings to this House," held five sittings.

" ' The Agricultural Production Committee, appointed by the Honourable the Minister of Agriculture in September, 1939, presented statements covering its diversified activities over a twelve-month period. In addition to stimulating agricultural endeavour, this Committee has undertaken extension programmes definitely beneficial to Canada and the Empire during the present crisis. Of particular interest is the arrangement made for the conservation of hides and pelts taken by hunters and ordinarily destroyed. The present programme provides for tanning of hides and pelts by farmers' organizations and donation of the product to patriotic organizations for war purposes.

" ' The Agricultural Production Committee has conducted correspondence and investigations that have culminated in the naming by the Honourable the Minister of Agriculture of an Advisory Committee on Medicinal Plants and Herbs. Cascara and other native and introduced species deserve and are receiving particular attention with a view to the establishment of a new industry long overdue in British Columbia.

" ' The possibility of developing fibre-flax production and a concomitant linen industry in this Province was outlined by the Agricultural Production Committee, which has assembled comprehensive data regarding fibre-flax varieties, suitable soil areas, proper cultural methods, economical processing, requisite machinery, and skilled labour for the fabricating of thread, cloth, twine, and fish-nets.

" ' The British Columbia Fertilizer and Agricultural Poisons Board this year recommended the reduction of fertilizer mixes from twenty-seven, as formerly approved, to fifteen mixes now legally offered for sale within the Province. This Committee early in the year prepared a booklet, " Fertilizer Recommendations," of which more than 10,000 have already been distributed to farmers and gardeners.

" ' The British Columbia Feed Standards Board reported to your Committee that its recommendations published in 1935 had been revised and reissued, and that this publication in improved form is available for distribution. This Board has also endorsed the recommendations contained in the revised bulletin, " Practical Poultry Feeding," now in the hands of the King's Printer.

"'The Provincial Seed Board informed your Committee on two important developments in the seed industry of British Columbia, which were:—

"'1. The co-operative arrangement entered into between the British Columbia Department of Agriculture and the Agronomy Department of the University of British Columbia whereby elite foundation seed of cereals and legumes and foundation tubers of certified seed-potatoes are being grown under careful supervision at the University Farm, Point Grey. The product of these foundation seed-plots is distributed through the Provincial Department of Agriculture to competent farmers in selected districts for multiplication and general dissemination within the Province.

"'2. Of paramount importance is the achievement recorded this year in the development of the vegetable seed industry in British Columbia. The European conflict, which has eliminated competition that formerly made local vegetable seed production a hazardous venture in this country, now makes it imperative that Canadian vegetable seed supplies be produced within the Dominion. British Columbia is admirably suited to undertake the responsibility to fill the Canadian demand and the Seed Board reports that advantage has already been taken of the situation by growers who are producing practically all needed vegetable seed varieties in considerable quantities of certified and registered grades.

"'Senior officials of the Provincial Department of Agriculture were also heard on matters relating to horticulture and animal production, transportation and marketing problems, and your Committee was informed that under the Federal-Provincial brood-sow distribution policy approximately 1,000 brood-sows and sires were placed with farmers during the year. Department statistics show the hog population has this year been increased more than 70 per cent. over that of 1939.

"'Your Committee was impressed with the comprehensive information presented by the members of the Agricultural Production Committee and by the members of the several Boards appearing at the sittings. Your Committee feels that its deliberations during the present Legislative Session have been unusually instructive and informative. There is every indication that the Agricultural Production Committee, the several Agricultural Boards, and the Provincial Department of Agriculture as a group are seized with the seriousness of the present world situation and the ever-increasing need for vigilance and diligence in maintaining agricultural efficiency throughout the Province.

"'All of which is respectfully submitted.

'FRANK PUTNAM, *Chairman.*'

"The report was read and received.

"Mr. *Putnam* presented the Second Report of the Select Standing Committee on Agriculture, as follows:—

"'REPORT NO. 2.

'LEGISLATIVE COMMITTEE ROOM,
'December 5th, 1940.

"'MR. SPEAKER:

"'Your Select Standing Committee on Agriculture begs leave to report as follows:—

"'Your Select Standing Committee on Agriculture, further authorized by the Resolution of the Legislative Assembly, dated November 4th, to consider such matters affecting the agricultural industry as may be laid before it by the Advisory Board of Farmers' Institutes, held one sitting with the Farmers' Institutes Advisory Board in attendance. A total of nine resolutions were presented by the Board dealing with the following matters:—

'(*a.*) Natural products marketing.
'(*b.*) School taxation system.
'(*c.*) Delinquent tax payment policy.
'(*d.*) Transportation rate on export eggs.
'(*e.*) Agricultural land clearing policy.
'(*f.*) Predatory animal bounties.
'(*g.*) Provincial Government farms.
'(*h.*) Reduced car licences.
'(*i.*) Revision of fishing regulations.

"'Resolutions (*a*) and (*c*) were entirely appreciative of the Minister of Agriculture's efforts and of Government policy. Resolutions (*b*), (*d*), (*e*), and (*g*) dealt with revenue and expenditure and have been referred to the responsible Departments for attention. The subject-matter of resolution (*d*) was thoroughly canvassed and it has been ascertained that the Department of Trade and Industry has capably represented the problem of export egg restrictions to Federal and shipping authorities. It is reported to the Committee that during the present fall season approximately 20,000 cases of British Columbia eggs have been removed from storage and shipped to Great Britain.

"'All of which is respectfully submitted.

'FRANK PUTNAM, *Chairman.*'

"The report was read and received."

FARMERS' INSTITUTES.

As indicated above, the Advisory Board of Farmers' Institutes met together in November of this year at Victoria at the call of the Honourable the Minister of Agriculture. Although 114 resolutions came before them for consideration, only nine were brought to the attention of the Select Standing Committee on Agriculture.

Annual District conferences were held in the ten Farmers' Institute Districts in which 214 Farmers' Institutes are carrying on their organized agricultural activities greatly to the benefit of settlers in the several communities. The District conferences were attended this year by the Honourable the Minister of Agriculture and by the Superintendent of Farmers' Institutes, except in two areas where the dates could not be conveniently arranged.

This year, owing to war conditions, Federal officials found it advisable to cancel licences held by Farmers' Institutes for the operation of stumping-powder magazines. This action, while working a hardship on settlers in many parts of the Province, was readily accepted by the Institute members who realized the gravity of the situation which necessitated cancellation of such licences.

By satisfactory arrangement with the British Columbia police, it is still possible for Farmers' Institute members to secure their necessary stumping-powder supplies. The Institute members and the police co-operate closely with representatives of the powder company and with Government Departments. The powder continues to be made available by the company at a reduced price and the Government rebate of $2 per case is available to any settlers up to a maximum of ten cases used within the fiscal year for land-clearing for agricultural production.

Purchase of pure-bred sires by Farmers' Institutes has been particularly heavy this year and the appropriation for this purpose has been completely exhausted. This required that further pure-bred sire purchases be deferred until after the beginning of the fiscal year at the beginning of April next. Farmers' Institutes almost without exception have readily made their instalment payments on pure-bred sires. However, it must be admitted that in one or two instances we had experienced difficulty in securing instalment payments when same are due. This delay on the part of individual Farmers' Institutes and their members reacts unfavourably against the pure-bred sire purchase policy in general.

In many parts of the Province, the Farmers' Institutes have shown renewed interest in local agricultural meetings. There has been a heavy demand for Institute speakers and for the use of the motion-picture project with films suitable for rural showing.

The following figures available for 1939 show the receipts and expenditures connected with the business turnover of 132 Farmers' Institutes which reported their business activities for last year:—

	Year 1939.	Year 1938.	Increase or Decrease.
			Per Cent.
Receipts	$254,144.53	$281,054.36	—9
Expenditures	232,586.61	257,095.94	—9
Assets	88,133.89	77,349.83	—14
Liabilities	22,431.18	22,600.76	—
Stumping-powder, fuse, and caps	49,706.77	53,970.52	—8
Seed, feed, fertilizer, etc.	112,586.16	135,128.99	—16
Miscellaneous	55,861.81	54,236.40	—3

The Department has continued its policy of paying 50 per cent. rebate on the delivery cost of Cyanogas and other poisonous materials used by Institute members in the reduction of gophers, marmots, and other burrowing rodents. This policy has not been made use of in 1940 to the extent of former years but some districts, particularly in the Upper Fraser Valley and in the Kootenays, still find they have need of Cyanogas and other poisons for the control of rodents which do considerable damage to growing crops.

It has been reported to the Department of Agriculture that badgers, which were added to the list of protected animals under the "Game Act" not a year ago, are showing signs of increase in some areas where they are most urgently needed for control of burrowing rodents.

Farmers' Institutes have been most active in organizing campaigns against pests of different kinds. The warble-fly control has expanded far beyond the expectations of those responsible for its inception eight years ago. The current year's Derris-powder purchases by this Department for warble-fly control is in excess of 1,000 lb. This Derris powder is used in the warble-fly areas in the Lower Fraser Valley, the Southern Interior, Central British Columbia, and the Peace River Block.

FEED-GRAIN IMPORTATIONS.

Under Canadian Freight Association Tariff 145 feed-grains, including wheat, oats, barley, mixed grain, screenings, and mill-feeds, have been imported in 1940 in quantity considerably in excess of the importations of previous years. Importations totalled 61,351 tons for 1940 as compared with 58,040 tons for 1939. The details covering both years are presented as follows:—

	1939. Tons.	1940. Tons.
Wheat	41,715½	39,011½
Oats	6,653½	3,683½
Barley	4,504½	11,679½
Mixed	302½	906½
Screenings	278½	490½
Mill-feed	4,585½	5,579½
Totals	58,040	61,351

IMPORTED HORTICULTURAL PRODUCTS.

With the approval of L. S. McLaine and H. F. Olds, the District Inspector in charge, a summarized report of the work undertaken by the Vancouver office for the year 1940 has been provided by A. J. Fuller, covering nursery stock and plant product inspections at Vancouver.

"The war has greatly disturbed the importations of nursery stock. From Holland, one of the chief sources of bulbs and ornamental stock in former years, there were only a few shipments this year. As a consequence the trade has been seeking new sources of supply, resulting in an increased movement of interprovincial shipments from points east of Winnipeg.

"All seed-stores, warehouses, mills, and elevators, where large quantities of seeds and cereal grains might be stored, have been made the subject of a special survey and, where any are suspected of harbouring stored products pests, the owners have been advised to take necessary clean-up measures. All seeds, cereals, and grains from all countries are also inspected.

"All ships carrying grain to the United Kingdom are now being thoroughly inspected and, if need be, fumigated or treated as required. In addition, the grain is inspected at the time of loading.

"In connection with the local bulb industry, work is being carried out by R. J. Hastings, of Saanichton. His advice to the growers is undoubtedly of great value in keeping their stock clean and improving the quality of the bulbs.

"The following surveys have been conducted by the Department under the supervision of H. F. Olds:—

"(1.) A further check on the pine-shoot moth infesting an area in the neighbourhood of South Granville Street in Vancouver disclosed the fact that the work done in 1939 was quite satisfactory. With the exception of one tree the district was found to be free of this pest.

"(2.) The San Jose surveys have been made in the Okanagan. Control measures are under the jurisdiction of the Provincial Horticulturist.

"(3.) Mr. Olds has also done some very interesting preliminary work in the Okanagan in connection with the Pacific mite.

"(4.) In co-operation with the Dominion Entomological Laboratory at Vernon, the Provincial Horticulturist and United States Federal Officers, a pear Psylla survey was made in the Southern Okanagan and the Kootenays. No evidence of the pest was found.

" In order to prevent the spread of the pear Psylla into Canada from Washington and Idaho, a temporary emergency arrangement has been made with the Customs Officers at the various border points whereby plant products from certain infested areas in these two States are refused entry into British Columbia if not accompanied by a certificate showing the origin of the produce as being from outside the present known areas of infestation.

" A series of short courses in plant diseases was held at the end of May in our laboratory, supervised by Dr. W. Newton. The courses were well attended by members of the Dominion and Provincial Departments of Agriculture.

" Early in May a trial shipment of twenty-five cases of oranges arrived from the Fiji Islands. The sugar content appeared to be high. The seeds, however, were large and numerous and this may prevent these oranges from becoming popular with the public.

" In August, 83,000 boxes of dried fruit arrived from Australia. According to reports, this shipment was from vineyards in a new area controlled by returned soldiers.

" In September, 1,120 tons of rice came in from Brazil. As far as can be remembered, this is the first shipment received at this port from that country. No onions have been exported to New Zealand this year.

" The following tables will show a marked reduction in the number of several varieties of nursery stock, both imported and exported, compared with previous years.

" Shipping News.

" During the year 2,063 deep-sea and coastwise boats docked at Vancouver. Thirty-nine brought nursery stock and 364 brought plant products as part of their cargo, shipped and transhipped from many parts of the world. We continue to meet all passenger and the majority of freight boats when they dock. The particulars of passengers with plants and plant products in the baggage is recorded below:—

" One hundred and sixty-three passengers on boats brought in the following as baggage: 12 assorted fruit-trees, 40 small fruits, 471 assorted ornamental shrubs, 5 rose-bushes, 48 assorted plants, 8 roots, 249 assorted bulbs, 43 floral Leis, and 3,509 lb. assorted fruit and vegetables.

" In addition, the following were condemned or prohibited entry:—

" *Condemned.*—3 fig-trees condemned for *Aspidiotus sp.* scales; 6 camellia shrubs condemned for *Aspidiotus camelliæ* and *ceroplastes sp.;* 1 olive shrub condemned for Olive scale; 1 Cydonia shrub condemned for San Jose scale; 19 Prunus shrubs condemned for *Aspidiotus forbesi;* 26 Azalea shrubs condemned for *Aspidiotus camelliæ;* 5 Gardenia shrubs condemned for *Lecanium nigrofasciatum;* 2 unknown shrubs condemned for unidentified scale; and 9 lb. oranges condemned for *Ceroplastes rubens, Lepidosaphes gloverii,* and *Pseudomidia duplex.*

" *Prohibited Entry.*—Regulation No. 4: Plants, 2; wood roses, 4. Regulation No. 12: Ornamental shrubs, 2; plants, 17. Regulation No. 18: Wheat, 10 lb.

" Imported Nursery Stock.

" A total of 1,041,883 assorted fruit-trees, ornamental shrubs, plants, bulbs, etc., in 2,217 containers, valued at $30,563.01, were inspected. This necessitated making 659 inspections. Owing to the war a great reduction in imported nursery stock will be noticed.

Assorted fruit-trees	11,819
Assorted small fruits	196,634
Assorted ornamental trees and shrubs	21,833
Roses	49,614
Fruit seedlings	138,700
Ornamental seedlings	9,913
Assorted plants	35,477
Assorted roots	54,412

Assorted bulbs	521,613
Bulblets (gals.)	2
Scions	1,868
Onion sets (lb.)	1,500
Peach pits (lb.)	4,766

" The countries of origin were chiefly the British Isles, Belgium, Holland, Ireland, Australia, New Zealand, and the United States of America.

" INTERPROVINCIAL NURSERY STOCK.

" Nursery stock imported into British Columbia from Provinces east of Manitoba and inspected by this Department:—

Assorted fruit-trees	541
Assorted small fruits	6,806
Assorted ornamental trees and shrubs	3,406
Rose-bushes	1,100
Fruit seedlings	41
Ornamental seedlings	557
Assorted plants	5,852
Assorted roots	9,094
Assorted bulbs	73,238
Onion sets (lb.)	36

" Eight hundred and seventeen shipments were inspected, consisting of 100,635 assorted plants, roots, etc., and 36 lb. of onion sets in 817 containers, valued at $4,843.54. This shows an increase over last year of 44 per cent. in shipments, 137 per cent. in quantity of nursery stock, and 91 per cent. in total value.

" Nursery stock imported into this Province from Manitoba and points west is taken care of by Mr. Eastham and Mr. Sandall.

" The following list of nursery stock was intercepted for insect pests and disease and destroyed:—

Plum-tree intercepted for root-gall	1
Grape vines intercepted for *Phylloxera vastatrix*	20
Lilium auratum bulbs intercepted for *Rhizopus necans*	159
Hyacinth bulbs intercepted for hyacinth yellows and bacterial soft-rot	39
Tigridia bulbs intercepted for bacterial soft-rot	54
Narcissus bulbs intercepted for basal rot	4

" Sixteen peach-trees and two five-needle pine-trees were intercepted and destroyed as they are prohibited entry under Domestic Regulations Nos. 6 and 3 respectively.

" INTERCEPTIONS, NURSERY STOCK, 1940.

Apple-trees intercepted for San Jose scale, *Bacillus amylovorus*	5
Pear-trees intercepted for San Jose scale, red spider	2
Cherry-trees intercepted for *Aspidiotus camelliæ, Aspidiotus forbesi*	24
Peach-trees intercepted for root-gall, sour-sap	10
Acer trees intercepted for *Aspidiotus camelliæ, Chionaspis forbesi*	213
Azalea trees intercepted for *Aspidiotus camelliæ, Gracilaria azalella*, mealy bug	104
Prunus trees intercepted for *Aspidiotus forbesi*	78
Malus tree intercepted for *Chionaspis furfura*	1
Olea shrub intercepted for *Aspidiotus camelliæ*	1
Camellia shrubs intercepted for *Aspidiotus camelliæ, ceroplastes sp.*	9
Holly shrub intercepted for *Aspidiotus camelliæ*	1
Euonymus shrubs intercepted for *Chionaspis euonymi*	5
Juniperus shrubs intercepted for *Diaspis carueli*	13
Unknown shrubs intercepted for *Chionaspis furfura*	10
Strawberry plants intercepted for *Heterodera marioni*	125
Assorted bulbs intercepted for eel-worm, basal rot, *Fusarium, Rhizopus necans*	681

"*Nursery Stock prohibited Entry into Canada.*

"Regulation No. 1: Peach-trees, 199; Prunus-trees, 50; Azalea, 50; Grape vines, 15; Strawberry plants, 150. Regulation No. 14: Peach-trees, 17. Regulation No. 17: Chinese Elm seedlings, 400. Regulation No. 18: Wheat, 10 lb.

"*Interceptions, Plant Products, January 1st, 1940, to December 31st, 1940.*

"Mexico: 100 lb. tomatoes condemned for *Heliothis obsoleta.*

"Barbados: Barley sample condemned for (1) *Sitophilus granarius,* (2) *Læmophloeus minutus,* (3) *Rhizopertha dominica,* (4) Parasites, (5) *Hemipterous nymph.*

"Many shipments of grains, cereals, dried fruit, and nuts were found infested with various stored products insects. These were fumigated and reconditioned when necessay and released after a second inspection."

IMPORTED EGGS.

In accordance with the "Eggs Marks Act," chapter 82, R.S.B.C. 1936, and amendments thereto, imported eggs and egg products entering British Columbia must conform to certain regulations as set out in the above Act. All imported eggs and egg products imported into the port of Vancouver have been submitted to the usual inspection and all requirements have been found fully complied with.

During the past year local supplies of eggs have been plentiful and all demands have been taken care of, consequently this market has proved unattractive to the imported product.

Imported eggs and egg products entering the port of Victoria are inspected and recorded by John Noble, Federal District Inspector at that port. These arrivals are reported by him each month to the Chief Provincial Egg Inspector, Court-house, Vancouver, B.C. The co-operation of Mr. Noble is much appreciated.

The arrivals reported during the year total as follows:—

Port of Victoria: 12 dozen eggs for hatching purposes from U.S.A. and 143 cases of salted eggs from China.

Port of Vancouver: 2½ dozen eggs for hatching purposes from U.S.A. and 379 cases of salted eggs from China.

The salted eggs imported from China are used solely by the Chinese residents in Canada for medicinal and flavouring purposes.

B.C. LIME COMMITTEE.

There have been abrupt changes in the Lime Committee's operations and personnel during the present year. Word was received from Ottawa that the Federal contribution toward lime transportation subsidies would be discontinued on March 31st. The withdrawal of Federal assistance did not alter the Provincial aid extended through the Lime Committee to purchasers and users of agricultural lime, because the Provincial Government assumed the full burden of this policy.

Early in the year, D. W. Thompson, the Chairman of the committee since its inception, resigned his position as an Inspector with the Dominion Seed Branch and at the same time tendered his resignation as Chairman of the Lime Committee. His counsel in committee meetings has been of value and it is regretted that the new work in which he is engaged is of a commercial nature that does not permit of his continuing as a member of the committee.

At the end of October, R. G. Sutton, District Agriculturist, who has served on the committee since it was first set up by the Honourable the Minister of Agriculture, resigned to accept a position as Farm Manager with the Provincial Secretary's Department at Tranquille, B.C. His place on the committee has been taken by his successor in the District Office, G. L. Landon.

Continuity of the work of the committee and of the payment of transportation subsidies on lime has been maintained through Dr. G. D. Laird, Secretary, who is now the sole remaining member of the committee as originally constituted.

From Provincial Government funds the Department continues to pay throughout a subsidy of 50 cents a ton on agricultural lime purchased and used by farmers in compliance with the Department regulations. During the present year rebates covering more than 2,000 tons of lime have been paid to approximately 160 applicants.

CAMPBELL RIVER FORAGE EXPERIMENT.

In 1939, acting under instructions approved by the Honourable K. C. MacDonald, Minister of Agriculture, an area of approximately 1,800 acres of burned-over, logged-off land in the Campbell River District of Vancouver Island was seeded to timothy and alsike clover mixed, sweet clover, white Dutch clover, and subterranean clover, between the dates of February 13th and March 24th.

Close check has been kept on the growth and latest inspection was made of the area on November 19th, 1940, by Lance Todhunter in company with Sperry Phillips, Assistant Field Crops Commissioner.

In the blocks seeded to subterranean clover it was noted with much satisfaction that the plants, which are an annual, had during the year made excellent growth. This was ascertained by the size of the several plants which at the time of inspection were still vigorous and bearing seed-burrs and from the amount of withered runners and seed-spikes that were in the plots. There is an increase of from 100 to 200 per cent. of young plants which at the time of inspection were vigorous and healthy in spite of very heavy frosts which had occurred in the area prior to our visit.

All plants had apparently survived the previous winter and it would now appear that this variety of clover is fairly well established.

The areas inspected in 1939 and which were not so promising are this year showing good results. There was a quantity of original plants in evidence and the number of young plants was most encouraging. In all plots the plants are extremely vigorous, notwithstanding the fact that they have been very heavily grazed by deer which are quite numerous in the vicinity of all parts that were seeded to clovers.

The catch of sweet clover is still disappointing, but there is evidence that some of the plants had survived and were bearing seed so that in another year better results may be looked for.

In all areas seeded to white Dutch clover the catch is extremely good, the plants apparently having come through the winter in good condition, were healthy and vigorous at the time of inspection, and it would appear that much reseeding had taken place as many young plants of good growth were noted. Here again deer appear to be quite numerous and are keeping the plants grazed short.

The area from Forbes Landing Road south which was seeded to timothy and alsike clover shows an excellent stand. The timothy was again 2½ to 3 feet in height with seed-spikes of from 2½ to 4 inches in length. The seed had scattered from the heads and new growth was very much in evidence.

Here there is now good grazing. There are a few cattle running in the area, but not sufficient to clear up the excess growth.

The clover which was seeded with the timothy is also in good condition and there is evidence of reseeding.

The area from Forbes Landing Road north to Elk Falls, which was seeded chiefly to timothy and alsike clover and which was so disappointing at the last inspection, has improved considerably, especially the timothy. Clover in this area, with the exception of the football field (where there is an excellent stand) does not appear to have improved during the year.

There were four test plots seeded in this part and where plants were difficult to locate in November of 1939 more recent examinations show that the plants, unnoticed at that time, had apparently yielded much seed and the stand at present is most encouraging.

From close inspection it would appear that the whole area will eventually become good range for cattle or sheep.

Also at this time a visit was paid to Hornby Island where an area of about 300 acres of burned-over land had been seeded to timothy and alsike clover. The seeding had been carried out only one month previous to our visit, yet at that early date there was evidence of good germination. The timothy was ¼ to ½ inch in height and there appeared to be a good catch of clover coming through.

Providing the winter is not too severe a good pasture should result from this seeding.

STAFF CHANGES FOR 1940.

On April 1st, 1940, superannuation became effective for Miss Emily Drummond, who had been absent from the Department on sick leave without pay from January 1st to March 31st.

H. E. Waby, District Agriculturist at Salmon Arm since 1923, applied for superannuation and was retired on April 1st, 1940.

Donald Sutherland, B.S.A., District Agriculturist at Kamloops, resigned on June 30th to enlist with the Rocky Mountain Rangers with which Unit he holds rank of 2nd Lieutenant. Mr. Sutherland was for ten years a District Agriculturist in the service of the Department.

On October 31st R. G. Sutton, B.S.A., resigned to accept the position of Farm Manager in the Department of the Provincial Secretary at Tranquille, B.C. Mr. Sutton was a member of the Extension staff of this Department since 1920.

Superannuation of J. A. Grant, Markets Commissioner since 1917, was asked for and took effect on November 30th. While Mr. Grant has retired from official connection with the Department of Agriculture he retains his place on the Agricultural Production Committee, where his services and experience covering a quarter of a century of close association with agricultural officials and directors of farm organizations is mutually beneficial to producers and administrators.

Owing to increased importance of seed production, particularly vegetable-seed production, a Field Inspector assigned to seed-production work was appointed on May 1st in the person of J. L. Webster, M.S.A., formerly employed in the Seed Branch of the Dominion Department of Agriculture.

Wm. MacGillivray was appointed District Agriculturist for the Shuswap-Columbia-Kootenay District, July 15th, succeeding H. E. Waby at Salmon Arm.

W. T. Carlyle, B.S.A., B.V.Sc., V.S., was appointed August 1st as District Agriculturist at Williams Lake, succeeding G. A. Luyat, who was transferred to Kamloops.

Miss Muriel Hawkes, temporary stenographer since December, 1939, was appointed to the permanent staff on October 1st as Stenographer in the Farmers' Institute Branch.

Ernest O. MacGinnis, formerly Secretary to the Honourable the Minister of Agriculture and Assistant Markets Commissioner, was appointed Markets Commissioner on December 1st, succeeding J. A. Grant.

Other permanent appointments as from April 1st, 1940, include John E. Porter, Clerk, Victoria; John A. Smith, B.S.A., District Field Inspector, Penticton; Miss E. E. Lyons, Stenographer, Penticton; Miss Helen Querns, Stenographer, Kamloops; and Miss G. C. B. Smedley, Williams Lake.

REPORT OF MARKETS BRANCH.

ERNEST MACGINNIS, MARKETS COMMISSIONER.

The marketing of British Columbia's 1940 fruit and vegetable crop was considerably restricted in some instances, notably export apples to Britain, and extended in certain vegetables such as potatoes, because of conditions directly attributed to the war.

The egg situation wherein Canadian storage stocks in 1936 were twice as great, and a year ago one million dozen more than in November, 1940, yet facing a weakening market, provided a problem for producers and the trade alike. Live-stock prices were also ruled by national trends. An intruding factor in both of these instances was the scarcity of lower-grade feed-grains on the Prairie because of the generally higher-grade crop harvested.

Lack of storage space for the Prairie crop and the consequent circumscribed marketing of the grain doubtless had its effect upon fruit sales in that area. Records show a larger quantity of fruit sold there than ever before, but was influenced, it is believed, by the continued stabilized deal now in effect on British Columbia tree-fruit.

The imposition of a 10 per cent. general tariff on United States imports and the 11 per cent. exchange had an effect upon general business conditions. It acted as a protection for the grower in the matter of importations and of assistance in exporting of which, within reasonable limits, advantage was taken. The export of two-thirds million boxes of apples to United States markets was made easier because of the exchange conditions prevailing, but the great incentive was a growing demand for the firm Northern grown apples.

MARKETING OF THE 1940 APPLE-CROP.

A comparative survey of the Canadian situation for 1939 and 1940 crops is interesting. The 1939 Canadian apple-crop was estimated at 17,000,000 boxes. Of this 7,400,000 were exported and processed, leaving 9,600,000 consumed as fresh fruit in Canada.

Because of the unfortunate wind-storm which caused so much loss to our sister Province of Nova Scotia and other adverse conditions there and in Ontario the 1940 Canadian apple-crop was reduced to 12,000,000 boxes. Of this approximately 1,000,000 boxes were exported, two-thirds to the United States and quite a proportion of the balance to South American ports. No permits for import of fresh apples were issued by the British Ministry of Supply. A stepping-up in consumption of fresh apples in Canada is observable, restraint in the imports of citrus fruits and higher purchasing power in industrial centres being contributing factors.

Under the authority of the " War Measures Act " and to compensate for losses of export markets and other restrictions, an agreement was entered into between the British Columbia Fruit Board and the Honourable the Minister of Agriculture of Canada conferring upon it exclusive right to market the apple-crop outside the Okanagan Valley, and wherein it was agreed that the Minister would pay the Board for a minimum of 1,750,000 boxes or the unpacked equivalent on an agreed schedule. Provision was also made for a pool for the equalization of returns.

The British Columbia Fruit Board designated Tree Fruits, Limited, its agent for the marketing of all the product coming under its control. A. K. Loyd is general manager and D. McNair sales manager of the growers' sales organization through whose efforts the increase has been made in domestic consumption.

The following figures for comparative dates at year ends demonstrates the apple movement for the last five years; the splendid response by the Canadian market for British Columbia apples during 1940 when the chief export markets were cut off is noteworthy.

Year.	Estimate.	(Canadian) Domestic.	Export.	Balance unsold.
1936	4,200,000	1,775,000	1,760,000	580,000
1937	5,250,000	1,725,000	2,120,000	1,315,000
1938	5,650,000	1,650,000	2,450,000	1,450,000
1939	5,480,000	1,590,000	2,100,000	1,640,000
1940	5,410,000	2,025,000	810,000	2,530,000

Whereas in 1939 the canneries took 150,000 boxes of apples, this season only 35,000 found this outlet.

APPLE-JUICES.

After years of research considerable advance was made in the use of cull apples for juice extraction. Prices as high as $6 per ton were paid for culls of certain varieties as compared with $1 which the grower formerly paid out for their disposal.

A number of plants in the Okanagan Valley, some new and others in operation previously, are now producing several attractive types of apple-juice which is finding increasing distribution as the virtues of this drink become known. Interesting results are being obtained from blending apple varieties in varying proportions before processing. Interesting experiments in blending apple with various berry-juices have been made by F. E. Atkinson at the Summerland Experimental Station.

A valuable by-product for dairy cattle in the residue is secured from at least one plant and is stated to have developed excellent results, replacing root rations satisfactorily.

STRAWBERRIES.

The 1940 strawberry season was a peculiar one as a result of unusual weather conditions in the growing areas. The first car was shipped from North Fraser on May 25th and the first car from the Island on June 3rd. Up until that time conditions had been ideal for the production of first-class fruit, but starting about June 1st night ground-fogs developed in certain areas with resultant mould. This came just before shipments reached their peak, and added to the high temperature at night when shipping was done ripened the berries rapidly and made the whole deal a difficult one to handle. This was particularly so with regard to the distribution of country cars. At that time your Commissioner was on the Prairies and examined strawberries in the cars and retail stores and until later could not understand arrival conditions, as the growth was normal when he left British Columbia.

The acreage was the largest ever harvested and if the weather had not broken an all-time high record would have been reached.

Import Strawberries.—(Value for duty applied May 16th.) Due to severe weather in United States producing sections, Louisiana and other early States started shipping later than usual and imports were considerably lighter in volume than for many years.

Express Rates to Eastern Canada.—Up until June 5th, 1940, car-lot rates were 17,000 lb. minimum, $4 per cwt.; 20,000 lb. minimum, $3.50 per cwt.

On June 6th car-lot rates, Mainland points to Eastern Canada destinations, were 22,000 lb. minimum, $3 per cwt.; 20,000 lb. minimum, $3.25 per cwt.

Direct L.C.L.s consigned to Jobbers and Retailers.—The situation was about the same as in previous years. One Japanese grower at Matsqui shipped Saskatoon 898 crates between May 30th and June 17th. The regular L.C.L. receivers on the Prairie had ample supplies; in fact, at one time in Calgary quite a large L.C.L. receiver had to wire his Coast connection to discontinue for some days as the market was so very badly congested they could not be handled by his firm, and cars, of course, at that time were in very heavy volume.

STRAWBERRIES—MAIN CROP.

Year.	Cars commenced.	Total Cars.	Average per Crate Net to Shipper.
1938	June 1st	201	$1.3079
1939	June 6th	158	1.37
1940	May 25th	180	1.3303

Total cars: North Fraser, 86; Matsqui and Chilliwack, 24; South Fraser, 49; Island, 4; Wynndel, 17.

RASPBERRIES.

Year.	Cars commenced.	Total Cars.	Average per Crate Net to Shipper.
1938	June 24th	66	$1.5067
1939	July 12th	39	1.6363
1940	June 20th	75	1.7270

Total cars: Lower Mainland, 64; Kelowna, 8; Wynndel, 3.

L.C.L.s were quite heavy from both the Coast and Kootenay sections. Direct L.C.L. operations were about the same as last season. The Coast L.C.L.s ran 400 to 1,200 per day from June 24th to the end of August. L.C.L. raspberries were heavier than L.C.L. strawberries.

EVERBEARING STRAWBERRIES, 1940.

Year.	Cars commenced.	Total Cars.	Average per Crate Net to Shipper.
1938	July 23rd	45	$1.4407
1939	Aug. 2nd	45	1.4069
1940	July 17th	17	1.8736

The long, dry, hot spell of about five weeks, which evidently affected other berries, dried up the plants and reduced the volume.

POTATOES.

The marketing of potatoes under the control of the B.C. Coast Vegetable Marketing Board has reached very high volume and returned reasonable prices to the producers. The Board was able to make arrangements to sell the supplies for His Majesty's Forces direct from the Agency, an arrangement which seems to be working out very satisfactorily. Exports to the Prairie markets were restricted to early varieties only, as the crop there was in quantity this year. Storage (farm) on Vancouver Island and Lower Mainland are estimated

to be twice as many now as at the 1939 year end, which was brought about by increased acreage and a 20 per cent. estimated larger yield. The yield in Alberta was up 50 per cent. on a slight acreage increase.

The B.C. Interior Vegetable Marketing Board ended the year with satisfactory volume of business. Potato stocks in farm storage estimated about 150 cars. Prices throughout maintained a fair level.

It is estimated that the farm storage potatoes in the Province will be ample to take care of requirements.

STONE-FRUITS.

From inspection trips to the Prairies and conversation with officials engaged in the marketing of stone-fruits, it is evident that a good reception was accorded British Columbia stock this year. In some areas a reduction for various reasons in receipts of imported soft fruits was another feature favouring a highly successful movement.

PACK OF PROCESSED FRUITS.

Unlike the 1939 season, when the export of this commodity netted the grower as much or more than did the fresh-fruit market, 1940 ended with most of the stock of processed berries still on hand. Lack of import certificates from the British Ministry of Supply, though assurance was given that this would be forthcoming, was responsible for this condition.

Many conferences were held and the matter was taken over by the Bureau of Industrial and Trade Extension. As will be noted from the statement following 500,000 lb. were exported to Eire in the hope that they might be shipped across the channel when Atlantic bottoms were less available.

Product.	SO_2.	Frozen.	Total.
Lower Mainland.			
Apples	125,795	.....	125,795
Apricots—			
Okanagan	35,025	.....	38,713
United States	84,774	.....	84,774
Blackberries	231,883	23,153	255,221
Black currants—			
Okanagan	.....	10,672	19,621
Lower Mainland	69,249	9,913	280,978
Blueberries	.....	5,000	5,000
Boysenberries	6,533	1,000	7,533
Cherries—			
Okanagan	528,000	.....	528,000
Vancouver Island	.....	.....	2,229
Lower Mainland	252,500	1,617	257,813
Crab-apples, Okanagan	39,845	.....	39,845
Citron melon	50,000	.....	50,000
Damsons	7,854	.....	7,854
Gooseberries	66,943	1,125	68,068
Grapes	27,961	.....	27,961
Greengages	30,822	.....	30,822
Loganberries	437,033	30,779	468,782
Peaches—			
Okanagan	104,526	.....	105,514
United States	3,000	.....	3,000
Plums—			
Okanagan	13,326	.....	13,326
Lower Mainland	72,821	.....	74,546
Prunes—			
Lower Mainland	36,875	.....	43,949
United States	179,372	.....	179,372
Raspberries	1,272,673	607,422	1,882,495
Red currants	9,582	6,393	15,975
Rhubarb	25,274	.....	25,274
Everbearing strawberries	48,783	12,000	58,783
Main crop strawberries	3,831,259	36,551	5,040,815
Zucca melon, Okanagan	33,342	.....	33,342
Oranges, United States	38,679	.....	38,679

N.B.—Main crop strawberries, 803,075 in 2 x 1 and 368,930 in 3 x 1.

PACK OF PROCESSED FRUITS—*Continued.*

Product.	SO_2.	2 x 1.	3 x 1.
Vancouver Island.			
Apples	18,480	.....	.....
Apricots (imported)	16,000	.....	.....
Blackberries	6,874	.....	.....
Black currants	6,321	.....	.....
Cherries	9,228	.....	.....
Gooseberries	1,920	.....	.....
Loganberries	18,000	.....	500
Peaches	12,000	.....	.....
Plums	14,650	.....	.....
Raspberries	.....	.....	1,000
Strawberries (main crop)	82,250	3,380	6,080

PROCESSED FRUITS EXPORTED, LOWER MAINLAND.

	Great Britain.	Eire.	Eastern Canada.	South Africa.	Singapore.	U.S.A.	Total.
	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.
SO_2 strawberries	24,850	542,540	.....	15,750	.....	.....	583,140
SO_2 raspberries	.....	95,800	322,400	15,600	.....	.....	433,800
SO_2 black currants	.....	52,983	.....	.....	.....	3,690	56,673
SO_2 loganberries	.....	.....	10,000	.....	.....	.....	10,000
Frozen strawberries	.....	.....	.....	.....	6,000	.....	6,000
Frozen raspberries	.....	.....	192,605	.....	.....	.....	192,605
Frozen black currants	.....	.....	22,965	.....	.....	.....	22,965
3 plus 1 strawberries	.....	.....	225,047	.....	.....	.....	225,047
SO_2 orange-pulp	.....	17,630	.....	.....	.....	.....	17,630

RHUBARB.

Forced rhubarb to the extent of approximately twenty cars was shipped to the Prairies during winter months and prices realized were about the same as the previous year.

Field rhubarb marketing, through its federation, faced new conditions, one being the increasing supply of Prairie-grown stocks which took care of much of the local demands after the middle of May. The average price per crate was down about 1 cent per crate and eight more cars—fifty-nine—than in 1939. For various reasons the season may be considered to have been a difficult one.

Year.	Cars commenced.	Ended.	Cars shipped.	Average per Crate.
1937	April 13th	June 3rd	73	$0.876
1938	April 12th	May 23rd	63	0.7428
1939	April 14th	May 26th	51	0.7769
1940	April 5th	May 28th	59	0.767

A change in the commissionership took place this year at the end of November when, after almost a quarter of a century of service with the Department, J. A. Grant retired on superannuation. During that twenty-five years the apple industry had developed from the point where it was not even a factor in export to Prairie markets, until to-day when British Columbia apples are found in all the major Canadian cities and half the total production normally goes export to Empire and foreign countries.

During that period Mr. Grant visited Europe and all the States in the United States in search of markets and marketing methods. These and other efforts have had a substantial effect upon the expansion of the industry.

As noted in last year's report an Assistant Commissioner had been appointed early in 1939 to become familiar with the work of the Branch.

The Markets Bulletin is published every week and during the year a number of requests were received to have names added to its mailing-list. Bound copies of this bulletin have proved of value during the year as a source of information in tracing market trends from year to year.

Contact with the Prairie market was maintained by the usual trips as far as Winnipeg when conditions were reviewed through actual contact with officials.

REPORT ON SOIL-SURVEYS.

C. C. KELLEY, B.S.A., OFFICER IN CHARGE.

Field activity during the summer of 1940 included a detailed soil-survey of seven landing-fields for the Department of Transport. The main work was continuation of the soil-survey of the Central Interior. The total area classified in 1940 amounts to about 111,955 acres.

AIRPORT SURVEYS.

Soil classification of the Sea Island, Langley Prairie, Hope, Princeton, Boston Bar, Kamloops, and Prince George airports was undertaken in late May and early June; covering a total of about 1,125 acres.

The need for soil classification on landing-fields is related to the selection of sites without regard for soil quality, and the subsequent exposure of unproductive subsoils by levelling operations. An additional feature in this Province is the variety of climates in which fields are located. The climatic variation creates a demand for different soil treatment under the several moisture conditions.

When conditioning airports for use the production of a good turf is often a serious problem. A surface thinly covered with grass or weeds, or bare ground, can be dusty or slippery, depending on the soil texture and the weather.

Unsatisfactory soil conditions at the surface are mainly produced by the exposure of subsoils when the fields are levelled. Subsoils are fine textured and coarse textured. Failure of exposed fine textured subsoils to produce a turf is generally due to soil poverty which can be ameliorated by use of the proper amendments.

Where coarse textured subsoil materials have been exposed by grading, there is a combination of soil poverty and drought which inhibits the development of a satisfactory turf. Top-soiling or artificial surfacing is necessary where the exposed surface is coarse textured.

A soils map and report describing the conditions on each landing-field was produced during the field season and distributed in October.

CENTRAL INTERIOR SURVEY.

Reconnaissance soil-survey work was continued in the Prince George District for a period of four months and two weeks, and land classified in this time amounts to about 110,830 acres.

The main area in which work was done lies west of the Fraser River, between the Nechako River on the north and the Cariboo electoral boundary on the south; with West Lake and the old Blackwater Road as the temporary western boundary. Smaller areas were surveyed between Shelley and Willow River to the west of the Willow River Road, and in the Salmon River Valley.

In a total of 110,830 acres the potentially arable soils amount to 40,719 acres and sub-marginal lands cover about 70,110 acres. In the potentially arable land category about 415 acres is or has been cultivated. The area contains 55 miles of gravelled and partly gravelled roads and about 42 miles of wagon-trails.

For development purposes the forest cover has been separated into heavy and light clearing in addition to the differentiation of soil types. Heavy clearing refers mainly to the spruce forest and light clearing identifies the deciduous trees and shrubs that grow up after the spruce forest has been destroyed by fire. Potentially arable soils under the heavy forest cover are regarded as unsuitable for settlement at the present time, owing to the high reclamation cost. Potentially arable soils in the light clearing division are the most

suitable for present use. The area of light clearing on the 1940 map-sheet in potentially arable land amounts to 27,775 acres and heavy clearing to 12,944 acres.

The total area classified in three years, 1938–39–40, now contains about 357,271 acres. In this total about 216,391 acres are potentially arable and 140,880 acres are submarginal for agriculture. Total land brought to a stage of cultivation within the mapped area amounts to about 7,890 acres.

In the total of potentially arable land, light clearing covers about 109,345 acres and heavy clearing 107,046 acres. The separation of light from heavy forest cover on soils technically arable serves to show that 109,345 acres are suitable for consideration in any settlement scheme. On the other hand the balance of approximately 107,046 acres should be reserved from settlement until the forest had been logged and burned, or until some future time when land is in great demand.

The general plan of soil-survey followed in the Central Interior includes the practice of classifying all lands that were land surveyed in the early days of the district.

The Provincial Reference Map used as a base for soil-survey field-work lacks contours and many other features that should be regarded as essential for any programme of land settlement. In order to supply the most accurate and detailed information as to topography, forest cover, roads, trails, etc., an aerial photographic survey is necessary.

At present the surveyed area in the vicinity of Prince George has the form of a rectangular block from 12 to 15 miles wide and about 54 miles long, extending from the electoral boundary near Woodpecker to Summit Lake. When completed this block will probably form the basis for the publication of a soils map and report covering a comparatively small section of the potentially arable region in the Central Interior.

HISTORY OF THE PRINCE GEORGE DISTRICT.

The country tributary to Prince George has a long history punctuated with hope and frustration. A short review of some of its main events serves to show the importance of the region and to throw some light on past difficulties surrounding agricultural development. Such information is often available from a local source, and due acknowledgment is made for the loan of old files by the Prince George " Citizen."

Alexander Mackenzie was the first European to pass through the Rocky Mountains into the district and also the first overland traveller north of the Gulf of Mexico to arrive on the shores of the Pacific.

As an explorer for the Northwest Fur Company, he left Fort Chipewyan in October, 1792, ascending the Peace River until freeze-up and wintering there with his party. On May 9th, 1793, the voyage was resumed. He continued up-stream on the Peace River to the Forks of the Findlay and the Parsnip, and the Parsnip was followed to its source in Summit Lake. From Summit Lake he crossed to the great river called Tacoutche and Jackanut by the Indians and later named the Fraser. The expedition then floated down-stream for five days to a point where Fort Alexandria was located twenty-eight years later. From there he made an overland crossing in sixteen days, reaching the Pacific near Bella Coola on July 22nd, 1793. Mackenzie returned to Fort Chipewyan by approximately the same route, after an absence of about eleven months.

After a conference at Fort William in 1805 to discuss the advisability of extending the operations of the Northwest Fur Company west of the Rockies, Simon Fraser came to Central British Columbia by way of Lake Athabasca and the Peace River. After following Mackenzie's route to Summit Lake he descended the Fraser to the mouth of the Nechako. He turned west up the Nechako and ascended the Stuart River to Stuart Lake, where he established Fort St. James. He then explored Fraser Lake, where he also established a post, and wintered at Fort St. James. In 1807, the following year, he established Fort George on his voyage down the Fraser River. Simon Fraser named the whole district New Caledonia and Fort St. James became its capital.

From this time onward the country became a fur-trading territory and Fort George figured largely in further explorations. Hopes for development of the district were high during the C.P.R. surveys, which were made from 1871 to 1884. Some of these surveys were run through Fort George. After location of the route through the Selkirk range, however, the Central Interior fell back from its railway expectations until 1907, when surveys were

made preceding the construction of the Grand Trunk Pacific Railway, this road being completed around 1915.

The construction of the Pacific Great Eastern Railway was planned in 1912 and steel was laid about 15 miles north of Clinton by 1916, when work was stopped. In 1918 the railway was taken over by the Government and on July 26, 1921, the track reached Quesnel. Although the grade was completed to Prince George and some track was laid, the P.G.E. was never operated north of Quesnel.

Between 1910 and 1916 interest in the land was keen. This stage occurred during the northward building of the P.G.E. and the westward construction of the G.T.P. Most of the land in the vicinity of Prince George was purchased by companies and private individuals in anticipation of great expansion when the railways were built. The Government sold lands and timber as a source of revenue, and in the ten years previous to 1914 land-sales in the Province had amounted to about 5,250,000 acres. The large expenditures that were made for roads, trails, bridges, and for the advancement of railway construction would have been impossible at that time without the sale of natural resources.

The result of this boom was the accumulation of large blocks of the most accessible lands in Central British Columbia by speculators and companies who were unable to dispose of their holdings at a profit or at a price that could be paid by prospective settlers. The tendency of absentee owners under these conditions was to withhold their lands from sale in the hope of a better deal in the future. The inability of prospective settlers to secure these lands at a price they could pay eventually caused a change of public opinion to an attitude less favourable to the absentee owners, and pressure was brought to bear on the Government to increase wild land taxation and in other ways to make lands available to the prospective settler. By 1919 this reversal of opinion was complete and the newly formed Land Settlement Board was acquiring blocks of land to be resold at low prices. Government farm loans were also made available to selected farmers for the development of their properties.

The changed policy caused a certain stimulation in land settlement, which received further aid by generous provision for the employment of settlers at road-building and tie-making. However, proper consideration was not given to the fact that it is an almost hopeless task for a man without capital to clear land with an axe and earn a living at the same time.

The final product of these policies in the Central Interior has been a few successful farmsteads and some rather hopeless attempts to develop farms. These attempts have the form of a large number of scattered clearings which range from 5 to 20 acres in area. The mean average result is about 10 acres cleared and cultivated before the lands were abandoned or before further attempts to clear lands ceased to be operative.

In a district where 80 to 100 acres of cleared and cultivated land should be the minimum requirement for a family unit, the 10-acre average product is sufficiently striking to prove that the policy, rather than the human factor, was inadequate.

These observations, based on the present survey, force the conclusion that any settlement scheme entered upon in future should be preceded by research as to the feasibility of clearing land for settlers by efficient modern methods. It should also include research as to provision for a farm water-supply and plans for volume production of commodities that will find a profitable market.

GENERAL.

During the field season the glacial lake clay deposits which form the main part of the potentially arable land area in the Central Interior were traced westward to Fraser Lake. It would thus appear that a glacial lake or lakes existed at one time between Fraser Lake and Prince George, the Babine and Rocky Mountain glaciers making contact at the latter point. To the east and for a few miles to the north of Prince George there is a region of morainal (non-agricultural) topography now thought to be the debris from an invasion of the Rocky Mountain Glacier. In this connection acknowledgment is made to Douglas Lay, Department of Mines, for valuable information regarding the Pleistocene history of the various soil parent materials. An estimation of the average width of these deposits between Fraser Lake and Prince George, however, will require further reconnaissance-work.

Another project entered upon during the season and still incomplete is an ecological study of the forest zone which covers the Central Interior region. This work was undertaken

by E. W. Tisdale, Dominion Government ecologist, and when completed it will permit an ecological and climatic comparison with northern settlement regions in other sections of Canada.

Total lands soil-surveyed by this Branch in British Columbia now amount to about 1,386,955 acres, 545,000 acres of which have been disposed of in the form of a published report. During the winter of 1940–41 work continued on a soil-survey report describing the Okanagan Valley. When completed and published this will account for about 435,000 acres of the unreported area.

REPORT OF THE PUBLICATIONS BRANCH.

J. S. WELLS, PUBLICATIONS CLERK.

During the year 1940, the Publications Branch, Department of Agriculture, Victoria, received 3,565 letters requesting agricultural literature and sent to residents of British Columbia a total of 49,118 bulletins and circulars (9,000 more than last year). The greatest demand was for the bulletin called, " Fertilizer Recommendations," edited by the British Columbia Fertilizer and Agricultural Poisons Board, 10,037 copies of which were sent out. Next came Dairy Circular No. 40, " Some Causes of Variation in Percentage of Fat in Milk," 2,622 copies leaving this office. This was a new circular printed by the Dairy Branch. Again, as usual, a great demand was for Bulletin No. 83, " Preservation of Foods," and also for Horticultural Circular No. 60, " Pruning of Fruit-trees."

This year, our office mimeographed 74,885 stencils on different agricultural subjects. The Agricultural Production Committee sent out a weekly stencil totalling 18,195 in a year. Next came the Live Stock Branch with stencils amounting to 12,735.

The following is a list of publications printed during the year 1940:—

Bulletin No. 26, Practical Poultry-raising.
Field Crop Circular No. 14, Farm Drainage.
List of Publications.
Thirty-fourth Annual Report, 1939.
B.C. Fertilizer Board Bulletin.
Horticultural Circular No. 42, Top-working of Fruit-trees and Propagation.
Dairy Circular No. 40, Some Causes of Variation in Percentage of Fat in Milk.
Climate of British Columbia, 1939.
Dairy Circular No. 39, Certified Milk and Butter-fat Records.
Poultry Circular No. 27, Breeding Stock Hints.
Poultry Circular No. 33, Management and Rearing of Guinea Fowls.
Poultry Circular No. 32, Fattening Young Ducks.
Horticultural Circular No. 55, Raspberry Culture.
Horticultural Circular No. 56, Currant and Gooseberry Culture.
Poultry Circular No. 25, Hints on Egg Hatching.
Horticultural Circular No. 63, Grasshopper-control.
Agricultural Statistics Report, 1939.
Horticultural Circular No. 37, Imported Cabbage-worm.
(Cabbage Seed) Circular No. 1.
(Spinach Seed) Circular No. 2.
(Cauliflower Seed) Circular No. 3.
Circular No. 50, Exhibition Standards of Perfection for Fruit, Vegetables, and Field Crops.
Fruit Spray Calendar.
Circular No. 53, Feeding of Farm Live Stock in British Columbia.
Horticultural Circular No. 71, Dust Sprays.
Horticultural Circular No. 58, Strawberry Culture.
Horticultural Circular No. 64, Varieties of Fruit Recommended for Planting in British Columbia.

A number of publications for some time out of print are being revised. At present copy is in the hands of the King's Printer for Bulletin No. 107, " Practical Poultry Feeding." This bulletin will be ready for distribution early in the new year.

"Feeding of Farm Live Stock," a pamphlet prepared by the Feed Standards Board in 1938, has been revised and is being reissued in improved form. Copy for this publication is also in the hands of the King's Printer.

REPORT OF HORTICULTURAL BRANCH.

W. H. Robertson, B.S.A., Provincial Horticulturist.

From a horticultural standpoint weather conditions during the past year have been most satisfactory. The winter was the mildest experienced throughout the Province for a number of years. In the fruit and vegetable producing sections no low temperatures were recorded and while the snowfall in the Interior was light there was a satisfactory rainfall in all areas. The spring was much earlier than in 1939. The summer was hot and dry and many sections of the Interior experienced a shortage of irrigation-water. The heat and lack of moisture extended into the early fall. In the late fall there was ample moisture but, on the whole, weather conditions were excellent for the harvesting of fruits and vegetables. No frost or snow was recorded until early in November, and during the last two months of the present season there have been heavy rains in the Coast areas with rain and snow in the Interior. On the whole, ground moisture conditions in the Coast sections are satisfactory for this time of year, although somewhat below normal in the Interior.

HORTICULTURAL CONDITIONS.

Tree-fruits.

Tree-fruits in all sections came through the winter in excellent condition. The estimated production of apples is, however, lighter than in 1939, due not only to hot, dry weather during the summer period but also to the heavy infestation of codling-moth in many orchards. A considerable reduction has also been effected through non-picking of certain varieties, necessitated by the lack of export to the British market. Large quantities of apples were used by the canners as well as by the manufacturers of apple-juice. This last product is making its appearance on the market in increasing quantities each year. Pears were also a light crop, but of good quality. Stone-fruits such as prunes and cherries were also lighter than the crop of last year. Both, however, were of excellent quality and marketed as they were under satisfactory climatic conditions, particularly in the Interior, the returns to the grower were better than in 1939. The production of peaches and apricots was slightly larger than the crop of last year.

Some idea of the production of tree-fruits in the Province may be obtained from the following table, which shows the actual production for 1939 and the estimated production for 1940:—

Fruit.	1929 Production.	1939 Production.	Estimated 1940 Production.
*Apples (boxes)	3,488,558	6,208,261	6,098,430
Crab-apples (boxes)	123,609	131,798	132,130
Pears (boxes)	162,811	355,484	342,580
Plums and prunes (crates)	383,275	619,301	465,600
Peaches (crates)	135,964	530,972	580,475
Apricots (crates)	100,532	177,149	192,225
Cherries (crates)	174,118	263,144	184,085

* The above apple estimate was made in August. The present indications are that the actual production figures will be close to 1,000,000 boxes less than the estimate as shown.

Small Fruits.

Due to a very early spring all small fruits were on the market earlier than in the previous year. While the early indications were for a heavy crop, the continued dry weather following the opening of the strawberry season not only materially shortened that crop but also curtailed

the production of raspberries, loganberries, etc. Prices of strawberries in practically all districts were slightly lower than those of last year, while raspberries were about the same as in 1939. Loganberry prices on the whole were slightly higher. For canning and dehydrator fruit the price of loganberries was low but the wineries took a larger tonnage than in the past at a price of 6 cents per pound, thus bringing up the average.

All small fruits have gone into the winter in very good condition. Furthermore, the carry-over in strawberries may be sold at an early date. If such is the case, and with a satisfactory winter and no carry-over, it should be possible to dispose of the 1941 crop without great difficulty.

The following table shows the estimated production for 1940, in comparison with the actual production in 1939 and 1929:—

Fruit.	1929 Production.	1939 Production.	Estimated 1940 Production.
Strawberries (crates)	391,617	814,480	797,600
Raspberries (crates)	180,867	257,066	248,700
Blackberries (crates)	52,147	39,837	47,100
Loganberries (lb.)	1,604,189	2,061,115	2,199,000
Gooseberries (lb.)	167,195	337,602	343,250
Red and black currants (lb.)	335,886 (1930)	871,678	693,400
Grapes (lb.)	296,104	1,595,902	2,300,000

VEGETABLES.

The following table shows the estimated acreage of some of the principal vegetable crops, in comparison with the 1939 acreage:—

Kind.	1939 Estimated Acreage.	1940 Estimated Acreage.
Tomatoes	2,360	2,772
Onions	1,554	1,060
Lettuce	598	575
Celery	331	332
Cucumbers	161	175
Cabbage	531	531
Cantaloupes	255	290

The tomato acreage shows an increase. The season was favourable for the production of this crop and with better canning prices the returns have been very satisfactory. The onion acreage was smaller than in 1939 and the yield was reduced materially, due to hot weather and the presence of onion-thrip. The quality of the crop, however, was good and the prices better than those of last year.

Asparagus acreage shows an upward tendency, the largest acreages being in the Okanagan and Fraser Valley Districts. The following table shows the increase in acreage of this crop during the past ten years.

Asparagus Acreage, 1930–40.

District.	1930.	1932.	1934.	1936.	1938.	1940.
Vancouver Island	22	22	30	35	32	40
Fraser Valley	56	136	106	163	208	210
Salmon Arm	.....	9	13	25	34	53
Clearwater	28	.....	1	1	1	2
North Okanagan	.....	171	204	237	222	221
Kootenay and Boundary	5	5	10	14	18	22
Total	111	343	364	475	515	548

Greenhouse vegetable crops such as tomatoes and cucumbers show a slight increase. This is particularly true in the case of tomatoes. In the case of this crop a marked increase is noted in the Northern Okanagan where many Japanese are increasing their greenhouse production.

On the whole there is an upward tendency in the production of vegetables throughout the Province, particularly of the early spring and late fall crops. The climate of British Columbia is well adapted to the production of such crops, both for the home market as well as for export to the Prairie and Eastern markets.

Bulb Production.

As shown in the report of the branch for 1939, the flowering bulb acreage in the Province has increased approximately 62 per cent. in the last ten years. Acreage and production would, however, have increased much more rapidly during that period if producers had been assured of a satisfactory market. Due to war conditions during the past year the European source of supply was to a large extent eliminated. The result was that our producers were able to find a good market for all bulbs they had available for sale, and at most satisfactory prices. This has led to more extended plantings during the past fall. Although there is likely to be a larger quantity of bulbs available in 1941 than at any time in the past, growers should keep in mind that in order to build up a permanent market only bulbs should be sold that have been thoroughly cured and properly graded.

Tobacco.

The tobacco-producing acreage of British Columbia is found in the Sumas area of the Fraser Valley. Approximately 400 acres, about 90 acres more than in 1939, were planted in 1940. G. E. W. Clarke, District Horticulturist, in whose district this planting is made, reports as follows on this crop:—

"The summer was warm and dry, consequently it was necessary to irrigate and as a result a very favourable yield and quality of Virginia Leaf flue-cured tobacco has been harvested.

"This year an Eastern company sent a buyer to purchase the crop and, while delivery has not been made, the growers expect to receive payment on between 475 to 500 thousand pounds at a price of 20½ cents a pound. Indications are that the quantity sold and price received will be on the average better than in past years. Dry cold weather about the middle of November interfered with the rapid baling and shipping of this crop."

Hops.

The principal hop plantings are in the Fraser Valley. The following report on the hop plantings in that area is taken from the report of G. E. W. Clarke, District Horticulturist:—

"There are over 1,300 acres of hops grown in the Chilliwack, Sardis, Sumas, and Agassiz Districts, and in addition there is approximately 150 planted in small holdings of less than an acre and up from Pitt Meadows to Dewdney on the north side of the Fraser River and to some extent on the south side of the Fraser River. The majority of these growers are Japanese who are trying to supplement the growing of small fruits, and operating co-operatively as 'The Western Canada Hop Growers Association.' This season was the first year of production for about 40 acres planted in 1938 and, in spite of inexperience and a rather difficult season, yields and returns for the crop have apparently been slightly better than expected.

"The large hop acreages experienced a rather hard year and arrangements had to be made to irrigate a large acreage. Yields were variable and not as heavy, in most cases, as desired."

SEED PRODUCTION.

In 1939 the value of flower and vegetable seed production in British Columbia was as follows: Flower-seed, $26,456; vegetable-seed, $72,130. War conditions have materially changed seed production possibilities in the Province during the past season. Much of the flower-seed produced in British Columbia is under contract to British firms. While contracts were placed this year with our growers it was ascertained very late in the season that no permits covering import of flower-seed would be issued by the British Government. At the present time the growers of this seed are attempting to dispose of it through other channels.

Vegetable-seed production for 1940 will show a marked value increase over that of 1939. The price has improved materially since the beginning of the year. There is also a heavy demand for seed for 1941 delivery and many British firms are placing contracts at satisfactory prices.

The outlook at the present time is most satisfactory and growers are in a much better position to meet this demand than they were a few years ago.

During the past year a Provincial Seed Board has been set up under the B.C. Marketing Act and they have appointed an agency (The British Columbia Seeds, Ltd.). This agency is the organization through which all registered and certified vegetable-seed produced in the Province is sold.

The Government of the Province, in order to further help the industry, secured the services of J. L. Webster, B.S.A. Mr. Webster devotes his full time to seed-work in the different sections of British Columbia. In addition to extension and inspection work a certain amount of his time is devoted to studying certain problems directly affecting the industry.

HORTICULTURAL SURVEYS.

Tree-fruits.

A survey of the tree-fruit plantings in the Okanagan and Kootenay fruit producing areas is made every five years. The 1940 survey was started in the fall of 1939 and finished in the late fall of 1940. The figures obtained will be compiled during the coming winter and will be available in the spring of 1941.

Small Fruits.

The biennial small-fruit survey for the Province was carried out this year. This survey shows a total of 2,895 growers engaged in the production of small fruits as compared with 3,040 growers in 1938. This form of survey has been conducted regularly every two years since 1920. A table showing the acreages in small fruits from 1920 to 1940, inclusive, is given in Appendix No. 3.

Pruning Demonstrations.

Pruning and top-working demonstrations have for a number of years been an important part of the extension-work undertaken by officials of the Horticultural Branch. The following table shows briefly the extent of this work in 1940:—

District.	No. of Demonstrations.	No. of Pupils.
Vancouver Island	13	328
Lower Mainland	5	81
Okanagan	28	106
Total	46	515

FIELD-INSPECTION WORK.

Fire-blight Inspection.

Inspection for fire-blight was again undertaken in the Okanagan Horticultural District. The results of this yearly inspection are most satisfactory and while fire-blight is still considered a serious disease it is realized by the growers that it is easily controlled if treated properly. The districts and acreage inspected in each district are detailed in the following table:—

District.	Total Acres inspected.	Inspected and passed.	Not passed.
Salmon Arm	218	215	3
Vernon	6,200	6,000	200
Kelowna	4,850	4,844	6
Summerland	2,713	2,693	20
Penticton	1,260	1,260	.....
Totals	15,241	15,012	229

Nursery Stock Inspection.

Inspection of stock produced by the various nurseries is carried out by your officials each year. The following table shows concisely the extent of the inspection-work undertaken during the past season:—

	Number inspected.	Number passed.	Number condemned.
Apples and crabs	48,428	47,986	442
Pears	21,439	21,286	153
Plums and prunes	18,063	17,542	521
Cherries	9,363	9,225	138
Peaches and apricots	39,276	38,504	772
Miscellaneous	8,186	8,186	.....
Totals	144,755	142,729	2,026

Twenty-three nurseries inspected; 29 inspections made; 1.4 per cent. of the inspected stock condemned.

In connection with the establishment of nurseries and the sale of nursery stock, it should be pointed out that the Provincial "Plant Protection Act" requires that all nurserymen and agents be licensed. In 1940 a total of 110 licences were issued; 82 to nurserymen and 28 to agents.

Pacific Mite Inspection.

Pacific mite was found for the first time in the Province in 1939. Two outbreaks were reported—one in a nursery and a second in the Oliver-Osoyoos District of the Okanagan Valley. In the case of the nursery, control measures were instituted, with the result that no mite was found following a summer inspection.

The work done in the fruit-growing area mentioned above is dealt with in the report submitted by R. P. Murray, District Field Inspector, in whose district the outbreak occurred:—

"A survey was made of the Oliver-Osoyoos District last season to determine the extent of the infestation found the previous autumn. It was found that the mite was more widespread than was first thought. It is now generally considered that all the orchards, with very few exceptions, in the Oliver District had some Pacific mite this season. The damage done this year was much lighter than last year and this autumn no heavy carry-over of mites was observed in any orchard.

"From experimental work done last summer very good controls were obtained with 1 quart of commercial lime-sulphur, 1 lb. of zinc sulphate, and ¼ lb. casein spreader to 100 gallons of water. This spray was applied during the growing season at times when the temperatures were quite high, with apparently no sulphur damage, even to susceptible varieties."

Pear Psylla Survey.

Pear psylla, while commonly found in eastern fruit-growing sections, has only recently made its appearance in the west and is now found in the State of Washington. The United States Department of Agriculture has, during the past season, been making a careful survey of all fruit-growing sections in that State in the hope that eradication measures might be instituted.

In British Columbia a survey was made early in August of all orchard areas adjacent to the International Boundary. This was carried out by our officials in co-operation with H. F. Olds, of the Federal Inspection Service. No psylla was found.

Late in the fall the presence of pear psylla was reported about 20 miles south of the International Boundary in the Okanogan Valley. Following this finding a most careful survey was made of all pear plantings in the Osoyoos, Oliver, Kaleden, Penticton, and Keremeos-Cawston Districts. This was undertaken by Provincial officials in co-operation with officials of the Dominion Department of Agriculture and the United States Department of Agriculture. A report on this work shows that no psylla was found.

Potato-beetle Inspection.

The largest infestation of potato-beetle is found in the East Kootenay District. Control-work in this area has been carried out for a number of years. The work done was undertaken with the view of preventing the spread of this insect rather than the total eradication. In this I think we have succeeded. The control-work in this section was again under the control of A. McMeans, from whose report the following statement is taken:—

"The potato-beetle control-work for the past three months of June, July, and August, 1940, has again been carried out by the British Columbia Department of Agriculture.

"Distribution of calcium arsenate poison-dust has been made available free of charge to all growers of potatoes in the areas of the potato-beetle infestation.

"This is the fourth season that I have been connected with this work and it is a pleasure to me to be able to state that the beetles have been less numerous the past season than in any year since I have been in charge of the work. Even in the larger districts such as Creston, Fernie, and Cranbrook, where the poison-dust has been used in large quantities, various growers have remarked and called to my attention the decrease in the number of beetles in the different districts.

"It is encouraging and gratifying to see this improvement. A few brief notes on weather conditions show that the month of June was very hot and dry, so much so that the larvæ hatched from eggs and made their appearance much earlier than usual. The month of June was followed by a very hot July. The thermometer on July 12th showed a temperature of 102° F. This hot weather, together with the smoke from the many bush fires, made conditions very oppressive.

"Adult beetles had emerged and egg masses laid before June 1st. Larvæ hatched from eggs were first noticed at Cranbrook on June 7th.

"The following table shows the dates for various years when the larvæ were first noticed:—

1940, June 7th.	1935, June 19th.
1939, July 3rd.	1934, June 8th.
1938, June 26th.	1933, June 19th.
1937, June 26th.	1932, June 19th.
1936, June 25th.	1931, June 15th.

"*Notes on Control by Districts.*

"*Creston.*—Increased acreage, beetles fairly abundant, progress seems to be gained in the Wynndel section. The Sirdar section practically clear. The distributer in the Creston section inclined to be a bit lavish in handing out the poison-dust.

"*Grasmere-Roosville.*—Beetles numerous but less than last season, distribution very good.

"*Bull River-Fort Steele.*—Control fairly well carried out, an increase in acreage.

"*Wardner.*—Considerable improvement in this district.

"*Jaffray-Sand Creek.*—Distribution of poison-dust excellent and beetles less noticeable.

"*Dorr.*—Improvement noticeable in this district and an increase in acreage.

"*Elko.*—Beetles rather scarce.

"*Baynes-Waldo.*—Beetles numerous, distribution excellent.

"*Newgate.*—Beetles scarce, decrease in acreage.

"*Kingsgate-Yahk.*—Good improvement, quite noticeable.

"*Cranbrook.*—Potato acreage increased, largely in the hands of Chinese growers. A noticeable decrease of beetles in this district.

"*Fernie.*—Beetles not quite as numerous, distribution of dust is good but inclined to be lavish.

"*New or Recurring Outbreaks.*

"Slight outbreaks occurred last season as follows: At Michel, I am pleased to state that no beetles were found this season. At Canal Flats, close inspections this season found the district free. Also the Karpovitch Ranch at Ginol was found free of beetles.

"You may note that I distributed some 915 lb. of poison-dust the past season. In making inspection in some small localities, I found that I could make distribution of poison-dust quite easily and handy. In some cases it saved the grower from making a trip to

secure the dust from a distribution point. This was done by carrying a dust supply in my car and I was only too glad to render this service."

The outbreaks at Thrums and Salmo have, according to Mr. Hunt, been satisfactorily controlled. The areas will, however, be subject to inspection during the coming year in order to make sure that eradication has been secured.

The Grand Forks infestation was again dealt with. While both larvæ and adult beetles were found, it seems possible that with careful inspection and dusting next year the potato-beetle in this area may be satisfactorily controlled.

HORTICULTURAL DEMONSTRATION-WORK.

The nature of the horticultural demonstration-work undertaken in each district depends entirely upon type and importance of the horticultural crops produced in each area. Some idea of the work being carried out may be obtained from the following statement:—

Vancouver Island	Strawberry Plant Selection; Boysenberry Trials; Grape Variety Trials; Raspberry Variety Trials; Thornless Loganberry Trials; Lettuce Variety Trials; Greenhouse Tomato Trials; Sweet Corn Trials.
Lower Mainland	Strawberry Variety Trials; Raspberry Variety Trials; Strawberry Plant Selection; Greenhouse Tomato Trials; Lettuce Variety Trials; Celery Variety Trials; Corn Variety Trials.
Okanagan	Raspberry Variety Trials; Wild-rice Test; Ground Sprays for Apple-scab; Hardy Apple Stock Trials on known and unknown roots; Codling-moth Sprays; Race Element Tests with Celery; Apple-scab Control; Peach-mildew Sprays; Preheating of Orchard-boxes; Orchard Cover-crops; Sweet Corn Trials; Edible Soy Bean Trials; Spraying with Plant Hormones; Celery Variety Trials; Lettuce Variety Trials; Onion-thrip Control; Orchard Fertilizer Trials; Pacific Mite Sprays.
Kootenay	Mealy-bug Control; Apple-scab Control; Little Cherry Investigations; Raspberry Variety Trials.

Some of the above investigations are undertaken in co-operation with officials of the Dominion Department of Agriculture as well as officials of other branches of this Department.

Strawberry Plant Selection.

Work in strawberry plant selection is being undertaken in both the Vancouver and Lower Mainland Horticultural Districts. The report on this work as carried out under the supervision of E. W. White, District Horticulturist for Vancouver Island, is herewith submitted:—

"This project, which is being carried out at the Dominion Experimental Station, Saanichton, by E. C. Reid, Assistant in Horticulture, passed through a further stage this year. The duplicate plots of ten plants each planted out in 1939 produced their first crop in 1940. Range 1 of these plots was on heavy soil and Range 2 on light soil. There were thirty-two individual selections of seven growers from which production records were kept. Mr. Reid has kindly furnished a report of yields from the various selections, which records some interesting information. A brief résumé will probably be sufficient to show the range of production.

"The lowest average yield per plant from Range 1 (heavy soil) was 0.53 lb.; the highest average yield per plant from Range 1 (heavy soil) was 1.56 lb. The lowest average yield per plant from Range 2 (light soil) was 0.76 lb.; the highest average yield per plant from Range 2 (light soil) was 1.96 lb. The lowest average yield per acre, taking both ranges into consideration, was 4,646 lb., while the highest average yield per acre from both ranges was 11,471 lb. It is interesting to note that the low yield per acre came from the plot which had the low yield in both Range 1 and Range 2. With one exception the yields from Range 2 (light soil) were consistently higher than from Range 1 (heavy soil).

" The grower whose plot gave the lowest average yield per acre, namely, 4,646 lb., also had the lowest average yield for all his plots, namely, 7,655 lb.; while the grower whose plot gave the highest average yield per acre, namely, 11,471 lb., also had the highest average yield for all his plots, namely, 10,509 lb. Selection No. 14 of the Experimental Station, of which there were only two plots of ten plants each, gave the highest average yield per acre of 10,963 lb.

" The first picking was made on May 27 and the last on June 20. This was a very short picking season and much below normal.

" As a result of the production records secured this year, further plant selections were made from the best plants of the best plots. These have already been propagated and will form the basis of a plot to be planted out next year from which it is hoped that certified plants may be distributed in 1942. Owing to June-bug and weevil injury the 1940 plot was ploughed under about two weeks ago, as it was felt that it would be too uneven to give any comparative results in 1941."

Raspberry Trials.

Early this season this branch was able to secure 500 plants of both the Washington and Tahoma raspberries. These are two new varieties, originated and introduced by the Western Washington Experimental Station, Puyallup, Washington. Plants were forwarded to each of the District officials in the main small-fruit areas. In addition to trying out these varieties, trials are also being carried out with other varieties such as the Taylor, Lloyd George, Newburg, Marcy, Indian Summer, Chief, etc.

Greenhouse Tomato Trials.

Recently there was introduced by research workers in Ontario a new tomato which was named " Vetomold." This variety was presumed to be mould-resistant. Seed was supplied to this office by workers at the Vineland Experiment Station in Ontario. Upon receipt of this seed it was sent out to various growers with the request that it be tried in comparison with one or more standard varieties grown at the present time. A number of reports have been received. In order to give some idea of the possible value of this introduction, both from the standpoint of yield and quality, the following is quoted from the report of E. W. White, District Horticulturist for Vancouver Island:—

" This variety was tested quite extensively as a spring crop by a number of growers and has proved eminently satisfactory from a mould-resistant standpoint.

" It would appear that the variety is practically mould-resistant, although some slight infection has been found. In the early part of the season it is difficult to see any difference between Best of All and Vetomold. However, as the season advances and mould becomes prevalent, the Vetomold remains green and vigorous while the plants of Best of All deteriorate very rapidly and growth practically ceases. The fruit appears to be quite satisfactory as to size and quality but is somewhat rougher than Best of All and has a tendency to show more marking at the blossom end. It is reported to stand more heat than Best of All and thus the houses can be kept warmer, the crop brought on earlier, and there is a conservation of fuel. One grower reports that he was unable to pack out as high a percentage of No. 1 crates owing to the rough character of the fruit, even though his total production per plant was much higher.

" Yields of Vetomold have far exceeded other varieties due to the lack of size of the fruit on plants affected with mould. One grower reports a yield of over 15 lb. per plant from a few plants given plenty of room.

" One large firm of white growers are so impressed with the possibilities of Vetomold that they are planting their whole greenhouse area to this variety for the 1941 spring crop.

" An agent for the growers brought in 6 lb. of Vetomold seed this fall so that the variety should be quite largely grown next year."

Codling-moth Control.

Spraying for the control of codling-moth is becoming of increasing importance each year, and each year finds officials of the Department of Agriculture undertaking demonstration work of a nature that will show growers the best sprays to use as well as the best time and method of application. The nature of the work is well illustrated in the following as taken from the report of B. Hoy, District Field Inspector for the Kelowna District:—

" Last year was reported to be the most difficult codling-moth season that we had ever experienced. Without any wish to be an alarmist, this year was considered by the majority of growers to be more difficult than last. Though it is agreed that this was a bad codling-moth year, owing to favourable weather conditions, many growers were more successful in controlling this insect than in any recent year. This better control was usually where infestation had been heavy in previous years and more efficient methods were adopted.

" The calyx spray was applied on the same dates as last year. Instead of the weather turning cool in May and June as last year, favourable weather for codling-moth activity continued through to harvest. Owing to these favourable conditions there was difficulty in controlling worms in all orchards that had a heavy carry-over from 1939.

" The chief reasons for poor codling-moth control can perhaps stand repeating. Lack of equipment and faulty application of sprays are the outstanding causes of poor control. The handicap of insufficient and obsolete equipment leads to hurried work and poor timing. However, it is gratifying to report that these reasons for poor control are becoming more obvious to growers each year. Each year many new sprayers are brought in. These new pumps are all of larger capacity and more efficient than the old machines ever were. Horse-drawn spray machines are rapidly becoming a thing of the past, nearly all of the newer ones being operated from a power take-off from tractor or truck. Good equipment and the proper use of spray is necessary in codling-moth control. Thorough spraying is an expensive business, but the cheapest in the end. Growers short of funds naturally try short cuts and the results are disastrous. Higher prices for apples would be codling-moth's greatest enemy in the Okanagan Valley.

" With the increase in codling-moth there is a continuous demand for better insecticides by the growers and an eagerness on the part of the insecticide companies to sell the growers something new. The policy of this office has been to discourage the use of untried material and those mixtures not suited to our conditions. Spraying is an expensive operation and unless an insecticide gives superior control to our standard materials there is no object to be gained by the extra outlay of money; so at all times when general recommendations are made price of material is considered as well as effectiveness.

" In order that no new materials may be overlooked, the Dominion Entomological staff, with the B.C. Horticultural Branch co-operating, continue to make careful field trials of all of those materials that show promise.

" Codling-moth bulletins were prepared and broadcast over CKOV throughout May, June, and August. These bulletins contained up-to-date information as to codling-moth control.

" This office co-operated with the B.C.F.G.A. and assisted in the preparation of codling-moth bulletins sent out by that organization.

" All meetings of the Okanagan Spray Committee were attended. At the meetings of the committee, which is made up of officials of the Dominion and Provincial Departments of Agriculture, control measures are considered. It is only after full discussion of the results of careful field trials that season's recommendations are adopted. This year arsenate of lead in first-brood sprays and Cryolite for later sprays were recommended. These materials are the most economical on the market and in careful tests show themselves to be equal to the best of the new materials tried out and superior to a great many others. These facts are also demonstrated repeatedly by the excellent control many of our more careful growers are capable of getting year after year. The use of Cryolite in second-brood sprays has obviated the immediate need of washing-machines in our packing-houses and has enabled this Valley to export many thousands of dollars' worth of fruit to the U.S.A. The continued use of arsenate of lead in late sprays would have forced washing-machines upon us or resulted in Okanagan fruit being shut out of the United States markets.

" Though it is the general opinion that any spreaders containing lime should not be used with Cryolite, field trials and large-scale operations in this Valley have demonstrated that Cryolite with casein-lime spreader is a very effective spray."

At the last convention of the British Columbia Fruit-growers' Association, held in Penticton, January, 1940, it was suggested that codling-moth demonstration control-work be extended throughout the Valley. Acting on this suggestion and in co-operation with grower groups in different areas this was done. The result was that demonstration spraying work was carried out at the following points: Armstrong, Oyama, Winfield, Kelowna, Westbank,

Summerland, Naramata, Osoyoos, Oliver, Kaleden, and Keremeos. This work will undoubtedly be continued during the coming season and if possible may also be extended.

Mealy-bug Control.

Demonstration-work in the control of mealy bug has been carried on in the Kootenays for a number of years. The main object of the work is to ascertain the best spray solution for control. This work is undertaken in co-operation with Dominion Department of Agriculture officials by E. C. Hunt, District Horticulturist for the Kootenays. The following is an outline of the work carried out in 1940 and quoted from Mr. Hunt's report:—

"It would appear that the apple mealy bug greatly decreased in the Kootenay orchards during 1940. At least this was very noticeable in quite a number of places. However, the insect is still a problem and can very quickly build up its population under suitable weather conditions. Its control will still be required in many orchards of the district. Your assistant in co-operation with the Science Service officials (Entomologist) of the Dominion Department of Agriculture have carried out a number of experiments with different spray materials and mixtures in the control of mealy bugs here in the Kootenay District. This work has now extended over a period of about six years. For the past three years the work has been much more extensive and has been carried on in W. E. Slater's orchard at Harrop, B.C. The 1940 results corroborated those of 1939, in that better control of the mealy bug was secured with the application of 110 Vis. oil than with 223 Vis. oil when used at the same strength. A 4-per-cent. oil (110 Vis.) has given general satisfactory control of the mealy bugs in the experimental plots, as well as where used by growers on a larger spraying scale, if the spraying was thoroughly done. Oil of 40 Vis. (Diesel oil) used at 6 per cent. as in Plot 21, apparently gave as good control as the 4-per-cent. 110 Vis. oil, and the cost of the 6-per-cent. Diesel oil is about 80 cents as compared with $1.20 for the 4-per-cent. 110 Vis. oil for 100 gallons of spray. The mixture of 2-per-cent. lime-sulphur and 2-per-cent. dormant oil (110 Vis.), Plot 18, and the mixture of 2-per-cent. lime-sulphur and 2-per-cent. Diesel oil (40 Vis.), Plot 19, gave very good control of the mealy bugs and good enough on a one-year test to merit general recommendation. If these mixtures prove satisfactory in the control of this insect, as every indication points that they will, the cost would be less than half of the lime-sulphur-oil mixture now recommended. It has been felt that the lack of control of the mealy bugs in the infested orchards of the district has been mostly due to inadequate spraying, due to some extent to insufficient spray equipment, but more so to very high cost of spray mixtures considered necessary to control this insect. With these much cheaper spray mixtures that have proven quite satisfactory in the control of the mealy bugs, after one- and two-year tests, considerably more effective spraying should result. It is proposed to carry on control-work of this insect for at least another year, but the experiments or tests will be made in another section of the district."

Sweet Corn Trials.

With a view to ascertaining the best type of sweet corn suitable for marketing conditions and also in order to establish the value of new introductions put out by the Central Experimental Farm at Ottawa, corn trial plots were established at points in the Vancouver Island, Fraser Valley, and Okanagan Horticultural Districts. As there would be too much duplication if all plots were reported on, it is thought advisable to submit only the report on the work by H. H. Evans, District Field Inspector, Vernon, which is as follows:—

"This series of sweet corn trials was a continuation of previous year's work in testing new varieties, strains, and hybrids of sweet corn with reference to earliness, yield, quality, and general adaptability to the district.

"The past season proved an excellent corn year; early growth with continuous favourable weather provided excellent pollination conditions and rapid cob development.

"Through the excellent co-operation of T. P. Hill, manager of the ranch, the plots received the best of cultural attention, which ensured optimum growth response.

"Some injury to the crop was caused by depredations of pheasants, but this did not interfere with obtaining records of performance. No canning tests of the crop were conducted.

"Plots were $\frac{1}{100}$ acre each. Spacing between rows 40 inches and between hills 24 inches. Date of seeding May 1st. Quality and rating, maximum 10 points each. Twenty-five hills checked in each plot. Checks made July 19th, July 30th, and August 8th.

Sweet Corn Comparison Table.

Variety.	Height.	Type and Colour.	Yield in Cobs per Hill.	Ready for Fresh Market.	Quality, 10.	Rating, 10.
Ottawa Hybrids.						
60-day Golden x Dorinny	4 ft. 6 in.	Cobs med. long, med high set, 8–10 rowed; core small; grain pale yellow, large, med. depth	5.5	July 19	9.0	9.0
Banting x Black Mexican	4 ft. 6 in.	Cobs long, low set; very small core, 8-rowed; grain yellow, large, deep, rich; skin tough	5.6	July 27	8.5	9.0
Dorinny x Banting	4 ft. 6 in.	Cobs large, high set; 8-rowed; core med. large; grain pale yellow, small, deep	4.6	July 23	9.0	10.0
Sungold	6 ft. 8 in.	Cobs med. long, high set; core large, 14–16 rowed; grain golden, med. size and depth, rich and tender	4.9	July 27	10.0	10.0
Pickdel	4 ft. 6 in.	Cobs med. short, low set; core large, 10–12 rowed; grain yellow, med. size, shallow, poor filling	6.0	July 18	8.0	6.0
Delden	5 ft. 8 in.	Cob long, high set; core med. large, 10–12 rowed; grain pale yellow, small, shallow, tender, sweet	3.6	Aug. 5	7.5	6.0
Swiftgold	4 ft.	Cob small, low set; core small, 8-rowed; grain golden, small, deep, rich; skin slightly tough	6.0	Aug. 18	8.5	8.5
Delinny	4 ft. 6 in.	Cob long, low set; core med. large, 8-rowed; grain pale yellow, small, shallow, very sweet and tender	5.0	July 22	8.0	7.0
Goldban	5 ft.	Cob long, med. high set; core small, 8-rowed; grain yellow, large, deep, rich; skin slightly tough	7.1	July 26	9.0	10.0
Seed-house Stocks.						
Kingcrost	6 ft. 6 in.	Cob med. size, high set; core small, 8-rowed; grain yellow, large, med. depth, rich; skin slightly tough	4.8	July 29	8.0	8.5
Topcross Bantam	7 ft.	Cob long, high set; core med. large, 10–12 rowed; grain pale yellow, small, deep, sweet, tender	4.8	Aug. 6	8.5	9.0
Topcross Whipples	8 ft. 6 in.	Cob long, high set; core med. large, 14–16 rowed; grain pale yellow, small, deep; skin slightly tough	4.9	Aug. 5	7.5	8.0
Saachen	8 ft.	Cob long, high set; core med. large, 10-rowed; grain pale yellow, med. size, shallow, rich; skin slightly tough	5.0	July 31	7.5	8.5
Spancross P-39	6 ft. 6 in.	Cob large, high set; core med. large, 12-rowed; grain yellow, large, deep, fairly rich; skin slightly tough, good type	5.3	July 23	7.0	8.5
Golden Bantam (check)	7 ft. 6 in.	Cob long, high set; core small, 8-rowed; grain golden, large, deep, rich, sweet, tender	5.2	July 30	9.0	10.0

Sweet Corn Comparison Table—Continued.

Variety.	Height.	Type and Colour.	Yield in Cobs per Hill.	Ready for Fresh Market.	Quality, 10.	Rating, 10.
Seed-house Stocks—Continued.						
60-day Golden (check)	5 ft. 8 in.	Cob large, high set; core med. large, 10–12 rowed; grain large, med. deep, yellow, rich, sweet; skin slightly tough	6.1	July 21	8.0	9.0

"*Remarks.*—A study of the above table reveals in the growth and yield columns the excellent cultural conditions given the plots. The maturity date indicates first picking ready for fresh market. Range of maturity between varieties is fairly long. The varieties showing low to medium low set cobs are very subject to destruction by pheasants. This, however, should not discourage their production, as earliness, quality, and yield would justify protection of the crop from this pest.

"The general rating has been based on quality, yield, size of cob and core, uniformity of set and filling, type, colour, and season. Varieties having a quality rating below 8, and a general rating below 7, may be discontinued. New strains and hybrids not yet proven should be continued to check effect of seasonal variations on performance."

Lettuce Variety Trials.

Trials with various lettuce varieties were carried out by your officials in the Vancouver Island, Fraser Valley, and Okanagan Districts. All of these were of outstanding value in indicating varieties suitable for commercial planting in the different sections. This work was a continuation of similar work undertaken for the past several years. As the Okanagan trials are the most extensive and have been dealt with in past reports they are again recorded in this report. The following is quoted from the report of H. H. Evans, District Field Inspector, Vernon:—

"This project continues several years' work of variety testing which has proven of considerable commercial value in introducing new varieties and strains which have greatly increased the yield and shipping value of the lettuce-crop of the Armstrong District.

"Growth conditions for the crop were excellent throughout the season, but not as satisfactory from the standpoint of tip-burn and frost-resistance, as both spring and fall crops had reached overmaturity before any damage from these two factors occurred.

"*Spring Series.*—Twenty-five plots; plants per plot, fifty; frame seeded, March 10th; field planted, April 18th; checks made May 28th and June 14th.

"*Stocks of Seed-house No. 1.*

"*Imperial F.*—May 28th: Filling and firming slowly. June 14th: Filled but very slack; No. 1 cutting-heads; no tip-burn. (Not suitable.)

"*Imperial D.*—May 28th: Filling and firming slowly. June 14th: Head filled and fairly solid; medium size; cutting-heads, 85 per cent.; no tip-burn or slime; coarse texture; good quality. (Good.)

"*Imperial No. 615.*—May 28th: Filling and firming slowly. June 14th: Heads filled but slack; medium size; cutting-heads, 15 per cent.; no tip-burn or slime. (Not suitable.)

"*Imperial No. 847.*—May 28th: Heads filling fast and firming fair. June 14th: Heads well filled, large, solid; cutting-heads, 90 per cent.; no tip-burn or slime; good texture. (Very good.)

"*Imperial No. 850.*—May 28th: Heads filling and firming fast. June 14th: Heads filled and solid; large; cutting-heads, 85 per cent.; no tip-burn or slime. (Very good.)

"*Imperial No. 44.*—May 28th: Heads filling and firming fast. June 14th: Heads filled; solid; medium size; cutting-heads, 97 per cent.; fine texture; no tip-burn or slime. (Excellent.)

"*Imperial No. 152.*—May 28th: Heads filling fast; large and slack. June 14th: Heads well filled but slack; large; cutting-heads, 60 per cent.; good texture and quality; no tip-burn or slime. (Fair.)

New York No. 515–199.—May 28th: Heads filling and firming fast. June 14th: Heads well filled; solid; large; cutting-heads, 88 per cent; good texture and quality; no tip-burn or slime. (Very good.)

"*New York 12.*—May 28th: Heads filling and firming fast; 6 heads fit to cut. June 14th: Heads filled and solid; 97 per cent. cut; medium size; good texture and quality; no tip-burn or slime. (Excellent.)

"*Imperial No. 515–4.*—May 28th: Heads filling and firming fast. June 14th: Heads filled; slightly slack; large; cutting-heads, 85 per cent.; good texture and quality; no tip-burn or slime. (Very good.)

"*Stocks of Seed-house No. 2.*

"*Cosberg.*—May 28th: Heads filling; not firming. June 14th: Heads filled; fairly solid; medium size; high quality; cutting-heads, 75 per cent.; no tip-burn or slime. (Good.)

"*Imperial No. 152.*—May 28th: Heads filling fast; not firm. June 14th: Heads filled but slack; large; cutting-heads, 65 per cent.; no tip-burn or slime; good quality. (Fair.)

"*Imperial No. 44.*—May 28th: Heads filling and firming fast; medium size. June 14th: Heads filled; not quite solid; 93 per cent. cut; fine texture and quality; no tip-burn or slime. (Excellent.)

"*Imperial No. 847, Stock 395497.*—May 28th: Heads filling and firming fast; odd heads fit to cut. June 14th: Heads filled; solid; large; 94 per cent. cut; good texture and quality; no slime or tip-burn. (Excellent.)

"*Imperial No. 847, Stock 365491.*—May 28th: Heads filling and firming fast. June 14th: Heads filled; not quite as solid as previous plot; large; 90 per cent. cut; good texture and quality; no slime or tip-burn. (Very good.)

"*Imperial No. 847, Stock 395496.*—May 28th: Heads filling fast and firming. June 14th: Heads well filled but slacker than previous numbers; 80 per cent. cut; good texture and quality; no slime or tip-burn. (Fairly good.)

"*Imperial No. 847, Stock 385494.*—May 28th: Heads filling fast and firming. June 14th: At this date plot on a par with 365491. (Good.)

"*Imperial No. 847, Stock 385495.*—At both periods this strain on a par with No. 385494. (Good.)

"*Stocks of Seed-house No. 3.*

"*Imperial No. 850.*—May 28th: Heads filling and firming. June 14th: Heads filled but slightly slack; large; loose for No. 1 heads; good quality; 80 per cent. cut; no slime or tip-burn. (Fairly good.)

"*Imperial No. 152.*—May 28th: Heads filling and firming. June 14th: Heads filled but slack; large; loose for No. 1 heads; good quality; 80 per cent. cut; no slime or tip-burn. (Fairly good.)

"*Imperial No. 847.*—May 28th: Filling fast but not firming. June 14th: Heads well filled; solid; large; 90 per cent. cut; quality and texture good; no slime or tip-burn. (Very good.)

"*Imperial D.*—May 28th: Heads filling fast. June 14th: Heads filled but slightly slack; large; coarse texture; 80 per cent. cut; no slime or tip-burn. (Fairly good.)

"*New York Hybrid No. 94.*—May 28th: Filling and firming fast; odd heads fit to cut. June 14th: Heads filled and firm; large; 90 per cent. cut; good quality and texture; no tip-burn or slime. (Very good.)

"*New York No. 515.*—May 28th: Heads filling and firming fast. June 14th: Heads filled and solid; large; cut 95 per cent.; good quality and texture; no tip-burn or slime. (Excellent.)

"*Imperial No. 44.*—May 28th: Heads filling and firming fast; odd heads fit to cut. June 14th: Heads filled; solid; medium size; cut 100 per cent.; good quality and texture; no tip-burn or slime. (Excellent.)

"*Fall Crop.*—Field seeded July 24th; checked, September 13th and October 2nd.

"At the September 13th examination it was found that of Seed-house No. 1 stocks, Imperial F had failed to germinate and Imperial D had almost failed.

"In Seed-house No. 2 stocks there will be found a series numbered 1 to 9, inclusive. These were additional stocks added to the fall series which arrived too late for the spring seeding. All plots were growing rapidly at September 13th, but none advanced enough for recording. Data is therefore recorded from the October 2nd examination. No frost had been experienced up to October 2nd.

"*Stocks of Seed-house No. 1.*

"*Imperial No. 615.*—October 2nd: Heads filled; large, but too slack; cutting-heads, 75 per cent.; No. 2; good quality and texture. (Not suitable.)

"*Imperial No. 847.*—October 2nd: Heads filled; large; medium firm; good quality; cutting-heads, 88 per cent. (Good.)

"*Imperial No. 850.*—October 2nd: Heads filled, but slack; good quality; cutting-heads, 45 per cent.; No. 1 and a few No. 2. (Fair.)

"*Imperial No. 44.*—October 2nd: Heads filled; solid; medium large; good quality; cutting-heads, 100 per cent. (Excellent.)

"*Imperial No. 152.*—October 2nd: Heads filled; solid; medium large; good quality; cutting-heads, 90 per cent. (Very good.)

"*New York 515–199.*—October 2nd: Heads filled, but inclined to be slack; good quality; cutting-heads, 70 per cent. (Fairly good.)

"*New York No. 12.*—October 2nd: Heads filled but quite slack; large; good quality; cutting-heads, 55 per cent. (Fair.)

"*New York No. 515–4.*—October 2nd: Heads filled, fairly solid; large; good quality; cutting-heads, 70 per cent.; other heads would make some No. 2. (Fairly good.)

"*Stocks of Seed-house No. 2.*

"*Cosberg.*—October 2nd: Heads large, filled, but all blown. (Not satisfactory.)

"*Imperial No. 152.*—October 2nd: Heads filled; medium solid; large; good quality; cutting-heads, 70 per cent.; other heads would make some No. 2. (Fairly good.)

"*Imperial No. 44.*—October 2nd: Heads filled; solid; medium size; quality good; cutting-heads, 100 per cent. (Excellent.)

"*Imperial No. 847, Stock 395497.*—October 2nd: Heads filled; fairly solid; large; quality good; cutting-heads, 80 per cent. (Good.)

"*Imperial No. 847, Stock 365491.*—October 2nd: Heads filled; fairly solid; large; quality good; cutting-heads, 80 per cent. (Good.)

"*Imperial No. 847, Stocks 395496, 385494, 385495.*—October 2nd: Heads filled, but a little slack; large; quality good; a few No. 1 heads; nearly whole cut might have gone No. 2. These three stocks were quite similar.

"(1) *Imperial No. 615, Stock 395437.*—October 2nd: Heads filled but not firming; medium size; none fit to cut.

"(2) *Imperial No. 615, Stock 375432;* (3) *Imperial No. 615, Stock 395433;* (4) *Imperial No. 615, Stock 395435.*—These plots were exactly on a par with Plot No. 1.

"In a recheck of the above plots on October 17th, all the plots were very uniform, with about 60 per cent. of the heads fit to cut; none very solid. (Not suitable.)

"(5) *Imperial No. 850.*—October 2nd: Heads filled but slack; none fit to cut. A later check showed a few cutting-heads but most of the plot had blown. (Not suitable.)

"(6) *New York W.S. 12.*—October 2nd: Heads filled but quite slack. These never did firm enough for cutting. (Not suitable.)

"(7) *New York No. 199.*—October 2nd: Heads filled; fairly solid; good quality; cutting-heads, 70 per cent.; others would cut later. (Good.)

"(8) *Columbia No. 1,* (9) *Columbia No. 2.*—October 2nd: These two varieties are medium size heads; somewhat of the Iceberg type; filled fairly well but never did firm up. (Not suitable.)

"*Stocks of Seed-house No. 3.*

"*Imperial No. 850.*—October 2nd: Heads filled; large and bursting; none made cutting-heads. (Not suitable.)

"*Imperial No. 152.*—October 2nd: Heads filled; medium large; solid; quality good; cutting-heads, 88 per cent. (Very good.)

"*Imperial No. 847.*—October 2nd: Heads filled; fairly solid; large; quality good; cutting-heads, 80 per cent. (Good.)

"*Imperial D.*—October 2nd: Heads filled; solid; medium large; quality fair; texture coarse; cutting-heads, 90 per cent. (Very good.)

"*New York No. 94.*—October 2nd: Heads filled but slack and bursting; large; quality good; not more than 30 per cent. No. 2. (Not suitable.)

"*New York No. 515.*—October 2nd: Heads filled but quite slack; large; quality good; not more than 40 per cent No. 2. (Not suitable.)

"*Imperial No. 44.*—October 2nd: Heads filled and solid; quality good; cutting-heads, 98 per cent.; medium size. (Excellent.)

"The past fall growing conditions, though not appearing abnormal, were very trying and hard on the heading of lettuce. Growth was excellent, but the heads refused to harden properly. This condition was found in the test plots and was duplicated in the commercial crops. Any varieties in this series which show a high percentage of cutting-heads are worthy of notice from the heading standpoint. The Imperial No. 44 is only the second year on trial, but has shown outstanding characteristics.

"In commercial field tests carried out on the Sing Lee ranch, a seeding was made every two weeks from April 1st to August 10th with New York No. 515, New York No. 94, and Imperial No. 44 strains from the stocks of Seed-house No. 3. In June, Imperial No. 847 and No. 152 strains were added. This work was for the express purpose of checking seasonal suitability of those varieties which had either been proven for spring and fall crops or showed good promise.

"The following observations were recorded:—

"*Imperial No. 44.*—Gave the most outstanding performance throughout. This variety heads very quickly, is of ideal size and texture. Crops maturing from mid-July to mid-August had some tip-burn. (Excellent.)

"*New York No. 94.*—This variety matured for cutting nine days earlier in the spring crop than any of the other varieties or the standard No. 12 variety growing alongside. In later seedings it failed to harden its heads satisfactorily and tip-burned rather badly in mid-summer. In fall crops it grew large but slack. This strain appears very suitable for the very early spring crop as a companion to No. 44.

"*New York No. 515.*—This variety was the last to reach cutting maturity of the three varieties in the early spring crops and gave favourable results until mid-July. After this it was subject to tip-burn and bolting during summer heat.

"*Imperials No. 847* and *No. 152* were added to the seedings made on July 15th, also in later seedings. Imperials No. 44, No. 152, and No. 847, in the order named, gave the best results in earliness of maturity and cut-out of crop. All were satisfactory. New Yorks No. 94 and No. 515 produced large heads but did not harden at all well; No. 515 was the better of the two.

"This commercial test was of considerable value in providing some definite information and should be continued for a year or two to check seasonal influence."

Celery Variety Trials.

The result of trial work with celery varieties is well outlined in the report of H. H. Evans, from which the following is quoted:—

"This series of celery variety trials continues the work of 1939 in an effort to find improved varieties suited to the district for both spring and fall crops. The plots included both yellow and green types. Seasonal and growth conditions were fairly normal. Intense heat and moisture shortage hastened maturity in the summer crop, and flooding from the sub-irrigation ditches stunted a portion of all plots in the fall series. Excellent cultural conditions were provided throughout by the operator.

"An application of 5–10–5 fertilizer at 1,500 lb. per acre was applied to each crop as a side dressing.

"Spring plots were $\frac{1}{100}$ acre each; fall plots, $\frac{1}{50}$ acre each.

"*Spring Crop.*—Frame seeded, March 30th; field planted, May 3rd; harvested, July 24th; records taken, July 17th.

"*Stocks of Seed-house No. 1.*

"*California Golden No. 14 (Yellow).*—Head short, compact; stalk heavy, inclined to split at base; early maturing; stringy; full bleach; stalk inclined to soften; doubtful shipper; weight per head, 1¼ lb.; light suckering; bolted, 10 per cent. (Doubtful.)

"*Improved Wonderful Long Joint (Yellow).*—Head tall, heavy, compact, good type; stalk heavy; solid, brittle; good bleach; light suckering; just odd heads bolted; weight per head, 2 lb. Approximately 115-day celery. (Very good.)

"*Secaucus Green (Semi-green).*—Head tall, heavy, compact, good type; stalk heavy and solid; brittle; fair bleach; medium suckering; no bolting; weight per head, 2 lb. 14 oz. Approximately 110-day celery; stalks inclined to blow up if over-mature. (Good.)

"*Stocks of Seed-house No. 2.*

"*Golden Pascal (Yellow).*—Head tall, light, fair type; stalk long, thin, solid, fair bleach, light suckering, stringy, odd heads bolted; weight per head, ¾ lb.; approximately 125-day celery. (Not suitable here.)

"*Yellow Hybrid No. 45 (Yellow).*—Head short, compact, fair type; stalk short, fair body, stringy, good bleach, heavy suckering, 7 per cent. bolt; weight per head, 1 lb. Approximately 120-day celery; too short head for our requirements. (Not suitable here.)

"*Florida Golden (Yellow).*—Head medium tall, heavy, slightly open, fair type, stalk medium body, solid, stringy, good bleach, medium suckering; odd heads bolted; weight per head, 1 lb. 9 oz. Approximately 115-day celery. Head a little short. (Good.)

"*Morse Masterpiece (Yellow).*—Head short, heavy, fairly compact, good type, stalk heavy, solid, slightly stringy, good bleach, medium suckering, no bolting; weight per head, 1 lb. 14 oz. Approximately 115-day celery. Heads too short. (Very fair.)

"*Tall Non-bolting Golden Plume (Yellow).*—Head tall, heavy, compact, good type, stalk heavy, solid, brittle, good bleach, medium suckering, no bolting; weight per head, 1 lb. 14 oz. Approximately 125-day celery. (Very good.)

"*Crystal Jumbo (Semi-green).*—Head tall, heavy, compact, good type, stalk heavy, solid, brittle, medium bleach, heavy suckering, 10 per cent. bolted; weight per head, 1 lb. 14 oz. Approximately 110-day celery. (Good.)

"*Autumn King (Green).*—Head tall, loose light body, poor type, stalk thin, solid, dead green, slightly stringy, heavy suckering, late maturing, 20 per cent. bolted; weight per head, 1 lb. Approximately 130-day celery. (Not suitable here.)

"*Epicure (Semi-green).*—Head medium tall, heavy, compact, stalk heavy, solid, brittle, no suckers, odd heads bolted; weight per head, 2 lb. 3 oz. Approximately 120-day celery; a little short, but nice. (Good.)

"*Utah (Green).*—Head tall, heavy, slightly open, stalk heavy, solid, brittle, very few suckers, no bolting; weight per head, 2 lb. 10 oz. Approximately 120-day celery. (Very good.)

"*Fall Crop.*—Frame seeded, May 28th; field planted, July 5th; checks made, September 13th and October 10th; harvested, October 17th.

"*Stocks of Seed-house No. 1.*

"*California Golden No. 14 (Yellow).*—Head medium tall, heavy, compact, stalk heavy, solid, stringy, inclined to split at base; early maturing; full bleach; no suckers; weight of head, 1 lb. 8 oz. Approximately 110-day celery. Fair quality. (Fair.)

"*Improved Wonderful Long Joint (Yellow).*—Head tall, heavy, compact, good type, stalk thick, solid, brittle, high quality, bleached, light suckering; 115-day celery; weight per head, 2 lb. 3 oz. (Very good.)

"*Secaucus Green (Semi-green).*—Head tall, heavy, compact, good type, stalk thick, brittle, solid, high quality, early maturing, medium suckering; 105 to 110-day celery; inclined to blow the stalk if overmature; weight per head, 3 lb. (Very good.)

"*Stocks of Seed-house No. 2.*

"*Golden Pascal (Yellow).*—Head tall, light, slightly open, stalk long, thin, solid, stringy, fair bleach, quality fair, light suckering; 125-day celery; weight per head, 1 lb. 2 oz. (Not suitable here.)

"*Yellow Hybrid No. 45 (Yellow).*—Head short, medium heavy, compact, short thick stalk, stringy, good bleach, fair quality, medium suckering; 120-day celery; weight per head, 1 lb. 4 oz. Too short. (Not suitable here.)

"*Florida Golden (Yellow).*—Head medium tall, medium heavy, slightly open; stalk medium thick, solid, slightly stringy, fair quality, bleached; light suckering; 115- to 120-day celery; weight per head, 2 lb. (Good.)

"*Morse Masterpiece (Yellow).*—Head quite short, heavy, fairly compact; stalk thick, solid, slightly stringy, good quality, full bleach; light suckering; 115- to 120-day celery; weight per head, 2 lb. A nice celery but heads too short for crate shipping. (Fair.)

"*Tall Non-bolting Golden Plume (Yellow).*—Head medium tall, heavy, compact; stalk thick, solid, brittle, bleached, fair to good quality; very light suckering; 125- to 130-day celery; weight per head, 2 lb. 3 oz. (Good.)

"*Autumn King (Deep Green).*—Head tall, light body, medium compact, poor type, stalk medium, solid, slightly stringy, strong flavour; heavy suckering; 130- to 140-day celery; weight of head, 1 lb. 8 oz.; bleaches slowly. (Not suitable here.)

"*Epicure (Semi-green).*—Head medium tall, heavy, compact, slight suckers; stalk heavy, solid, very brittle, good quality; mild flavour; medium bleach; 125-day celery; weight of head, 2 lb. 5 oz. (Very good.)

"*Crystal Jumbo (Semi-green).*—Head tall, heavy, compact, medium suckers; stalk heavy, solid, brittle, good quality, slightly strong flavour; medium bleach; 115- to 120-day celery; weight of head, 2 lb. 3 oz. (Very good.)

"*Utah (Green).*—Head tall, heavy, slightly open, no suckers, stalk heavy, solid, brittle, good quality and flavour, light bleach; 130- to 140-day celery; weight per head, 2 lb. 14 oz. (Very good.)

"The most promising of these varieties should be selected and given further trial. There appeared considerable promise of some of the semi-green types being adapted to extending the period of the spring crop, also of being available for early fall shipping ahead of the Utah variety which is a long-period celery. The weight per head given was the average of trimmed heads per crate. As the majority of the Armstrong-grown celery is moved in California-type crates, varieties are not favoured which produce short heads, even though heavy bodied and good quality. A half-crate each of the green types from the fall crop were placed in common storage for quality and keeping records. These unfortunately got severely frozen in the sudden zero spell in early November and had to be abandoned."

ORCHARD COVER-CROPS AND FERTILIZERS.

Work with orchard cover-crops was continued during the past year as well as the orchard fertilizer work which has been carried on for a number of years. Both lines of work are particularly essential in order to ascertain the best course to follow in maintaining the growth and productiveness of the orchards in the fruit-growing areas. Results of the work are to be found in the circulars published from time to time by this branch.

PREHEATING APPLE-BOXES.

This is a continuation of work carried out in 1939 by R. P. Murray, District Field Inspector, Penticton. The results for 1940 are shown in the following statement taken from Mr. Murray's report:—

"Preheating apple-boxes before sending them back to the orchards was again carried out by two packing-houses in the Penticton District this year. Results were in line with other years and these two houses consider the results very satisfactory. Due to the season the work was started earlier than usual and boxes could have been moved with safety earlier than they were. The attention of all the packing-houses in the district had been drawn to this method of destroying over-wintering worms before they are able to cause any damage, but the idea is not being taken up as quickly as it might be. The cost of this work was about the same as in former years, namely, 0.015 cent."

PUBLICATIONS AND REPORTS.

The revision of publications requiring reissuing, as well as the preparation of new publications, has been attended to whenever necessary. A new series of circulars dealing with seed-growing has been started and will be added to during the coming season.

From time to time officials of your staff are required to compile reports dealing with the fruit and vegetable crop; climatic conditions, crop prospects and estimates, as well as the final figures on the crop yields and value.

During the summer months the Horticultural News Letter is issued every two weeks. This publication has an extensive mailing-list and is compiled from reports forwarded to M. S. Middleton, District Horticulturist, Vernon, who edits the field reports received.

ACKNOWLEDGMENTS.

In conclusion your Horticulturist would like to take this opportunity of thanking the officials of the Provincial and Dominion Departments of Agriculture for their co-operation during the past season. Thanks are also extended to the Agricultural Faculty of the University of British Columbia.

REPORT OF PROVINCIAL PLANT PATHOLOGIST.

J. W. EASTHAM, B.Sc., PLANT PATHOLOGIST.

Special delivery tags, totalling 1,023, were issued to Prairie nurserymen during 1940, of which 916 have been accounted for up to date. In addition, 50 were issued for greenhouse stock. These figures are somewhat less than those for 1939. Of the orders filled under these tags 188 contained bulbs, 443 ornamentals, 84 fruit-trees, 156 small fruits, 120 rhubarb and asparagus, and 25 grapes.

In addition, some 60 shipments without special delivery tags were inspected at Vancouver. These included one commercial shipment of 2,000 gladiolus corms and several of Caragana, totalling 2,500 plants, mostly seedlings, and a few sandcherries and other hardy fruits. The remaining shipments were small and mostly non-commercial, consisting of native plants and small lots from private gardens.

NEW DISEASES.

The only new disease of importance to be recorded from the Mainland is Chrysanthemum Rust (*Puccinia Chrysanthemi* Roze) which was found to be doing considerable injury to both greenhouse and outdoor chrysanthemums in Stanley Park, Vancouver. This disease, although widely distributed, does not seem to have been recorded previously from British Columbia.

Mr. Foster also reports the following from Vancouver Island:—

Tomato Fruit-pox.—A disease identical with the description of tomato fruit-pox in Phytopathology 30:*343–44*, 1940, was observed in a greenhouse near Victoria in a variety purchased by the grower as One Hundred Fold. At least 35 per cent. of the plants were diseased. The tomato fruits were observed to bear a number of scattered, abnormally green, circular, elongated, or irregular dots, up to 3 mm. in diameter, imparting a mottled appearance and tending to predominate along the region extending from the stylar scar to the pedicel. The mottle spots occur on fruits of all ages. As the fruits colour, the dark green spots remain green or turn yellow. The cause of this disease is not known, but a virus is suspected.

NEW WEEDS.

Diffuse Knapweed; Diffuse Star Thistle (*Centaurea diffusa* Lam.) *Compositæ.*—Annual, 1 to 2 feet high, with a slender tap-root. Stem rough-angular, flocculent-woolly to merely pubescent, densely branched almost from the ground. Leaves narrowly obovate to lanceolate, deeply divided except the uppermost which are linear and entire; grayish green with heavy pubescence; punctate on upper surface; root-leaves long-stalked, mostly withering at flowering time. Heads very numerous (an average sized plant in the herbarium has over 600), small. Involucre narrowly cylindric, about ⅓ inch long and ⅙ inch wide, straw-coloured. Individual bracts of the involucre dry, membranaceous, fringed along each side and ending in a rather strong spine. Flowers in the head few, yellowish-white or with a pinkish tinge, the outermost not enlarged to form a false ray. A native of the Eastern and Southern portions of the Balkan Peninsula, Southern Russia and Western Asia, and introduced into Southern and Central Europe. This plant was found forming dense patches at several places in the Grand Forks District, being particularly abundant along the roadsides between

the town and the Old Smelter. A few plants were also found north and south of Penticton. Whether this will be a weed of economic importance or not is difficult as yet to predict. It seems to have some of the characteristics and habit of Russian Thistle and the large number of flower heads gives it considerable powers of rapid spread.

False Ragweed; Careless Weed (*Iva xanthifolia* Nutt.) *Compositæ.*—Annual, 2 to 8 feet tall. Leaves opposite or only the upper alternate, petioled, blades 2 to 12 inches long, lance-ovate to somewhat heart-shaped, palmately 3-ribbed, coarsely toothed sometimes with shallow lobes, finely hairy. Heads numerous in axillary or terminal spikes or panicles. Achene brown to black, compressed.

This plant is a native of the Prairie Provinces and Central States. Specimens were sent in by Miss Bostock from Monte Creek, and later it was seen growing there but not plentiful.

Mr. Groh (in MS.) reports it as "occasional in Dry Interior." According to Clark and Fletcher, "Farm Weeds of Canada," it occurs "principally in rich land around farm buildings and waste places. It does not often give trouble in cultivated fields." Being a near relative of the ragweeds its pollen may cause hay-fever in persons sensitive to pollen of that type.

Loesel's Mustard (*Sisymbrium Loeselii* L.) *Cruciferæ.*—This is a mustard of the Tumbling Mustard type (*Sisymbrium altissimum*) type, but not so strong growing, with shorter pods (about 1 inch long), deep yellow flowers, and the segments of the leaves shorter and broader. A native of Europe, it is apparently well established along the roadside and railway right-of-way east of Kamloops. It is an annual, and another mustard in an area where Tumbling Mustard is already so abundant probably will not make a serious difference to agriculture. At the same time, there is always the possibility of a newly introduced and unknown weed showing a special ability to adapt itself and multiply.

Crab Grass (*Digitaria sanguinalis* (L.) Scop.) *Gramineæ.*—This was reported from two or three places in Vancouver and Vancouver Island and was collected at Osoyoos. It is probably only likely to be troublesome in lawns and gardens.

WEEDS IN CLOVER-SEED.

Complaints having been received of certain weeds proving troublesome in red-clover seed grown in the Sumas area, a visit was made to this section with Mr. Tice on August 2nd and 3rd. The chief trouble appears to have been with rib-grass or English plantain (*Plantago laceolata* L.) the seed of which can only be removed from red-clover seed by a special process. It is classified as a secondary noxious weed in the Dominion "Seeds Act" and hence its presence beyond the small tolerance allowed means a serious cut in the price to the grower. Although rib-grass is a fairly common and widely distributed weed the amount present in most of the clover fields was surprisingly small, and with a little care in roguing it should be possible to prevent a recurrence of the trouble. Plants of this and other weeds were identified in the field for the growers and local persons interested.

"LITTLE CHERRY" DISEASE.

In the annual report for 1938 mention was made of this disease at Willow Point, in the Kootenay Lake area, and the fact that although the symptoms suggested some nutritional deficiency, applications of boron, copper, magnesium, iron, and zinc had given no results. Certain other minor elements supplied by Dr. McLarty and applied by E. C. Hunt had also proved negative. Although the possibility of the disease being of virus nature had not been overlooked, it had been thought best to try out all other practicable lines of approach first, in view of the serious difficulties in the way of making proper virus tests. It was agreed some time ago in a conference between Provincial and Dominion Plant Pathologists, that it was not in the public interest to bring virus diseases into any other district from that in which they naturally occurred, even for experimental purposes, if risk to crops of importance was incurred. This ruled out the Dominion Plant Pathological Laboratory at Summerland, the nearest research laboratory to the Kootenays. The fact that the only constant symptoms so far observed are in the fruit, renders the use of bearing trees necessary for inoculation tests. The use of such trees in commercial areas outside the affected zone is obviously inadvisable, while to carry on infection experiments within the area of natural spread would mean doing them on a considerable scale if reliable conclusions are to be drawn, with corresponding

expense of compensation to the owner if the disease proved to be transmissible; or alternatively, the purchase of an orchard for experimental purposes by the Government.

As the disease was reported to have extended its area considerably during 1939, a conference was held at Summerland in the spring of 1940 between the Provincial Plant Pathologist, the Provincial Horticulturist, and Dr. McLarty of the Dominion Plant Pathological Laboratory, Summerland, to consider what might be attempted during the current season. With the co-operation of the Consolidated Mining and Smelting Company, the Summerland laboratory has planted out an experimental cherry orchard at Columbia Gardens near Trail for use in inoculation experiments, but these trees will not be of much use until they come into bearing. Dr. McLarty and T. E. Lott, who has been working for some time past on the virus diseases of tree-fruits in the Okanagan, undertook to supply a quantity of cherry-leaf and cherry-fruit juice obtained by freezing and pressure, to be sprayed on " little cherry " trees about two weeks before maturity, to test the possible effect of the plant hormones on the developing fruit. E. C. Hunt, the District Horticulturist, furnished reports on the stage of development of the fruit. The Plant Pathologist and Assistant Plant Pathologist arrived in Nelson on June 17th and stayed until July 12th, mainly in connection with work on this disease.

Description of " Little Cherry"

The name " little cherry," which is in popular use, indicates the most striking symptom, and the one, of course, of most concern to the growers. As will be seen from the illustration (Fig. 1), size varies with the severity of the disease, but often averages around $^{23}/_{32}$ of an inch as against an average normal size of say $^{28}/_{32}$ to $^{30}/_{32}$ for the chief commercial varieties, e.g., Bing and Lambert. The shape of the affected fruit is inclined to be more angular and more pointed than normal, and the ripe fruit lacks sweetness and flavour. Many growers say that an affected tree can be picked out at a distance by the more conspicuous fruit clusters which are not hidden by the leaves. However, the latter are not noticeably smaller in size, but in some cases the fruit takes on a somewhat brick-red tint and with a dull instead of a glossy surface. In many cases the fruit is entirely below size for shipping and is left unpicked. In other cases a few may develop sufficiently for crate shipping and others be used for processing. In many cases a proportion of the fruit left on the tree will ripen after the normal picking season, but remains small and is said to be flavourless and lacking in sugar. The set is usually heavy, quite up to the normal standard for the variety. In the case of the Lambert in particular, unless frost-injury or some other unfavourable factor intervenes, almost every blossom seems to set. The size of the fruit, however, is not always completely determined by the presence of the disease, as affected trees with a light set may, in some cases, have larger fruit than ones with a heavy set.

The growth of the affected tree appears to be perfectly normal and vigorous when properly manured and cared for. Where the disease has rendered an orchard unprofitable, however, there is naturally a tendency for the owner to neglect it, which in turn somewhat complicates observation. There are certain leaf symptoms present on affected trees which do not seem to occur on healthy ones, in particular a faint ring mottling (hardly distinct enough to be called a ring-spot) which suggests a virus (Fig. 2). However, it appears to occur so irregularly and inconstantly that at present it can hardly be regarded as of diagnostic value. Closer observation over a longer portion of the season may however make leaf symptoms of more definite value.

No disease of similar character appears to have been recorded in the literature. Some growers think it must be the so-called " buckskin " disease recorded from California, but Dr. D. G. Milbrath, who made a survey of virus diseases of stone-fruits in British Columbia at the invitation of the Dominion Government in 1937, visited one of the worst affected orchards. Although he did not see it at fruiting-time, his careful inquiries as to symptoms convinced him that in any case it was not " buckskin."

Owing to the generally lighter set in 1940, even affected fruit may have sized better than usual, a fact to be considered in the interpretation of the figures which follow.

History.

" Little cherry " was first noticed in the Heddle orchard at Willow Point in 1933. In 1934 at least three other orchards in Willow Point appear to have had it, namely, those of Hugh Middleton, J. J. Campbell, and J. D. McDonnell. It now appears to be general over Willow

Point, and extensive at Longbeach and at Sunshine Bay across the Lake. A few trees are apparently affected at Procter, which seems to be the eastern limit, and in the other direction it occurs at an orchard near Taghum, west of Nelson. The districts of Creston, Gray Creek, Crawford Bay, and Robson appear quite free from it as yet. Kaslo, Mirror Lake, and Ainsworth also are presumed free, but one or two suspicious trees were noticed. In the absence of definite symptoms other than small and poor fruit, it is obviously difficult to be sure of the first occurrence of the disease as the odd off-crop tree may be due to some other condition, e.g., root-injury, a soil-pocket, etc.

Relative Susceptibility.

From inquiry and direct observation varieties may be roughly classified as follows: *Severely affected*—Lambert, Republican, Olivet; *moderately affected*—Bing, Deacon, Black Tartarian, Windsor, Montmorency, English Morello; *slightly affected*—Royal Anne. On the whole, late maturing varieties seem to show the disease most markedly.

Effect of Spraying with Juice of Cherry Leaves and Fruit.

These juices were obtained by freezing and pressure, and no chemicals used or added. This experiment was conducted in an orchard as uniform as could be located in soil, aspect, and age of trees. All trees in it are believed to be affected with "little cherry." A "plot" consists of at least one large limb. Each treatment was replicated four times, but no two "plots" of the same treatment are in the same tree; although one tree might have three or four "plots." Ten per cent. of juice with 90 per cent. of distilled water was used, except in the combined leaf and juice test in which the pure juice as expressed was used. The sprays were applied in a fine mist sufficient to moisten both leaf surfaces, but not enough to drip. Picked July 4th. Variety: Chiefly Lambert.

In picking, the entire plot was picked, mixed, fifty fruits taken at random, and the diameter measured with callipers graduated in 32nds of an inch, in which unit the results are expressed.

Treatment.	Date applied.	Average Diameter of 200 Cherries.
Check, no treatment	June 18	23.8
Check, distilled water	June 18	23.0
Lambert leaf juice	June 18	23.4
Bing leaf juice	June 18	23.3
Bing fruit juice	June 18	23.7
Carnival fruit juice	June 25	23.6
Combined leaf and fruit juice	June 25	22.7

There is no significant difference between any of these plots; in fact, the check (untreated) is as good as any.

Effect of Vitamin B_1.

For this purpose a commercial preparation of yeast extract sold by one of the horticultural supply firms in Vancouver was used. The strength recommended on the container is one drop per gallon. The spring applications were made by E. C. Hunt. Variety, Lambert. Picked: Willow Point, July 4th; Sunshine Bay, July 11th.

Place.	No. of Plots.	Treatment.	No. of Fruit measured.	Average Diameter of Fruit in 32nds Inch.
Willow Point	4	Check, no treatment	200	23.8
Willow Point	4	Check, distilled water	200	23.0
Willow Point	4	20 drops per quart sprayed on June 18th	200	23.7
Sunshine Bay	1	Check, no treatment	50	21.4*
Sunshine Bay	1	1 drop per gal.; 3 applications fortnightly in spring	50	24.4
Sunshine Bay	1	2 drops per gal.; 3 applications fortnightly in spring	50	24.3

* This tree had a very heavy set of fruit.

There are no significant differences in these results.

Effect of Fertilizers.

A number of fertilizer tests have been conducted in the area by the Fertilizer Division of the Consolidated Mining and Smelting Company, the District Horticulturist, and growers, with little result. Large and varying quantities of 16–20–0, 5–10–5, chicken manure, and nitrate of soda have been used. The following table expresses the results of one set of experiments (not replicated), conducted by Mr. Hunt at Mr. Sewell's, Sunshine Bay:—

Treatment.	No. of Trees.	Average Diameter of Fruit in 32nds Inch.	Weight in Oz. of 50 Fruit measured.
Nitrate of soda, 5 lb., fall and spring; iron sulphate, ½ lb.; zinc sulphate, ½ lb.; boric acid, ½ lb.; copper sulphate, ½ lb.; Vitamin B_1, three fortnightly applications in spring; lime	1	23.5	16
Nitrate of soda, 5 lb., fall and spring; lime	1	22.5	14
Nitrate of soda, 5 lb., fall; lime	2	22.7	15
Boric acid, ½ lb.; zinc sulphate, ½ lb.; iron sulphate, ½ lb.; lime	1	22.3	15
Lime only	2	25.6	19*
Nitrate of soda, 5 lb., fall and spring	1	23.8	16
Nitrate of soda, 5 lb., fall only	1	23.1	15
Check, no treatment	1	21.4	14

* One of these trees had a very light set.

There does not appear to be any significant difference in these results.

Although fertilizers and various minor elements in certain combinations have been tried with negative results, there is the possibility that there may be a deficiency of two or more minor elements simultaneously. In the fall of 1940, therefore, an application was made with five replications, in an orchard at Willow Point, of a rare element mix which in addition to N.P.K. contains iron, magnesium, sulphur, boron, manganese, copper, aluminium, lead, arsenic, zinc, cobalt, and limestone. A second application will be made in the spring and if no results are seen next year, this phase of the problem can be abandoned.

Soil Analyses.

As a further check on the above, Mr. Foster took soil samples at various places, including virgin soil, from healthy orchards and sites of recent and older infection. The results are given in the following table, the analyses being made by the Spurway method by Mr. J. M. McArthur of the Dominion Pathological Laboratory, Saanichton. The results are not correlated apparently with the presence or absence of the disease.

Source.	pH.	Nitrogen.	Phosphorus.	Potash.	Calcium.	Magnesium.	Iron.	Remarks.
Crescent Bay, 9 miles from Nelson	6.8	0	14	40	500	56	0	Virgin soil.
Willow Point, near Middleton	6.3	0	16	40	800	50	0	Virgin soil.
J. D. McDonnell, Willow Point	7.0	70	14	80	800	56	0	Early infection.
Hugh Middleton, Willow Point, Nelson	6.3	200	40	24	800	56	0	Early infection.
Sherradan, Ainsworth	6.9	250	16	40	800	56	0	Healthy.
Major Bros., Sunshine Bay, R.R. 1, Nelson	7.0	80	14	24	800	56	0	Recent.
Mrs. J. Milton, Mirror Lake	6.7	250	20	40	800	56	0	Healthy.
Appleton Bros., Sunshine Bay, R.R. 1, Nelson	8.0	40	10	40	1,200	56	0	Recent.
J. J. Campbell, Willow Point, Nelson	6.3	80	20	40	500	56	0	Early infection.
J. D. Kerr, Longbeach, Nelson	6.5	20	60	60	800	56	20	Later.
J. Sewell, Sunshine Bay, R.R. 1, Nelson	6.8	40	20	160	500	56	0	Later.
A. West, Kaslo	8.2	80	4	24	100	50	0	Healthy.
A. West, Kaslo	6.8	200	20	24	500	50	0	Healthy.
Normal values	5–7	50–150	15–30	30–100	900–1,300	40–60	....	

Possibility of Virus.

In 1937, branches of trees of Bing, Lambert, and Republican affected by typical "little cherry" were sent to Dr. Newton, of the Dominion Pathological Laboratory, Saanichton, for transfer experiments. Buds were put on to mazzard stock. In 1938 these budded plants showed no positive symptoms. In view of the paucity of symptoms outside of the fruit, this is not surprising. The objection to bringing possible virus infection into a free district has been discussed already. However, cherries are not a very important commercial crop in the Saanich area and the Dominion Experimental Station is somewhat isolated. Moreover, the adjacent Dominion Pathological Laboratory has maintained a cherry nursery for virus tests for some years past. The acting superintendent of the Station, E. R. Hall, therefore has kindly given permission to use some of the mature trees in the orchard there. Buds from affected trees at Willow Point were accordingly budded into fruiting Lambert trees on July 31st. Here they can be kept under close observation. If the disease is of virus nature results may be obtained when the fruit matures next year.

BUNT INVESTIGATION.

The following is a summary of the report of W. R. Foster, Assistant Plant Pathologist:—

"Tests on resistance to soil-borne infections are being continued at Armstrong. A considerable number of new hybrid wheats have been obtained and sown this fall.

"The plots to test the effect of different dates of seeding on amount of bunt at Armstrong show the following results:—

Date of Seeding.	No. of Smutted Heads.
September 5th	34*
September 15th	394
September 25th	365
October 5th	425
October 15th	558

* The yield on this plot was very poor.

"Results over a period of years will be necessary before conclusions of a practical nature can be drawn. Plots have again been set out, this time in quadruplicate. An experiment has been laid out at Saanichton to test the value of a considerable number of seed treatments against soil-borne bunt infection. As a preliminary a large number of chemicals were tested at different concentrations for their effect on germination. As these results may be of interest to others studying the problem of seed treatment it is thought desirable to give them here.

Tolerance of Wheat to Chemical Treatment.

(Seed soaked 24 hours. Germination tests replicated three times at room temperature (about 70° F.).)

Chemical.	Germination. Per Cent.	Vigour on Scale, 0–10.
O-nitrochlorobenzene, saturated	100.0	2.0
O-nitrochlorobenzene, one-half saturated	100.0	5.0
O-nitrochlorobenzene, one-quarter saturated	100.0	8.0
P-nitrochlorobenzene, saturated	100.0	9.0
P-nitrochlorobenzene, one-half saturated	100.0	9.5
P-nitrochlorobenzene, one-quarter saturated	100.0	9.5
Bromobenzene, saturated	100.0	9.0
Bromobenzene, one-half saturated	100.0	9.0
Bromobenzene, one-quarter saturated	100.0	9.5
Benzaldehyde, saturated	0.0	0.0
Benzaldehyde, one-half saturated	0.0	0.0
Benzaldehyde, one-quarter saturated	76.0	5.0
Trichloroethylene, 0.2 cc. in 100 cc. water	100.0	9.0
Trichloroethylene, 0.1 cc. in 100 cc. water	100.0	9.0
Trichloroethylene, 0.05 cc. in 100 cc. water	100.0	9.0
Paraldehyde, 3.0 cc. in 100 cc. water	0.0	0.0

TOLERANCE OF WHEAT TO CHEMICAL TREATMENT—*Continued.*

Chemical.	Germination. Per Cent.	Vigour on Scale, 0–10.
Paraldehyde, 2.0 cc. in 100 cc. water	0.0	0.0
Paraldehyde, 1.0 cc. in 100 cc. water	99.5	9.5
Aniline, 0.2 cc. in 100 cc. water	99.0	3.0
Aniline, 0.1 cc. in 100 cc. water	100.0	5.0
Aniline, 0.05 cc. in 100 cc. water	100.0	7.0
Benzene, 0.2 cc. in 100 cc. water	100.0	9.0
Benzene, 0.1 cc. in 100 cc. water	100.0	9.0
Benzene, 0.05 cc. in 100 cc. water	100.0	9.0
Amylacetate, 0.2 cc. in 100 cc. water	100.0	9.0
Amylacetate, 0.1 cc. in 100 cc. water	100.0	9.0
Amylacetate, 0.05 cc. in 100 cc. water	100.0	9.5
Xylene, 1.0 cc. in 100 cc. water	89.5	9.0
Xylene, 0.5 cc. in 100 cc. water	100.0	9.5
Xylene, 0.2 cc. in 100 cc. water	100.0	9.5
Xylene, 0.1 cc. in 100 cc. water	100.0	9.5
Iso-propyl alcohol, 3.0 cc. in 100 cc. water	100.0	9.5
Iso-propyl alcohol, 2.0 cc. in 100 cc. water	100.0	9.0
Iso-propyl alcohol, 1.0 cc. in 100 cc. water	98.5	9.5
Nitrobenzene, saturated	99.0	5.0
Nitrobenzene, one-half saturated	100.0	6.0
Nitrobenzene, one-quarter saturated	100.0	7.0
Thymol, saturated	0.0	0.0
Thymol, one-half saturated	94.0	3.0
Thymol, one-quarter saturated	99.0	5.0
P-aminobenzene sulfonylamide, saturated	100.0	7.0
P-aminobenzene sulfonylamide, one-half saturated	100.0	7.0
P-aminobenzene sulfonylamide, one-quarter saturated	100.0	7.0
Acetamide, saturated	100.0	7.0
Acetamide, one-half saturated	100.0	8.0
Acetamide, one-quarter saturated	100.0	9.0
Dimethylamido-benzaldehyde, saturated	90.0	6.0
Dimethylamido-benzaldehyde, one-half saturated	100.0	7.0
Dimethylamido-benzaldehyde, one-quarter saturated	100.0	8.0
Carbon disulphide, saturated	100.0	7.0
Carbon disulphide, one-half saturated	100.0	7.0
Carbon disulphide, one-quarter saturated	100.0	7.0
Ethylene dichloride, saturated	100.0	7.0
Ethylene dichloride, one-half saturated	100.0	7.0
Ethylene dichloride, one-quarter saturated	100.0	7.0
Sec. Butylcarbinol, saturated	99.0	4.0
Sec. Butylcarbinol, one-half saturated	100.0	6.0
Sec. Butylcarbinol, one-quarter saturated	100.0	7.0
Ethyl formate, saturated	0.0	0.0
Ethyl formate, one-half saturated	0.0	0.0
Ethyl formate, one-quarter saturated	95.0	7.0
Carbon tetrachloride, saturated	100.0	5.5
Carbon tetrachloride, one-half saturated	100.0	9.0
Carbon tetrachloride, one-quarter saturated	100.0	9.5
Sodium acetate, 1.0 molar	24.0	5.0
Sodium acetate, 0.1 molar	100.0	8.0
Sodium acetate, 0.01 molar	100.0	9.5
Sodium arsenite, 1.0 molar	0.0	0.0
Sodium arsenite, 0.1 molar	0.0	0.0
Sodium arsenite, 0.01 molar	0.0	0.0
Sodium borate, 1.0 molar	67.0	0.5
Sodium borate, 0.1 molar	100.0	7.0
Sodium borate, 0.01 molar	100.0	9.5
Sodium carbonate, 1.0 molar	0.0	0.0
Sodium carbonate, 0.1 molar	90.0	7.0
Sodium carbonate, 0.01 molar	100.0	9.0
Sodium chloride, 1.0 molar	0.0	0.0
Sodium chloride, 0.1 molar	100.0	6.0
Sodium chloride, 0.01 molar	100.0	9.5
Sodium citrate, 1.0 molar	6.0	2.0
Sodium citrate, 0.1 molar	52.0	5.0

TOLERANCE OF WHEAT TO CHEMICAL TREATMENT—*Continued.*

Chemical.	Germination. Per Cent.	Vigour on Scale, 0–10.
Sodium citrate, 0.01 molar	100.0	6.0
Sodium ferrocyanide, 1.0 molar	0.0	0.0
Sodium ferrocyanide, 0.1 molar	5.0	2.0
Sodium ferrocyanide, 0.01 molar	62.0	4.0
Sodium fluoride, 1.0 molar	0.0	0.0
Sodium fluoride, 0.1 molar	0.0	0.0
Sodium fluoride, 0.01 molar	0.0	0.0
Sodium hydroxide, 1.0 molar	0.0	0.0
Sodium hydroxide, 0.1 molar	8.0	2.0
Sodium hydroxide, 0.01 molar	100.0	7.0
Sodium bicarbonate, 1.0 molar	0.0	0.0
Sodium bicarbonate, 0.1 molar	85.0	5.0
Sodium bicarbonate, 0.01 molar	100.0	9.0
Water	100.0	8.0

LEAF-MOULD OF TOMATOES.

Varietal tests of varieties of greenhouse tomatoes reported to be resistant to the leaf-mould fungus have been conducted for a number of years. Most of the varieties tested showed considerable resistance to the disease but were unsatisfactory from some other standpoint. A recent introduction from the Horticultural Experiment Station, Vineland, Ontario, called "Vetomold" offers some promise. The result of spring and fall tests at a number of greenhouses have shown that this variety is not only very resistant to leaf-mould, but is also of good quality and yields well. It is rapidly replacing "Best of All," the usual variety grown for many years. Unfortunately, a report from Ontario states that "Vetomold" is very susceptible to at least one strain of the leaf-mould fungus present there. It is impossible to say therefore how long "Vetomold" will continue to remain resistant in British Columbia.

REPORT OF PROVINCIAL ENTOMOLOGIST.

MAX H. RUHMANN, PROVINCIAL ENTOMOLOGIST.

The entomological conditions in the Interior of British Columbia that came particularly to our attention during 1940 were of particular importance concerning the following insects of economic importance:—

The Colorado Potato-beetle (Leptinotarsa decemlineata).—At Grand Forks a slight increase occurred in 1940, but infestation appears to be well in hand. No beetles have been found or reported at Thrums and Salmo since 1938. A full report of the work on this outbreak has been submitted.

The Alfalfa Semi-looper (Autographa californica).—An outbreak of this insect occurred in the Hammond Gardens section of the west end of the Grand Forks Valley. After the cutting of the first crop of alfalfa the larvæ migrated to adjoining truck-crops, attacking particularly carrots and onions. Little damage was done as the affected area was thoroughly treated with an arsenical dust.

The Thistle Butterfly (Vanessa cardui).—An unusual outbreak of this butterfly occurred in the Rock Creek area which caused some alarm to farmers. Investigation of this outbreak indicated that it originated in an extensive area of Tar Weed (*Madia* sp.) on the higher range land near Bridesville. No serious damage occurred.

The Variegated Cutworm (Lycophotia margaritosa).—An outbreak of this insect was general throughout the Interior, being most severe through the Slocan Valley and the Nelson District.

The Codling-moth (carpocapsa pomonella).—A considerable increase in the severity of infestation occurred throughout the Okanagan Valley. An extension of the infested area at Salmon Arm was also reported, and in this area the Co-operative Growers are organized to combat this outbreak with the object of its eradication in the district.

The Dominion Entomological Branch at Vernon is making continuous studies of this pest with the object of improving control measures.

The Onion-thrips (Thrips tabaci).—Infestation by this thrips was more extensive than last year in Grand Forks, attacking particularly onions and carrots. Considerable dusting was done to control this insect, but application in most instances was too late to be effective.

Wireworms (Elateridæ).—As usual, wireworms were plentiful at Grand Forks and reduced onion and potato crops. Some excellent results were obtained by trapping with potatoes in small gardens, but this method of control is not practical under commercial crop conditions.

The Seed-corn Maggot (Hylemyia cilicrura).—This insect was recorded in the Lavington District near Vernon last year. The area of infestation was further extended this year in the same district. Beans appear to be the only crop so far affected.

The Pea-weevil (Mylabris pisorum).—Peas were distributed by the cannery at Grand Forks to a number of local growers for seeding for canning purposes, but infestation by the weevil was so severe in some fields that the crop had to be destroyed.

The Box-elder Bug (Leptocoris trivittatus).—The usual number of complaints were received on this insect. The plantings of the Box Elder, or Ash Leaved Maple (*Acer negundo*), are quite general and extensive for shade in the Interior. Consequently this insect is general and is a nuisance in the fall when it migrates to hibernating-quarters in sheds and houses. This insect is known to attack other maples and various fruit-trees, but so far no injury to fruit has been recorded in the Interior.

The Corn-ear Worm (Heliothis obsoleta).—This insect is also known as the Cotton Boll Worm in the south. Its distribution is general throughout much of the tropical and temperate regions of the world. Occasionally this insect is reported in the Okanagan Valley and other Interior points. It has numerous host plants ranging from fruit-trees to field and truck crops as well as garden plants. This pest has been known in the Interior for over twenty years but has only been recorded on corn. It pupates and winters in the ground but does not seem to easily survive our winters.

The Gladiolus Thrips (Tæniothrips simplex).—A severe outbreak on a commercial gladiolus planting was found this year in Vernon. Practically no blooms were harvested. An outbreak was also reported in a commercial planting at Kelowna.

The False Chinch Bug (Nysius ericæ).—This insect was found migrating from an alfalfa field, after the cutting of the first crop, to a near-by potato field. The outer rows of the potatoes were severely injured. This outbreak was quite local and no general injury occurred.

The Pacific Mite (Tetranychus pacificus).—This mite was reported for the first time in the Interior last year as a local outbreak by officers of the Dominion Entomological staff. Although it has slightly extended its distribution it is still confined to the one district.

REPORT OF PROVINCIAL APIARIST.

A. W. Finlay, Provincial Apiarist.

The weather conditions which existed during the winter of 1939–40 were very favourable to bees, just cold enough, most of the time, to keep them well clustered, but occasionally becoming warm enough to allow the bees a necessary cleansing flight. The consumption of winter stores was consequently light. The unusually fine weather of February and March brought the bees out in full activity and brood-rearing began in earnest as soon as the first nectar was available from the willows. There were the usual spring losses from colonies where insufficient stores were left for wintering, or, rather, spring brood-rearing, the heaviest losses in this respect being in Vancouver Island District. The total winter mortality for the Province was less than 15 per cent. With the advent of the honey-flow from dandelions and fruit-bloom, colonies quickly built up to storing strength.

The continued fine weather, although ideal for bee-flight and, for a time, honey secretion, was not ideal for the main honey-flow occurring in July from the clovers. Conditions were exceedingly dry in July and August and at no time did the bees make any appreciable gains on the scale hives. However, the flow was continuous with a gain of from 2 to 3 lb. a day over a period of six weeks, gradually tapering off toward the middle of August when the honey-flow ceased.

ESTIMATE OF HONEY-CROP FOR 1940.

In the Interior, the crop was very uneven. In some districts, such as Similkameen, the effect of spray poisoning weakened the field force of bees to the extent that little surplus was gathered, while in others the crop variation could only be accounted for by atmospheric conditions affecting humidity. The crop was fair in the aggregate. The total crop for the Province was estimated at 1,264,050 lb., being an increase of about 20 per cent. over that of last year. Appended herewith is the estimate of the honey-crop by districts:—

District.	Apiaries.	Hives.	Honey-crop.	Average.
				Lb.
Vancouver and Gulf Islands	660	2,500	100,000	40
Greater Vancouver	451	2,400	96,000	40
Lower Fraser	756	6,550	393,000	60
Upper Fraser and Chilliwack	357	2,825	141,250	50
Okanagan, Shuswap, Thompson	600	4,810	384,800	80
Kootenays	213	1,700	119,000	70
Central Interior	33	500	30,000	60
Total	3,070	21,285	1,264,050	59

FIELD-WORK.

Field-work began with the usual preliminary inspection of apiaries where disease had previously been found, and checking over colonies that had died during winter. Much of this work can be done before bees become very active and, in many cases, the opportunity is given to clean up potential sources of infection by destroying dead colonies before being robbed. Fine spring weather enabled the Inspectors to get well ahead with their field-work. The annual visits of your Provincial Apiarist to Interior points had to be cancelled owing to severe illness, but the Creston area was inspected by E. R. Freeman, who reported 582 colonies examined; six of these being affected with American foul-brood, and were promptly destroyed.

Systematic apiary inspection was carried on in all districts where disease was prevalent. A considerable reduction in the percentage of disease is noticeable in the Greater Vancouver area over a period of several years. In this respect, the work of the local Inspector, W. J. H. Dicks, is to be highly commended, together with the co-operative assistance of several willing helpers, leading bee-keepers of the district.

The following is a summary of the field-work done in the various districts:—

Inspector.	District.	Estimated.		Disease A.F.B.
		Apiaries.	Colonies.	
W. J. H. Dicks	Greater Vancouver	330	1,161	37
E. R. Freeman	Lower Fraser Valley and Creston	448	1,963	217
J. Gillespie	Vancouver Island	326	1,892	13
H. L. Johnson	Upper Fraser Valley	274	1,363	39
J. F. Roberts	Okanagan	223	1,894	43
J. A. Smith	South Okanagan	51	574	41
Totals		1,652	8,847	390

Applications for registration of 293 new apiary locations were received and 118 cancellations were recorded, leaving a registration list of 4,457.

Correspondence included the receipt of 693 letters and 741 were sent out.

Microscopic examination of samples of diseased comb and smears sent in for diagnosis were made and reports sent out with instructions for treatment where necessary.

Other office-work consisted of interviewing visiting bee-keepers, supervision of Inspectors' reports and accounts, telephone calls and departmental reports.

Your Provincial Apiarist desires to express his sincere appreciation to the members of the staff for their aid in carrying on the office routine during his severe illness.

The honey section at the Vancouver Exhibition was, beyond question, the largest yet shown in Vancouver. About 100 feet of extra table frontage was required to display all the exhibits. There were actually 5 per cent. less entries than last year, but owing to modifications and changes in the prize-list there were more of the attractive displays encouraged and less of the non-attractive bulk class, this being in line with the policy of the Exhibition Association to make the displays as interesting as possible to the public and with the members of the Associated Bee-keepers to use the Exhibition as the show-window to display their products. Following the success of last year in disposing of their honey, the bee-keepers again this year sold most of the displays as exhibited, besides taking orders for many tons of honey. The quality was very even and excellent. It lacked the wide variation of last year's exhibits and for this reason, judging was closer and more difficult.

At Victoria, there was a distinct falling off this year of the number of entries in the honey section, no doubt due to the light crop on the Island, owing to dry weather. Most of the honey shown was from the fireweed districts and was of very fine quality. It was well staged and quite attractively arranged.

A number of smaller Fall Fairs featured honey to some extent and, where necessary, were judged by the District Apiary Inspector.

At the request of officials of the Washington Bee-keepers' Association your Provincial Apiarist attended a series of meetings at Burlington and Woodinville, where a three-day school for bee-keepers was carried out. Addresses were given suitable to the subject and practical instruction, as far as possible with models, in addition to lantern lectures.

A number of bee-keepers' winter meetings were attended in Vancouver and addresses given. The moving-picture film, " Bee-keeping in British Columbia," prepared by the Department of Agriculture, was very much appreciated wherever shown. Attendance of the Apiary Inspectors at the various field-days held during the summer was greatly appreciated, as their practical demonstrations of many phases of bee culture were of educational value.

REPORT OF FIELD CROPS BRANCH.

CECIL TICE, B.S.A., COMMISSIONER.

The winter of 1939–40 was very mild and fall-sown crops came through in good condition. There was ample moisture in the spring, but due to the prolonged drought during the growing season, both spring and fall sown crops generally yielded below average. The corn-crop, however, withstood the dry conditions much better and gave a greater tonnage than in 1939.

Potatoes and root-crops produced average yields. Pastures also suffered from the dry spell and farmers had to supplement the grass with other feeds at a comparatively early date.

Hay-crops were generally good and haymaking conditions were satisfactory.

Seed-crops varied considerably but, on the average, production was normal and prices are generally a little better than last year.

B.C. FIELD CROP UNION.

This organization, of which your Commissioner is the Secretary-Treasurer, has just completed its seventh year. Steady progress has been made since its inception and the Union enjoys the fullest co-operation of the University of British Columbia and the Provincial and Federal Departments of Agriculture.

Although there has been a decrease in membership during the year, interest in the association's work has been well maintained and the finances of the organization are in satisfactory condition.

During the year, thirty-three different tests were available to the membership. These covered cereals, legumes, grasses, potatoes, and fertilizers.

The annual meeting for the year 1939 was held at Chilliwack, on March 6th, 1940. This proved very successful.

The association issues a printed annual report where full details are given of its activities.

CORN TEST-PLOTS.

The test-plots with hybrid and standard varieties of corn were continued and extended during the year in co-operation with Dr. S. E. Clarke, of the Dominion Experimental Farm, Swift Current, Saskatchewan.

These tests are proving of considerable value in not only ascertaining the suitability of hybrid corn for planting for ensilage purposes, but also in extending corn plantings. The Live Stock Commissioner has frequently stated that corn should be used to a greater extent than it is at the present time for stock-feeding.

British Columbia imports large quantities of grain corn annually for poultry-feeding and it would seem desirable to investigate the possibilities of producing such corn in this Province. In the Interior, in particular, grain corn can be satisfactorily produced and a large farmer at Grand Forks is planning on supplying a part, at least, of the market requirements. It would seem to be largely a matter of cost of production and if British Columbia farmers can produce grain corn as cheaply as the imported product they should take advantage of this.

The following is a list of the districts in which the tests were located and the number of tests in each area is indicated:—

	Tests.
Vancouver Island	5
Fraser Valley	2
Cariboo	2
Interior	5
Boundary	1
Total	15

The hybrid and standard varieties of corn used in these tests were as follows: Rainbow Flint, North West Dent (Morden), Minnesota 13 (Worthy), A3-NK hybrid, E2-NK hybrid, M-NK hybrid, D-NK hybrid, FB-NK hybrid, Wisconsin 606 hybrid, Wisconsin 525 hybrid, Wisconsin 570 hybrid, Wisconsin 455 hybrid, Wisconsin 355 hybrid, Falconer, North West Dent (Lethbridge), Golden Glow, Algonquin, and Silver King.

Wherever possible the green weights were taken on a given area at harvest-time. Samples were also submitted whenever considered desirable to Dr. S. E. Clarke for dry-matter test. At the time of preparing this report the results are incomplete for publication.

It should be pointed out that the tests in the Cariboo were under the immediate supervision of G. A. Luyat in the early part of the season and of Dr. W. T. Carlyle later; whilst the the tests in the Okanagan were under the direct supervision of M. S. Middleton, District Horticulturist, Vernon.

DISTRICT SEED FAIRS.

Three district seed fairs were again conducted. These were located at Armstrong, Dawson Creek, and Prince George. The latter fair is under the direct supervision of the Central B.C. District Agriculturists. The Dawson Creek and Armstrong Seed Fairs were held as part of the local agricultural association's Fall Fair. These fairs serve a useful purpose in not only getting farmers together to discuss matters of common interest, but also in bringing to their notice the value of good seed of standard varieties.

No Provincial Seed Fair was held, but a privately operated Provincial Potato Show was held in Vancouver in November, at which your Commissioner assisted with the judging. This fair proved very successful. There were a large number of exhibitors and the fair was well patronized.

CHICAGO INTERNATIONAL HAY AND GRAIN SHOW.

Several of our farmers as usual availed themselves of the opportunity to exhibit at this Exhibition. The Department of Agriculture assists exhibitors by paying the transportation charges on exhibits.

Mr. John Decker, of Pemberton, again distinguished himself by capturing the field-pea championship with the Stirling variety. Altogether British Columbia exhibitors captured three first prizes, namely, timothy, field peas, and rye. This is a very creditable performance considering the comparatively small number of exhibitors from this Province and the distance. The complete list of British Columbia winnings follow:—

Timothy.—1, E. Norman Bree, Telkwa, B.C.

Rye.—1, M. S. Middleton, Vernon, B.C.; 8, W. S. Simpson, Sweetwater, B.C.

Hard Red Spring Wheat.—4, Gordon Gibson, Ladner, B.C.; 10, Mrs. A. Kelsey, Erickson, B.C.; 20, W. S. Simpson, Sweetwater, B.C.

Large Yellow Field Peas.—1, J. Decker, Pemberton, B.C.; 3, W. S. Simpson, Sweetwater, B.C.

Champion Sample of Field Peas (Large Yellow).—J. Decker, Pemberton, B.C.

FIELD CROP COMMITTEE.

One meeting of the B.C. Field Crop Committee has been held during the year and information of value pertaining to field crops has been prepared. This serves as a useful basis in the planning of crop projects.

In co-operation with the District Agriculturists and Horticulturists a report was prepared during the year showing the acreage and varieties of cereals produced in the various areas of the Province.

The variety tests being carried on under the supervision of Federal officials were extended during the year. The results of these tests are on file in this office.

PURE-STOCK SEED.

The pure-stock seed work with cereals started at the University of B.C. in 1938 performs a useful service. The following quantities of seed were made available to farmers this year:—

	Lb.
Prolific Rye	357
Chancellor Peas	535
Victory Oats	1,021
Alaska Oats	455
Marquis Wheat	1,508
Olli Barley	384
Kharkov Wheat	235
Dawson's Golden Chaff Wheat	430
Jones' Fife Wheat	420
Storm Rye	290

This seed is made available to farmers of the Province by the Provincial Department of Agriculture and the B.C. Field Crop Union at a special price.

During the year a field-day was held at the University, to which farmers, business-men, and Government officials were invited. Dr. Moe explained the nature of the work being undertaken and outlined the process of producing pure-stock seed.

CROP COMPETITION.

One combined Field Crop and Cleaned Seed Competition was held during the year. This took place with potatoes as the crop in the Pemberton District, and considerable interest was displayed. The competition was judged by H. S. MacLeod and his staff of the Federal Seed Potato Certification Service, from whom we have always received splendid co-operation.

GRASS DRYING.

The drying of grass for both animal and human consumption is one of the latest developments and promises to be of extreme importance in the not far distant future.

In the Fraser Valley, where the climate and soil seem to be particularly adapted for the production of grass, a well-known company has been operating two grass-drying plants with considerable success. With the approval of the Honourable K. C. MacDonald, Minister of Agriculture, your Commissioner visited one of these grass-drying plants in the summer.

SEED-DRILL SURVEY.

The seed-drill survey was carried on in two districts during the year by the joint Provincial and Federal Departments of Agriculture. The districts referred to are the Peace River Block and Okanagan.

This survey consists in the taking of 1-lb. samples of the cereal seed the farmer intends to sow, direct from the seed-drill or bin, by Provincial officials. These in turn are submitted to

the Federal Seed Laboratory for analysis. In due course the results are tabulated and made available to the individual farmers, and practical suggestions are made by the District Agricultural officials in regard to improving their seed.

The complete results of the 1940 survey are on file in the Field Crops Office, but a brief summary is given below:—

	No.
Samples examined	78
Samples grading No. 1	35
Samples grading No. 2	20
Samples grading No. 3	6
Samples rejected	17

It will be observed from the above data that nearly 25 per cent. of the samples examined were rejected; that is to say, they would not conform to any of the grades laid down in the "Dominion Seeds Act."

FIBRE-FLAX.

In co-operation with the Agricultural Production Committee and the Provincial Markets Branch, this office has given considerable study to fibre-flax production. A special circular was issued for use at the Sixth Biennial Convention of Women's Institutes. In addition to this your Commissioner has attended several meetings when the subject of fibre-flax has been discussed.

Information has been assembled by this office relative to flax-fibre production, so that we may have the fullest data on the subject. In this regard special mention should be made of the information received from the Federal Flax Fibre Division and the Agassiz Experimental Farm.

With the cutting-off of European supplies of fibre-flax and fibre-flax seed, Ireland is looking to this country for much of its supplies. Considerable development has taken place during recent years along this line in both Ontario and Quebec. It is felt, however, that the Fraser Valley in this Province, which can produce high-quality fibre-flax, offers possibilities. It is planned to carry on tests in various parts of the Province next year. The co-operation of the Federal Flax Fibre Division has been promised in this undertaking, more particularly in connection with the processing of the crop.

SEED PRODUCTION.

In co-operation with the Dominion Plant Products Division, assistance continues to be rendered in promoting field crop seed production. Reports received from various sources have indicated that our red clover and alfalfa seed often lacked winter hardiness when used in other places. As a result of this, efforts are being made to replace our present stocks of alfalfa and red clover with high-grade seed of more winter hardy strains.

Last spring the Federal and Provincial Departments of Agriculture distributed several hundred pounds of the Ottawa strain of two-cut red clover and of registered Grimm alfalfa-seed to farmers in those areas where seed production has assumed commercial proportions.

Sugar-beet and root-seed production generally has received increased attention due to the cutting off of European supplies.

Your Commissioner has kept in close touch with the sugar-beet experimental work being undertaken on Vancouver Island by the Federal and Provincial Departments of Agriculture, and also by a well-known feed and seed company in the Fraser Valley. Some really splendid work is being undertaken in both of these areas, which should result in some very interesting information being obtained as to the suitability of the Coast areas for sugar-beet seed production and the possibilities of this Province being able to compete with other parts of the North American Continent.

Canadian sugar-beet companies require large quantities of sugar-beet seed annually for their needs, and if British Columbia can supply all or at least part of their requirements it will be another useful agricultural side-line.

Limited quantities of Creeping Red Fescue and Orchard grass were also distributed as it was felt that the production of these seeds should receive encouragement in this Province.

In the root-seed work, more particularly, the co-operation of John Webster, who was appointed to the Horticultural Branch early in the year to assist in vegetable-seed promotion, is much appreciated.

As the 1940 statement showing the quantities of field-crop seeds will not be complete for several weeks, the 1939 statement, exclusive of cereals, is given below.

	Lb.
Alsike and Timothy	100,000
Alsike	50,000
Red Clover	190,000
Alfalfa	160,000
Timothy	1,000,000
Mangel	6,969
Crested Wheat Grass	3,600
Creeping Red Fescue	1,000
Reed Canary Grass	610
Field Corn	6,000

WEED-CONTROL.

Educational work in connection with weed-control has been carried on during the year and two Weed Inspectors—namely, Messrs. Mixer and Foster—were reappointed for seasonal weed-inspection work in the Peace River Block.

The Provincial Police, municipalities, and Public Works Engineers were sent circular letters calling attention to the need for better control of weeds, more particularly in those districts where seed-growing is being carried on, and much valuable co-operation was received from these sources.

Weed posters illustrating some of the worst weeds have been sent out from time to time. Municipalities and the Provincial Public Works Department have been contacted relative to the spraying of weeds on roadsides and much useful information has been given to both of these organizations relative to this subject.

J. W. Eastham, Provincial Plant Pathologist, and your Commissioner personally contacted a number of farmers in the Sumas area who are producing red-clover seed and brought to their attention the worst weeds found in that area. Emphasis was placed on the value of roguing of fields during the growing season before the weeds go to seed. Bad weeds, such as Rib-grass or English Plantain, are very difficult to remove in the process of seed-cleaning and the pulling of them by hand during the growing season before they go to seed would seem to offer the best solution to the problem.

Several of the District Agriculturists and Horticulturists have again been supplied with chemicals to enable them to carry on demonstrations in weed-control in their districts. Chemicals which have been used are sodium chlorate, Atlacide, Stephen Weed-killer, and activated carbon bisulphide.

The results of tests conducted in the Okanagan are given in the annual report of H. H. Evans, and are quoted here:—

"WEEDS: LEAFY SPURGE AND MORNING GLORY.

"*Carbon bisulphide* (2 oz. per set, 18 by 18 inches).—Applied July 3rd. Leafy Spurge, 99 per cent. killed; Morning Glory, 98 per cent. killed.

"*Stephen Weed-killer, Formula C* (Sodium chlorate 125 lb., ammonium sulphate 200 lb., fine salt 15 lb., water 100 gal.).—Applied July 3rd. Leafy Spurge, 70 per cent. killed; Morning Glory, 97 per cent. killed.

"*Sodium chlorate* (1 lb. to 1 gal. water). Applied July 3rd. Morning Glory, 75 per cent. killed.

"NOTE.—The above two sprays were applied at the rate of 375 gal. per acre. Soil-moisture subnormal. One application only was made for each weed. Plots were checked July 30th and September 24th, 1940.

"WEED: PERENNIAL SOW THISTLE.

"*Carbon bisulphide* (2 oz. per set, 18 by 18 inches). Applied July 3rd. Perennial Sow Thistle, 40 per cent. killed; active second growth on balance.

"*Sodium chlorate* (1 lb. to 1 gal. water).—Applied July 3rd. Perennial Sow Thistle, 85 per cent. killed; partial late second growth quite weak.

"*Stephen Weed-killer, Formula E* (Sodium chlorate 100 lb., ammonium sulphate 100 lb., fine salt 10 lb., water 100 gal.).—Applied July 3rd. Perennial Sow Thistle, 95 per cent. killed; weak late second growth; Canada Thistle, 95 per cent. killed.

"NOTE.—Soil was a peat muck, quite porous. It may be possible that a percentage of carbon bisulphide evaporated before control occurred. Soil-moisture good. Plots were checked July 30th and September 24th, 1940. One application only was made for each weed.

"WEEDS: CANADA THISTLE AND TWITCH GRASS.

"*Carbon bisulphide* (2 oz. per set, 18 by 18 inches).—Applied July 4th. Twitch Grass, 75 per cent. killed; Canada Thistle, 95 per cent. killed.

"*Carbon chlorate* (1 lb. to 1 gal. water).—Applied July 4th. Twitch Grass, 60 per cent. killed; Canada Thistle, 98 per cent. killed.

"*Stephen Weed-killer, Formula C* (Sodium chlorate 125 lb., ammonium sulphate 200 lb., fine salt 15 lb., water 100 gal.).—Applied July 4th. Twitch Grass, 80 per cent. killed; Canada Thistle, 98 per cent. killed.

"*Stephen Weed-killer, Formula A* (Sodium chlorate 40 lb., ammonium sulphate 40 lb., fine salt 4 lb., water 100 gal.).—Applied July 4th. Canada Thistle, 55 per cent. killed.

"NOTE.—This soil was a heavy clay loam, surface 4 inches dry, subsoil-moisture good. Above two sprays applied at rate of 450 gal. per acre. Plots checked July 20th and August 24th, 1940.

"WEEDS: RUSSIAN KNAPWEED AND TWITCH GRASS.

"*Carbon bisulphide* (2 oz. per set, 18 by 18 inches).—Applied July 4th. Russian Knapweed, 100 per cent. killed; Twitch Grass, 80 per cent. killed.

"*Sodium chlorate* (1¼ lb. to 1 gal. water).—Applied July 4th. Russian Knapweed, 98 per cent. killed; Twitch Grass, 70 per cent. killed.

"*Stephen Weed-killer, Formula C* (Sodium chlorate 125 lb., ammonium sulphate 200 lb., fine salt 15 lb., water 100 gal.).—Russian Knapweed, 100 per cent. killed; Twitch Grass, 70 per cent. killed.

"NOTE.—Plots checked August 7th and September 24th, 1940.

"A plot was also sprayed with one-half strength of Formula C as a check. This was not good and is not recorded. There was a partial kill on Knapweed and very slight kill on Twitch Grass. Soil, clay loam; moisture, fairly good. The area which contained the plots had received a cultivation about two weeks prior to control applications."

THOMSON NETTED GEM SEEDLING POTATO.

Acting on instructions received from the Deputy Minister, extensive tests were conducted during the year with samples of the Thomson Netted Gem Seedling potato. This potato was developed by W. H. Thomson, of Revelstoke.

Tests were conducted at the Dominion Experimental Farms at Ottawa, Agassiz, Saanichton, Smithers, and Lethbridge; also by numerous farmers.

Reports received to date would indicate that this potato is practically the same as the standard Netted Gem as far as shape and general characteristics of tubers are concerned. A few people have reported that it is slightly earlier maturing than Netted Gem.

Further reports will be obtained and the tests continued until more definite information is secured.

GRAIN SCREENINGS.

W. Sandall, Field Inspector, located at Vancouver, reports as follows *re* grain screenings:—

"Grain screenings are a by-product originating in the recleaning process of wheat at the elevator. They are delivered from the cleaners in various separations and graded accordingly.

"The Board of Grain Commissioners of Canada, Bulletin No. 4, provides for five grades of screenings which are identified as follows: Oat screenings, No. 1 Feed screenings, No. 2 Feed screenings, Uncleaned screenings, and Refuse screenings, graded according to official standards.

"In compliance with the British Columbia 'Noxious Weeds Act' and regulations thereunder, grain screenings which contain weed-seeds in excess of the percentage allowed by the 'Canada Grain Act' of the Dominion or the regulations made thereunder from time to time for No. 2 Feed screenings shall not be removed from any grain elevator, mill, or warehouse to any place within the Province, except only by virtue of permit duly signed by the Minister or by a person authorized in writing by the Minister, and issued at the office of the District Field Inspector, Court-house, Vancouver, B.C.

" Permits above referred to consist of two specific forms—i.e., one permitting removal of low-grade screenings by a dealer or grain merchant and one a feeder's permit which entitles the holder to remove low-grade screenings conditional to prescribed regulations. These permits are restricted to certain areas, mainly within the boundaries of Greater Vancouver. Great care is exercised in preventing the removal of low-grade screenings to farming districts where the high percentage of weed-seeds carried in such screenings may become a general menace, through the introduction of many varieties of weeds.

" Up to the close of the year 1940, twenty-four permits for the removal of screenings were issued, covering various quantities, and fifteen feeders' permits were issued during the same period. All screenings permits automatically expire at the end of the year of issue.

" During the year 1940, approximately 3,124 tons of uncleaned and refuse screenings covered by permits for the removal of screenings and 792 tons of No. 1 and No. 2 Feed screenings were removed from B.C. grain elevators for local consumption. In the same period approximately 35 tons of the low grades were distributed to holders of feeders' permits.

" Complying with section 4 of the regulations under the ' Noxious Weeds Act,' managers' reports (the forms for which are supplied by the Provincial Government) are submitted each month by all B.C. grain elevators and dealers who handle screenings to the Hon. Minister of Agriculture, through the office of the District Field Inspector, Court-house, Vancouver, B.C. These reports show the movement of all grades of screenings, the name and address to whom they are delivered, date of delivery, quantity, grade, number of permit (if any), and whether for local use or export.

" According to the regulations under the Provincial ' Noxious Weeds Act,' a permit is not required for the removal of No. 1 and No. 2 Feed screenings. The tolerance of weed-seeds as allowed by the Board of Grain Commissioners for Canada, ' Inspection of Grain,' Bull. No. 4, is as follows: No. 1 Feed screenings shall contain not more than 3 per cent. small weed-seeds, not more than 5 per cent. ball-mustard, not more than 6 per cent. small weed-seeds and ball-mustard combined; No. 2 Feed screenings shall contain not more than 3 per cent. small weed-seeds, not more than 10 per cent. ball-mustard, not more than 10 per cent. small weed-seeds and ball-mustard combined. The officially authorized weed content in either of these two high grades of screenings would be enough, if carelessly handled, to start up a growth of weeds which, if not controlled, might ultimately spread throughout a district. Having in view the possibilities as herein mentioned, the writer has carried out investigations with those dealers who purchase whole screenings of the grades in question to ascertain if such screenings were manufactured in any way before retailing to the consumer. In every instance it has been found that this class of screenings is being ground and manufactured by the dealer before resale takes place, thereby removing the danger of weed-seed germination. The manufactured product is subject to analysis by the Dominion Plant Products Division for weed-seed content, also protein, fat, and fibre requirements.

" Section 11 of the Screenings Regulations requires that screenings which contain weed-seeds in excess of the percentage allowed by the ' Canada Grain Act ' or regulations thereunder for No. 2 Feed screenings shall not be ground or otherwise manufactured for sale within the Province. To comply with the above section, feed merchants who obtain low-grade screenings from elevators reclean such screenings in order to raise them to the required grade before grinding; the refuse accumulated from this recleaning process is usually exported to the United States or otherwise disposed of to ensure prevention of a weed outbreak from that source. Approximately 736 tons of this refuse have been exported by local feed-dealers during the year ended 1940.

" During the year, the movement of wheat from British Columbia grain elevators has been very light, consequently only a limited quantity of screenings has been available and the supply has by no means been equal to the demand. Appendix No. 5 will show the quantity of screenings of each grade removed from British Columbia grain elevators each month during the year 1940 as compiled from the manager's reports."

SOIL TESTING.

Soil testing by means of the Spurway method continues to be an important service rendered by this office. The tests are undertaken by S. S. Phillips, Assistant Field Crops Commissioner, and the fertilizer recommendations, together with practical soil-improvement methods, are made by P. C. Black. During the year 178 tests were made.

THRESHERMEN'S REPORTS.

In compliance with the requirements of the "Noxious Weeds Act," threshermen report annually the amount of grain and seed threshed by them. Appendix No. 4 contains a complete statement of the amount of grain, grass, and legume seed threshed during 1939 in the various districts of the Province. The 1940 statement is not given as it will be several weeks before it is completed.

NEW PLANTS.

Melana Sweet Clover.—Tests were continued with this plant under the supervision of H. H. Evans, District Field Inspector at Vernon. Time will tell whether this plant has a place either as a cover-crop in orchards or as a fodder plant. Mr. Evans in his report states that this annual clover shows great promise as a cover-crop for soil-improvement, also with its fine growth-habit, as a rapid growing and heavy yielding fodder-crop where other hay-crops are insufficient.

Strawberry Clover (Trifolium fragiferum).—A small amount of seed of this clover was introduced from Oregon. It is a perennial pasture plant adapted to wet or saline soils. Tests are being carried on in the Interior as it is felt it may have a place in that area.

REPORT OF LIVE STOCK BRANCH.

WALLACE R. GUNN, V.S., B.S.A., B.V.Sc., COMMISSIONER.

Live-stock marketings continued on the up-grade with beef and lamb prices reaching a more satisfactory level than in recent years. Swine prices of course were decided by the prices set as a result of the Canadian agreement with Great Britain. In spite of these somewhat higher prices it is questionable whether the increases were in proportion to increases in cost of production and increases in the prices of the commodities of other industries.

It might be well for stockmen to bear in mind the position in which Great Britain finds itself, as the answer to the levels and prices that obtain at the present time or may obtain for some considerable time. Canada is an exporter of beef, pork, and dairy products; and, of course, fruit and certain horticultural products. Briefly, it is impossible for Canada to compete on the British market against Argentine and certain other countries with her beef. Canada can, however, compete on this market with pork and pork products and with certain dairy products. Canada does not export lamb and could not compete on the British market against Australia and New Zealand. In the case of British Columbia, we import all these products at certain seasons of the year at least, and generally the policy of this Branch is built around the idea of developing our production to the place where it may take care of our own needs. The great difficulty with this programme is the possibility of dumping by other parts of the Dominion when great surplus occurs.

Dairy-cattle markets are always good with the United States, and when world conditions are normal British Columbia enjoys a very good market in the Orient. It is the general policy of this Department to endeavour to so build our dairy industry that when hostilities cease our cattlemen may be in a position to get a share of extending markets in the Orient, and possibly even in devastated countries—such as the Channel Islands, Great Britain, and European countries. For this market the international situation must end satisfactorily to us and there must be sufficient funds in these countries to make purchases. It might be well to consider the position that Great Britain is in at the present time with respect to imports of live-stock products. Certain live-stock products take preference. Possibly heading the list might be dairy products such as cheese. Next in order might be pork products, speaking strictly from the standpoint of Canada. The prices of both these products have been set by an agreement, and, as pointed out above, while not as high as producers had hoped, it nevertheless furnishes what is hoped to be a dependable market.

Cattle marketings in the Province were well up to normal, as is always the case when market prices are satisfactory. The annual Fat Stock and Bull Sales at Kamloops and Williams Lake were very satisfactory again this year. There is a very definite need for an extension of the feeder-sale idea in order to take care of the needs of small farmers and ranchers who are in a position to finish a few cattle. The future of British Columbia agricul-

ture demands the extension of cattle feeding. If the fruit-farmer is going to keep up the fertility of his soil and the health of his orchards he must have barnyard manure, and that can be best secured by the feeding of a few head of cattle on as many of these farms as possible. The cattle clean up certain waste products of small portions of the farm where strictly horticultural crops are not being raised and furnish the only permanent source of supply of this type of fertilizer. No farmer or rancher can afford to sell this product off his farm to supply the needs of others.

HORSES.

This branch of the live-stock industry has received somewhat of a setback due to war conditions. Lack of experienced and sufficient farm help is compelling farmers to turn to mechanical power on the farm and as a result the demand for horses has not been quite as good, although recent horse sales have proved quite satisfactory. A recent pure-bred horse sale found prices above the average and again, attempting a prediction, one might expect that following the end of hostilities horse-power will again take a lead as being somewhat more economical, especially with prices of agricultural products low and experienced help more easily obtained.

The demand for stallions has not been quite as good, which is regrettable with so many grade stallions throughout the country that could be replaced by choicely bred young pure-bred horses. Stallions enrolled to stand for public service in the Province are:—

Breed.	Classification.				Rejected.
	A.	B.	C.	D.	
Clydesdale	12	5	3	----	5
Percheron	6	6	1	----	3
Belgian	3	3	1	----	----
Grade	----	----	----	15	----

Light-horse breeding is in a reasonably healthy state, although the riding clubs are not as active as formerly, with so many men in uniform.

BEEF CATTLE.

The beef-cattle industry, as stated previously, has had a very good year, with prices above the average of the last several years. Our beef-cattle export market still continues to the United States under a quota system and British Columbia continues to import well over half the beef consumed within the Province. The following are prices for good steers on the Calgary and Vancouver markets:—

Calgary for the month of January saw good steers selling for $6.50 and in the week of January 25th they sold for $6 in Vancouver. The Calgary prices dropped on February 8th to $6.25 and continued thus throughout the month, and Vancouver remained at $6. The first week of March saw the Calgary price up to $6.50, where it remained until the week of April 25th, when it came up to $7 until the middle of May. The Vancouver market made no change until April 18th, when good steers sold for $6.25 and quotations stood at that price throughout the year. There were without doubt some minor price changes which were not quoted. In the week of June 13th the Calgary market came up to $7.75, dropping again on July 11th to $6.75; in the week of August 1st up to $7, where it remained until the week of December 12th, when prices came up to $7.25.

These price quotations between Vancouver and Calgary would seem to be out of line since ordinarily the Vancouver prices should be somewhat higher.

Every possible assistance has been extended to the beef-cattle industry. Such assistance rotates around the different factors that affect profitable production. Continued emphasis is being placed upon the value of better sires. Advice and encouragement is constantly being given to " pure-bred breeders " aiming to get these herds up to a high standard of efficiency where the type and breeding is of the quality that best suits the needs of the commercial cattlemen. In some breeds where there has been a scarcity of sires to take care of the needs in the Province encouragement has been given to the establishment of new herds. In the case

of the Hereford breed, a very good herd is being established in the East Kootenays at Newgate. Another herd is being established in the Boundary country to take care of the needs of that district. Definite improvement is being made in herds at Oliver, which very shortly will be in a position to take care of the needs of ranchers in that immediate territory. Hanceville is fast establishing a choice herd of high-class pure-bred Herefords, and our older established breeders at Westwold and Vernon still continue to supply outstanding sires to our ranchers.

The improvement in the Shorthorn breeding in the Province has been outstanding. Shorthorn breeders deserve every credit for the improvement they have made in their cattle within the last few years. In order to take care of the demands of the present-day beef market Shorthorn men are producing a compact, fast-maturing type of herd sire.

Within a few years sufficient high-class herds of the two popular beef breeds will be widely established throughout the Province so as to make it absolutely unnecessary for any commercial cattlemen to use inferior scrub sires. Every effort is being made to prevent the establishment of an undue number of pure-bred herds, however, which can only result in too many bulls being bred to take care of the needs of the country, with the result that the quality in general must go down.

Under the heading of " Nutrition and Animal Health " more will be said with respect to the other factors which affect particularly the range beef cattle industry.

DAIRY CATTLE.

The dairy-cattle industry also benefited as a result of the demands for dairy products in Britain. The need in Britain for such products as cheese and condensed milk has very definitely helped. The question of marketing in the Fraser Valley, however, still continues to be a problem; one that will not be settled until producers agree or are compelled by conditions to work together. As the population of our larger cities increases, more and more dairy products will be required, which may eventually help solve this problem.

The market for dairy cattle in the United States continues to be quite satisfactory; whether or not it is well for our industry at the present time to be selling choice cattle in large numbers is a question.

At the present time one of the most important matters affecting this industry is the question of a programme for the control of breeding-diseases in cattle. This matter will be dealt with under another section, giving special consideration to the place of calfhood vaccination.

SHEEP.

Generally speaking, sheep prices have been quite satisfactory. Lamb prices opened on January 1st at $8.50 in Calgary and remained at that until the week of March 21st when they rose to $9, rising to $9.50 again in the week of April 11th and dropping in the week of June 6th to $9, coming up the week of June 13th to $9.75 and remaining at that until the week of June 27th when price quotations were $9, dropping to $8.50 in the week of July 4th and, in the week of July 11th, $8.25. The week of July 18th prices came up to $8.75 and down in the week of August 1st to $8.50; the week of August 22nd, $8; August 29th, $7.50; September 5th, $7.25; September 19th, $7.50; October 3rd, $8; with a drop to $7.50 in the week of October 10th. October 17th saw prices back up to $8.25, continuing at that level until the week of November 7th, when prices went to $8.50 and continued at this price until the week of September 12th when they reached $8.75.

The Vancouver lamb market showed proportionately higher throughout the year than the Calgary market. The year opened with lambs selling at $9.50, dropping to $9.25 in the week of March 7th. Week of March 28th up to $10 and the week of April 18th to $10.75, dropping in the week of May 9th to $10.50, May 30th reaching $11. The week of June 20th they dropped to $10.50 and July 25th $9.65 was paid for lambs. August 15th quotations showed $9.25, August 29th $8.75, with another drop to $8.50 in the week of September 12th. October 10th prices showed $10, continuing at this level until November 14th when lambs sold at $9.25.

To come back to the ever-present question of the problem of predatory animals and sheep-killing by dogs, it is gratifying to feel that some advancement has been made in the matter of the control of dogs. An attempt was made this year by special regulation to provide some added protection to sheepmen against this loss. On the south end of Vancouver

Island a special constable was named for a short period to make a detailed house-to-house survey of the district and see that all dogs were licensed or destroyed. The work of this special officer resulted in the destruction of endless number of worthless dogs which, after all, are the ones responsible for a major part of the killings. Where there was reason to believe that any dog may have been caught in trouble an effort was made by the officer to get this animal destroyed. If this work can be continued it will very definitely improve the situation. If this plan proves helpful it should be extended to other parts of the Province. This, in the opinion of the your Commissioner, is the only way to build up the sheep industry in small flocks throughout the Province. Many sections are admirably suited for the development of small flocks, but the dog menace made it impossible for farmers to carry on.

Predatory animals continue to be a problem, with the timber-wolf appearing as a new menace in some sections of the Province. An effort is being made to encourage small flock-owners to band together under a herder, and where this is not possible to give consideration to obtaining grass pastures rather than the open range. Not only would better lambs be produced but fewer losses would be sustained. It is hoped that we will be in a position to make a preliminary report next year. A summary of the past three years' compensation claims paid is as follows:—

Year.	Sheep.	Compensation.	Poultry.	Compensation.	Goats.	Compensation.
1938	227	$1,613.25	358	$299.65	3	$19.00
1939	361	2,480.00	212	176.85	6	37.00
1940	191	1,659.25	531	396.14	2	17.00

Total compensation paid in the year 1938 was $1,931.90; 1939, $2,693.85; 1940, $2,073.39.

SWINE.

The swine industry came in for a greater interest than at any period for many years, due to the extensive advertising campaign carried on by the Federal Department of Agriculture, particularly calling attention to the Brood Sow Policy. This policy was intended to encourage the placing of quality brood sows on farms throughout the country. At that time the Federal Department undertook to make the selection, attend to details of transportation, and pay half the freight; sows to be purchased at regular market prices. Due to the keen demand for sows on the part of the farmers of the Province the British Columbia Department of Agriculture undertook to pay the other half of the transportation and assist by holding meetings where such were requested outlining the policy in detail. As a result the following sows were placed throughout the Province:—

Area.	No. of Groups.	No. of Farmers.	No. of Gilts.
B.C. Peace Block	18	149	398
North Central	2	30	35
Cariboo	3	44	74
Interior	10	115	215
Fraser Valley	6	75	133
Vancouver Island	2	23	36
Totals	41	436	891

Number of gilts placed in groups, 891; number of gilts placed as singles, 75; total number of gilts placed in British Columbia, 966.

It would be difficult at this time to say just what the permanent effect of this policy is going to be on the industry of this Province, since so much depends upon prices of pork in proportion to the cost of feed. British Columbia farmers, unlike the farmers on the Prairie, have to purchase a considerable portion of the coarse grains and mill-feed fed to swine.

During the year the Canadian agreement with the British Government came up for discussion, with the result that a somewhat lower price—reputedly 50 cents lower—was finally agreed upon. At approximately the same time hog grading was changed over from a choice between live and rail grading to a strictly rail-grading basis. Hog grading was brought into

effect in the fall of 1940 through enabling legislation in this Province. The Canadian-British agreement and the compulsory rail grading came in for severe criticism all across the Dominion, with the result that in many parts of the Dominion the sow population was definitely reduced; and, while it might not be wise to forecast, the best information available would seem to indicate that by the autumn of 1941 there should be fewer hogs available for the Canadian market.

To return to the Federal-Provincial Brood Sow Policy in this Province, the best information that we have at the present time would indicate that it has proved reasonably successful. Two things contributed to the marketing of quite a number of these sows on the part of the farmers. First was that not every sow placed could be expected to prove satisfactory and, of course, these animals had to go to market. The other factor that contributed to the reduction in sow population in the Province was a somewhat lower price for pork. When this programme was given publicity the tendency was on the part of many farmers to buy more sows than they were properly equipped to handle, and in many instances farmers undertook to put sows on farms that were not suitable for raising pigs. In fairness to many farmers throughout the Province it should be said that they felt that it was their duty to the Empire to attempt to produce what it was thought Great Britain might need.

One most encouraging result has been secured from this policy, and that is that to-day we very definitely have hogs being produced throughout many parts of this Province where hogs were never before produced in sufficient quantities to be shipped to our central markets. This has been our aim for years. It has been felt that in many parts of the Interior of this Province, especially in Northern British Columbia, the Okanagan, Cariboo, and the Greater Kamloops Districts, hogs should be reaching the markets quite regularly. From all these districts this year shipments have been coming either as co-operative or mixed car-load shipments or by truck loads, and everything seems to indicate that unless prices go very much lower we may expect these districts to remain steadily in the swine business.

Your Commissioner held many meetings throughout the Province on the question of swine production as well as demonstrations dealing more particularly with the problem of disease and nutrition. In an attempt to give the maximum of service to the swine producers of this Province your Commissioner has laid out a policy which should give a good deal of assistance to swinemen in difficulty. Bi-weekly throughout the year complete information will be secured from the office of the Federal Grader in Vancouver, showing the exact grade of each individual farmer's shipment of hogs to the Vancouver market. Armed with this information a definite attempt will be made, with the assistance of the district officers who are working closely in co-operation with this Branch, to remedy the situation in each individual swineman's herd. This may mean a change of breeding stock, closer attention to proper weights for hogs reaching market, closer attention to the matter of feeding and general management, as well as the problem of disease. Where district men are unable to reach these individual farmers assistance will be given as far as possible direct from this office. By this plan a rapid improvement may be expected in the quality of hogs being produced in the Province.

NUTRITION AND ANIMAL HEALTH.

In considering the problems facing the range beef cattle industry such conditions as hæmorrhagic septicæmia, coccidiosis (so-called), necrotic stomatitis, blackleg, pinkeye (keratitis), tuberculosis, and such conditions as knock-heel, plant poisonings, and deficiencies in general, still continue to take a very definite toll. It is well to bear in mind that in some of these sub-acute and chronic conditions, especially those of a deficiency nature, it is difficult to estimate the enormous loss sustained by the industry. While the animal may not suffer visibly to a very great extent, there may be a definite reduction in quality, weight, time of finishing, and, in the case of the breeding herd, distinct reduction in calf-crops. This year has seen the most severe and acute outbreak of hæmorrhagic septicæmia not only in this Province but all over the Dominion. Feeder-cattle being shipped even comparatively short distances developed this disease and died in quite large numbers. Cattle reaching the Prairies from this Province and those being shipped to Eastern points seem to have suffered the most.

When this disease first made its appearance in the early autumn publicity was broadcast to all points advising prevention, with the result that our cattlemen had comparatively few

losses as compared to some other parts of this Dominion. A method of treatment as a supplement to the regular vaccination has been developed which, although only used to a limited extent, has seemed to give very good results. This information is included in circulars and made available to ranchers and cattlemen where veterinary service is not obtainable.

Circulars dealing with almost all these conditions and special treatments have been developed in some instances, which are now becoming standard treatments not only within the Province but in many sections outside.

In the case of range deficiencies and the effects of poisonous plants on range cattle, your Commissioner is steadily working and is gradually building up a service in the way of trials which it is hoped will help to reduce the losses from this source. The work started many years ago on mineral deficiencies, the first probably to be done in the range country of Western Canada, has definitely resulted in an outstanding improvement in the situation on our cattle ranges. These suggestions are now becoming standard practice by almost every cattleman in the country, and your Commissioner is fully convinced that this alone has improved the percentage calf-crop very greatly, resulting in hundreds of thousands of dollars coming to our range cattlemen. The same may be said with respect to the sheep industry. Tests are being made from time to time for the addition of different elements in these mineral mixtures in an attempt to still further improve the situation. It is interesting to note that your Commissioner's opinion that a deficiency of phosphorus is primarily the dominant factor has proven to be correct as a result of definite checks.

In all this range work we have received the very best of assistance from the Federal Department of Agriculture officers. Especial mention should be made of the help secured from Dr. E. A. Bruce, Pathologist, Dominion Department of Agriculture, Saanichton.

Knock-heel, due to cattle eating the legume *Astragalus campestris*, is one of the greatest problems contributing to this complexity of situations with range cattle. The help received from Dr. Bruce in trying to control this situation is particularly valuable, since to him is due the credit for proving *Astragalus campestris* to be responsible for the condition known as knock-heel. In order to further check on possible factors playing a part in these range-cattle problems a check is being made on the different lakes and sources of water-supply for cattle in sections of the Province and it is hoped that further work can be undertaken this year.

Our eradication-work with tuberculosis on the range is continuing again with the idea of gradually eliminating the disease from our range herds.

Encephalomyelitis work continued again on the same plan as previous years, although it might be well to state that horsemen in general did not vaccinate as completely as during the year 1939, with the result that the disease made its appearance in a few individual cases in several sections of the Province. It is quite evident that the only thing that will bring about complete protective block vaccination will be a severe outbreak, which, unfortunately, will without a doubt establish the disease permanently in the Province and permit the virus to locate in such reservoirs as ticks and other usual carriers. In one section of the Province where the first fatal case occurred in 1938 no cases occurred in 1939 due to complete vaccination in this particular valley. A fatal case occurred in 1940 within a very short distance of where the original case appeared, simply because the horsemen did not see fit to continue the programme.

In this particular district several treatments for human cases were shipped into the district during the summer of 1940, which would seem to indicate a possibility of some cases in human beings being suspected. It is the opinion of your Commissioner that horsemen should really give serious consideration to this policy since we in British Columbia are particularly well supplied with reservoirs for carrying the disease over from year to year if the disease ever makes its appearance as an epizootic. Allowing this disease to become widely spread, establishing itself permanently in such carriers as ticks, would seem to be very shortsighted, particularly when through the prompt action of this Department the disease has been held in almost complete check.

What the programme for the year 1941 may be is hard to predict, with horsemen not fully appreciative of the situation. The source of supply of vaccine may also be a problem with one biological house having secured the patent rights for the manufacture of the vaccine. A new vaccine has been developed using a 1 cc. dose in place of the usual 10 cc. and being

administered intradermally instead of subcutaneously as previously. This type of vaccine is credited with giving a stronger immunity with less local reaction, in fact no local reaction at all, it is believed.

In the field of swine diseases every effort has been put forth to get to the bottom of these complex swine diseases and there is available now in the Department a circular dealing fully with this situation. It would seem that these diseases result as a combination of faulty nutrition fundamentally, which permits different types of infections to gain access to the animal system, resulting in a complex disease condition. A programme of management and treatment which appears to be giving the best results to date has been worked out, and if religiously carried out the swinemen should be able to remain practically free from this trouble.

A condition affecting horses throughout many sections of the Province was brought to our attention during the year. This trouble included a very severe type of parasite infestation and seemed to affect not only the digestive tract of the animals but some of the parasitic invaders apparently gained entrance to the blood vascular system, giving rapidly fatal results, no doubt, by the blocking-off of important blood-vessels in the form of a thrombus. The treatment we developed might be considered from two angles, one portion of the treatment dealing strictly with the condition of the blood system, aiming to destroy the parasite during the stage within this system and at the same time dealing with the anæmic condition that accompanies severe parasitism, and an entirely new and original form of treatment dealing with the parasite in the digestive tract. The results have been so outstandingly good that all those who have tried it are particularly enthusiastic. This treatment is being passed on to interested veterinarians throughout the Province and where veterinarians are not available advice is being furnished to the horsemen direct.

From the standpoint of breeding-diseases in cattle great impetus is being given to the control of Bang's disease as a result of the official recognition given to calf vaccination by "Strain 19" vaccine by the U.S. Bureau of Animal Industry. Your Commissioner has for years felt this treatment to be the only possible practical answer to the disease, Brucellosis, and is firmly of the opinion that if properly controlled this vaccine will certainly do a very great deal for the industry. The vaccine to date cannot be manufactured or imported into the Dominion, but it is expected that during the coming year some form of limited use may be expected.

The Dominion Department of Agriculture is anxious to not hamper the industry in any way but is fully of the opinion that the vaccine must be carefully handled. The future of the cattle industry requires that an effort be made to reduce the number of positive cattle in the country, and therefore the vaccine should not be administered to older cattle but rather be confined to use on calves prior to eight months of age, and better under six months, before they reach sexual maturity. It is the general feeling of those qualified to express an opinion that the vaccine should not be used where there is a very low incidence of the disease in the herd. The great danger in the opinion of your Commissioner is that stockmen are liable to expect too much from the use of this vaccine. The vaccine very definitely cannot be expected to give results in herds where the owners insist on carrying on careless practices in general. Good management and nutrition are fundamental to the success of a vaccination programme. Cattle-owners must also be breeders of cattle and not peddlers. The practice of adding cattle of unknown origin oftentimes carrying a heavy infection of strains of the disease entirely new to the herd is certain to very definitely modify the results that may be expected. Only by going slowly and carefully keeping close check on the effects of all practices will it be possible to secure the maximum of results.

Another very interesting piece of work undertaken during the year has been the use of Rex Wheat Germ Oil in a large dairy herd. The herd consists of some 125 head of cattle and approximately 40 head were used in the test. All problem cattle such as shy breeders were included in the test. The results definitely showed a distinct improvement in the efficiency of the cattle under test. Calves came stronger and were freer from the usual calfhood troubles. The cattle on test showed decided reduction in the amount of placenta trouble. Fewer services were required for each animal. The activity of the sires as well as the cows on test was definitely better. In general the use of this product in dairy herds would appear to have very definite worth.

WARBLE-FLY AND TICK-CONTROL WORK.

It is safe to say that no programme undertaken by this Branch has met with a better response by the stockmen of this Province than our warble-fly programme. From a small beginning in the Deep Creek area of the North Okanagan in the year 1933 the work was extended into the Fraser Valley, at first rather slowly, until to-day in this latter district some 1,820 herds were treated, totalling 24,571 cattle, with an estimated number of 54,667 warbles on the backs of animals at the time that they were being given treatment. The year 1941 will see a definite extension in this district, with the possibility of the entire valley being included in an area by the year 1942.

An interesting side of the warble-fly control programme is the interest that is now being taken by ranchers even on some of the larger ranches. For some few years we have been extending a small original area north of the town of Kamloops, until to-day it includes a large part of that district and will very shortly take in all the stockmen in the North Thompson district. The excellent support given by J. D. Palmer in the beginning of this programme is largely responsible for its present advanced position. From almost every section of the Province come inquiries regarding warble-fly control and by 1942 it is expected that quite a large number of the bigger ranchers will be undertaking this programme. Your Commissioner, with the very excellent assistance of the district men, has been able to awaken the people throughout the ranching sections of the country to the advantages of such a programme. It has been estimated that the loss per animal to the ranchers in areas where warble-flies are prevalent means somewhere in the neighbourhood of $5 per head. Ranchers who have taken our suggestion in availing themselves of this programme begin to see its worth. Not only do the cattle do better but stock are readily handled during the daytime, which is an impossibility where there are heel-flies, and cows stay out on the open range and as a result are more readily within the reach of herd sires. Another important point is that during the spring months when cattle are in the feed-lots, and worth the most money, warbly animals have to receive a heavy cut on account of the trimming that is necessary on beef carcasses. Taking a long-distance view of the situation our cattlemen too are now aware of the possibility of having their live cattle shut out of foreign markets if not free from warbles.

As this work progresses, and we near the end of our heavy drive, attention will have to be given to dealing with the late warble, which may possibly be due to another species of fly. Check is being made this year to ascertain whether this is the case and if it is found to be so a plan will be outlined to make a final clean-up of this later species.

Regarding test-work being done on the wood-tick (*Dermacentor Andersonii*) and the winter tick (*Dermacentor albipictus*), the use of a standardized Derris was attempted several years ago in an effort to assist ranchers who were sustaining heavy losses from the *Dermacentor Andersonii* and where it was found impossible in some instances to use otherwise very good ranges during the spring months. Your Commissioner makes no claim to this method of control being 100 per cent. effective, but it very definitely has been to date, as far as we know, the most practical method of trying to deal with this situation. In order to secure the best results all other supplementary efforts must be given consideration. The control of rodents is a very necessary thing. While your Commissioner feels justly pleased with the results secured by this method of control, which was first suggested by this office, there is no thought of conflicting in any way with other programmes that are being tried out and which of necessity must be tried out by those research-men who are dealing with that particular type of work. We, as the extension department of the Province, feel that we must apply the best practices possible in trying to deal with the situation. It was only by chance that this idea occurred to us in the first place.

We have considerable correspondence dealing with the different little trials that are being put on from year to year, and every single one of these reports is encouraging—some very much so. The results reported by some workers, which would seem to be in conflict with our experiences, have been due largely to the fact that these men were unfortunate in not making a more thorough study of the different brands of Derris available. Your Commissioner went through all these experiences in trying different brands and has found many of these very uncertain in the results they give. With the brand that is now being used the results are decidedly more uniform and satisfactory. Until some better method of control is brought forward this is by far the most useful and will be continued until our research-men can present something better.

GENERAL.

During the year 1940 the work of the Live Stock Branch has extended considerably. Every effort is being made to serve all branches of the live-stock industry as fully as possible.

I wish to thank all the district officers who have been so very helpful in the carrying out of the different programmes undertaken by this Branch. The efficiency of the work of this Branch depends very greatly upon the efficiency of the field services.

The close co-operation between the different branches, particularly the Field Crops Branch, has been of very great assistance.

REPORT OF DAIRY BRANCH.

HENRY RIVE, B.S.A., DAIRY COMMISSIONER.

As to production, the season of 1940 has, on the whole, been fairly favourable to the dairy industry. Early drought was general, curtailing pastures, but at the Coast fall-sown dairy crops did well. Later rains assisted as autumn advanced and the mild weather which prevailed encouraged a good fall production of milk. A fair annual increase (probably 12 per cent.) in total output of milk will be recorded.

Prices received by the dairy-farmer were low during most of the year. After a slight increase during the early months, they again receded until late in the fall. This season marks a ten-year period, with few lapses, of uniformly low prices to the dairy producer in Canada. Prices of all dairy feeds and particularly of concentrates have gone up appreciably.

DAIRY FACTORIES.

Twenty-seven butter-factories, four cheese-factories, two condenseries, one milk-powder plant, and two casein plants have operated during the year. Several plants specialize in wholesale ice-cream manufacture. Many small plants manufacture and retail, and some butter-factories wholesale, ice-cream. A new creamery was established at Creston.

Regular calls have been made on all dairy-factories and milk plants by officials of this Branch. Equipment, storage, sanitation, and methods of manufacture have been periodically surveyed and discussed as occasion demanded. The grading and testing of milk and cream supplies as to practice and equipment have been consistently scrutinized and many check-tests have been carried out and results communicated promptly to producers.

CREAMERIES.

The creamery butter output for the season will be approximately the same as for several years, about 6,000,000 lb. The annual increase in output of butter that the total production of milk in British Columbia would indicate as likely is lacking through the diversion of supplies into other channels. The newest creamery districts are those of Creston in the East Kootenay and Telkwa in the North Bulkley Valley. During the year some sixteen of the larger creameries of the Province have taken advantage (a number quite regularly) of the grading service afforded by the Dominion Dairy Branch through its officials in Vancouver. Of the butters scored, 89 per cent. graded First and about 10 per cent. graded Second. The butter from these creameries represents that portion Provincially manufactured reaching the larger wholesale channels. The remainder as a rule finds an immediate local market. With little divergence, the butter manufactured to-day is of the mild pasteurized cream type with good keeping quality.

CHEESE.

Prospects for the cheese-manufacturer have been brighter, but production in this Province has declined slightly due to more remunerative channels for milk. It is to be regretted that during the year no new enterprise has seized the moment favourable for commencement when butter prices presented no obstruction and the grade premiums per pound cheese from the Dominion Government were still available. Consumption of cheese has greatly increased in British Columbia during the past eighteen months owing to the military camps maintained, but three-fifths of cheese consumed has come from without.

CONDENSED PRODUCTS.

A substantial increase has taken place in the output of evaporated milk during the past season. Many thousand cases more than in any previous year have been produced and a rise of over 20 per cent. in output is anticipated. Very little whole-milk powder was made. The output of skim-milk powder remained about the same as last year with slightly more casein. The demand for evaporated milk for export has been good, influencing all parts of the country, but exports are naturally principally furnished by Eastern Canada.

ICE-CREAM.

The year has been a good one for the ice-cream trade, showing a remarkable uplift in sales. It is to be regretted that a larger share of returns obtained for the finished product cannot reach the dairy producer, but the butter-fat which he supplies represents one only of many items in the cost of manufacture and marketing.

HERD IMPROVEMENT.

Thirteen cow-testing associations employing seventeen supervisors have been in operation during the year. One association has been merged in another since last reported on, to avoid duplication of effort and transportation expenses in neighbouring areas. Three hundred and eighty-five herds with 7,700 cows have been on test. The existing project is on a sound basis; the members are convinced adherents of regular and continuous record-making. The scheme in British Columbia, nevertheless, stands in need of greater publicity and of more influential endorsement and approval than it can at present command. There can be instanced no other plan of agricultural work, both educational and practical, contributing so largely towards enlargement of ideas and to immediate monetary benefits. As a sound, sensible basis for improved and intelligent breeding of dairy stock, records of production stand paramount. As a means of reducing costs of production and thereby assisting successful marketing, ascertaining totals of production should be practised generally in all dairy districts, and no effort should be spared to make all breeders of dairy cattle conform and participate. At present, too little attention is given to the havoc wrought by pure-bred, registered dairy cattle of unworthy parentage lacking in the attributes that accompany plentiful and economic production. The fact that security of lineage and registration are guaranteed is taken to mean that excellence in all dairy qualities must also perforce abound, which is a most harmful and damaging fallacy. Individual opinions of conformation requirements for production are also sufficiently at variance to give little help in breeding to this end. Production of milk and butter-fat is the prime function of the dairy cow, and greater effort should be made to secure it in the fullest possible degree from animals by inheritance of constant, high-productive quality.

Since the institution in 1913 of the Provincial Cow-testing system under this Department, progress has been maintained in spite of difficulties. The earliest annual records of completed lactation periods of associations commencing operations under the system during the first ten years averaged 268 lb. of butter-fat; those of the next ten years 307 lb. The first average of all completed lactations secured during 1914 was 278 lb. That for 1939, from records of several thousand cows, was 363 lb., notwithstanding that in 1926 the period of days considered in a lactation was reduced from 365 to 305 days, as conforming more closely to the dairy-farm practice of this country.

ANNUAL AVERAGES OF ALL LACTATION PERIODS FROM THE VARIOUS COW-TESTING ASSOCIATIONS SINCE THE YEAR 1914.

Year.	Days.	Milk.	Average Fat.	Fat.
		Lb.	Per Cent.	Lb.
1914	365	6,706	4.14	278.0
1915	365	6,517	4.07	265.2
1916	365	6,465	4.06	262.4
1917	365	6,629	4.24	280.2
1918	365	6,784	4.24	287.8
1919	365	6,636	4.22	280.9

ANNUAL AVERAGES OF ALL LACTATION PERIODS FROM THE VARIOUS COW-TESTING ASSOCIATIONS SINCE THE YEAR 1914—*Continued.*

Year.	Days.	Milk.	Average Fat.	Fat.
		Lb.	Per Cent.	Lb.
1920	365	7,059	4.29	303.0
1921	365	6,862	4.47	307.1
1922	365	7,073	4.47	316.0
1923	365	7,132	4.25	303.0
1924	365	7,537	4.13	311.7
1925	365	7,912	4.04	319.5
1926	305	7,825	4.05	317.1
1927	305	8,044	4.11	330.7
1928	305	7,937	4.17	331.2
1929	305	7,928	4.17	330.9
1930	305	8,015	4.20	336.6
1931	305	8,356	4.18	350.0
1932	305	8,394	4.20	353.0
1933	305	8,000	4.25	340.0
1934	305	7,945	4.23	336.0
1935	305	7,901	4.28	338.0
1936	305	7,857	4.30	338.0
1937	305	7,872	4.34	342.0
1938	305	8,081	4.37	353.0
1939	305	8,292	4.37	363.0

It is reasonable, therefore, to claim for this work that it is responsible for securing several million pounds of butter-fat in regular annual increase. This has been effected largely by indicating low producers and causing their slaughter and elimination as breeding stock. More difficult is the task of bringing subsequent increase by breeding operations in view of the huge proportion of pure-bred bulls of low-producing capabilities that everywhere prevail. The lists of sires, nine of which have been published, are designed to implement the information gained by the record-keeping herd-owner with data regarding performance of daughters and their dams and so evaluate the sire. Unfortunately, of several hundreds of dairy sires dealt with in recent lists, only 21 per cent. left daughters whose average production was better than that of their dams. Thirty-one per cent. held their daughters at about the same level of production as their dams possessed and 48 per cent. lowered their daughters' production below that of their dams. Protection of the ordinary dairy-farmer in his operations against these worthless, destructive pure-bred dairy sires is most urgently required in the interests also of economic production.

While there still are in this Province but relatively few dairy cattle, regulatory measures are of the greatest importance. The opportunity now afforded of building for the future excellence of dairy herds deserves immediate action. The elimination of the worthless and the survival of the fittest of dairy stock as breeding animals should not be left entirely to chance.

CREAM GRADERS' LICENCE EXAMINATION COURSE.

No course was held during 1940 owing to a scarcity of applicants for licences. It is expected that a course will be held during March next in Vancouver.

LICENCES ISSUED.

During the year eighteen applicants for testers' licences were examined. Seventy-six testers' licences were issued and forty-two combined testers' and graders' with one single grader's licence. To fifty-eight persons, firms, companies, or associations creamery or dairy licences were issued.

VERIFICATION TESTS.

No verification tests were requested during 1940.

MEETINGS.

Meetings were attended and participated in by members of this Branch at Summerland, Kelowna, Vernon, Chilliwack, Creston, Saanichton, North Saanich, Vancouver, Mount Lehman, and Nanaimo. A radio talk was delivered at Kelowna.

PUBLICATIONS.

Dairy Circulars No. 39, "Annual List of Milk and Butterfat Records"; No. 40, "Some Causes of Variation in Percentage of Fat in Milk"; No. 41, "The Ninth List of Dairy Sires"; and No. 42 (stencil), "List of Long-distance Production Records" were the publications of the year.

OFFICE-WORK.

Reports and returns respecting manufactured products and markets, together with applications and correspondence as to cream grading, testing, licences, general dairy-work, milk recording, and dairy sires continue greatly to increase in volume. The work of the two stenographer-clerks has been most satisfactory.

GENERAL.

Regular returns of manufactured dairy products are received and transmitted in co-operation with the Dominion Bureau of Statistics. Factory and dairy plant inspection with checking of grades and tests was carried out by F. C. Wasson and F. Overland, Provincial Dairy Inspectors and Instructors, while supervision of herd improvement work with dairy sire listings was in charge of G. H. Thornbery, Assistant in Charge, Cow-testing Associations —all of whom have continued to show application and devotion to their work.

REPORT OF CHIEF VETERINARY INSPECTOR.

ANSON KNIGHT, V.S., CHIEF VETERINARIAN.

During the year your staff has been particularly busy in attending to its regular work of T.B.-testing and dealing with cases under the "Contagious Diseases (Animals) Act." In addition to this, considerable time and advice was given to farmers on diseases of domestic animals. This is more particularly true of the outlying areas visited by your Inspectors where a veterinary practitioner is not available. The advice thus rendered to the farmers has been duly appreciated and of considerable assistance to them in saving a good many animals.

Feed conditions throughout the Province have been adequate and the stock are going into winter quarters in good condition. Throughout parts of the Cariboo and Central British Columbia hay was rather short but grain promised to be a fair crop. This, together with the small amount of hay they can put up, should tide their animals through the winter months. Prices of live stock of good quality have been good and the stockmen are encouraged to carry on and, if possible, increase the live-stock population. When prices are fair to good on live stock the reaction is that farmers can afford to buy better sires and thus improve the quality of their animals, which has been noticeable in the prices paid for bulls at our different live-stock sales.

Dealing more specifically with the diseases dealt with by your staff, I would submit the following:—

Encephalomyelitis.—Five cases of this disease were encountered, more especially in the southern part of the Province; one fatal case occurred at Creston and four at Kamloops, three of which died. The case at Creston gave an impetus to vaccination and it is believed that 90 per cent. or more of the horses in that area were vaccinated. Vaccination was also carried out in many cases in the vicinity of Kamloops and other farming areas throughout the Province. No cases were reported throughout Central British Columbia, the Cariboo, or the Peace River Block.

Ringworm.—An aggravated outbreak of this disease warranted an inspection at Gibsons Landing as it was thought to be mange. The disease was confined to dry cows or animals that had been turned out in the late fall and winter months and the adverse winter conditions tended to produce a condition of the skin which was rather alarming. The cattle quickly responded to the proper housing and treatment of this disease.

Hæmorrhagic Septicæmia.—Outbreaks of this disease were reported from Merritt, Seymour Arm, North Thompson, and White Lake, confined to beef herds. On instructions from your Veterinary Inspector the cattle were injected with bacterin and no further trouble occurred.

Influenza.—An outbreak of this disease occurred in the North Thompson at Longworth, in Central British Columbia. In the latter district two animals died. The rest were vaccinated against the disease, which I believe has held the trouble in check as no further cases have been reported.

Coccidiosis.—This disease takes a toll of young cattle, more especially throughout the Interior of the Province. As there is no vaccine for the treatment of this disease it is up to the farmer to take precautionary measures against infection of his herd. Certain medical remedies when adopted in the early stages of the disease have proven to be partially successful. Advice has been given to the farmers in past years to move their young stock on to new ground; to discard their old corrals and feeding-grounds and, if possible, plough up the ground and keep the cattle off such areas for a year or two. Where this has been adequately carried out the farmers report good results, but I am sorry to report that the majority of the stockmen are indifferent to the disease and will not take the trouble to adopt precautionary measures.

Foot-rot of Sheep.—This is the first year over a lengthy period that we can report this disease not found amongst sheep. Over 30,000 head of sheep were inspected before going on the range and no symptoms of the disease were discovered. By taking ordinary precautions I believe the sheepmen can keep their flocks free from any further trouble.

Internal Parasites.—Considerable advice was rendered the farmer in the control of parasites amongst sheep and pigs. In the Peace River Block a number of pig herds were found to be badly infested. Where large numbers of pigs are so badly infested it means considerable financial loss to the owner, not only in the value of the pigs themselves but in the expense of ridding the premises of these parasites, as it means moving buildings and yards on to new ground, disinfection of premises, and the medical dosing of the animals, which is rather a tedious proposition. In a number of cases the onset of this trouble was caused by outside pigs being taken into clean herds and after a few months the parasites spread to practically the entire herd of pigs.

What has been said in regard to pigs also applies very largely to sheep. Internal parasites are usually not found in range flocks but more in small flocks on confined areas, being more noticeable in flocks around Vancouver Island and the Lower Fraser Valley. Range flocks travelling over a much wider area and throughout the grazing period are practically every day on new grazing-ground and thus are not obliged to gain their feed by grazing close to the ground.

Tuberculosis.—Your veterinary staff has carried on the testing for tuberculosis during the past year over a considerable area. The work in this connection was confined largely to the testing of herds from which milk is drawn for human consumption in the cities, towns, and villages throughout the Province. Eight hundred and thirty-nine premises were visited, 7,008 cattle tested, and 19 reactors uncovered. The majority of these reactors were found in two herds, and such reactors have been killed and the carcasses buried or burnt.

On January 4th the Dominion Government commenced the testing of what is known as the Vancouver Island and Gulf Islands T.B.-restricted Area. To date some 18,255 cattle have been tested and 123 reactors uncovered by Dominion officials. There still remain a number of semi-wild cattle to be tested. These cattle are located in the wooded area around Oyster and Campbell Rivers. I believe it is the intention of the Dominion officials to endeavour to make a test of these cattle when they can be rounded up during the winter months.

The small number of reactors found under Provincial test has been quite encouraging in view of the number of premises visited and cattle tested. In many areas you will note that there were no reactors found, whereas in former years there was a heavy percentage of reactors.

Your staff also has carried on the inspection and grading of dairy premises and I am pleased to report that there is a gradual improvement in the sanitary arrangements of stables and dairies and better care in the handling of dairy products. Appended you will find a detailed list of the districts and areas visited, together with the number of premises visited and cattle tested. (*See* Appendices Nos. 6 and 7.)

REPORT OF POULTRY BRANCH.

J. R. TERRY, POULTRY COMMISSIONER.

The cycle of mild winter weather continued for another year, paralleling 1937, 1938, and 1939. Again the months of February and March were more spring-like than April and May.

The usual slaughtering of pullets and yearlings was again experienced at the beginning of the year, due to surplus egg production and poor demand. Many thousands of dollars are lost annually through breeders attempting to carry over too many layers, many of which, to make matters worse, were hatched too soon. February and March hatched pullets need special treatment to keep them laying after October. The wintry winds and cooler temperatures experienced at that period invariably causes a false moult, with resultant drop in egg production.

Prices received for eggs during the past ten years, per dozen, have averaged as follows:—

	Cents.		Cents.
1931	20	1936	21
1932	15	1937	24
1933	15	1938	25
1934	15	1939	23
1935	16	1940	22

It should be noted that prices quoted are averaged for the three principal sizes—large, medium, and pullets.

Complaints were again numerous as to the small eggs laid by many pullets early in late summer and fall. On investigation this was found due to the feeding of excessively rich rations. This, together with restricted areas for range and the excessive hot weather during last summer, forced many birds into laying before they were four and one-half months old. Eggs laid by these fowls are produced at a period when prices commence to stiffen, and as a result the small eggs are preferred at a much lower price, thus reducing the price of larger eggs.

BREEDING AND REARING RESULTS.

On the whole, hatching results were fairly satisfactory. The action of the hatcheries in paying a premium for eggs with high hatchery power is beginning to have its effect. Producers supplying hatcheries are apparently more careful in selecting, storing, and transporting eggs to hatcheries. Shippers are urged to see that in packing hatching-eggs the small end of the egg should always be at the bottom. Putting the large end at the bottom often results in rupture of the air-cell and consequent poor hatching results.

Increased shipments of hatching-eggs were sent to Prairie and Eastern Canadian points during the year. Approximately nearly half a million chicks were exported, many of the hatcheries increasing their capacity and also lengthening their incubating period. In a few instances table poultry producers, all experienced men, hatched throughout the year, the majority of fowls raised being marketed as broilers.

Cross-bred stock is being raised in increasing numbers, with the general purpose breeds predominating. Red-Wyandotte, New Hampshire-Wyandotte, New Hampshire-Rock, New Hampshire-Light Sussex—all of these crosses—the first-named breed supplying the male—are sex-linked, allowing day-old sexing to be seen by a glance at colour of plumage.

POULTRY DISEASES.

The majority of outbreaks of disease reported and investigated during the year originated in the Fraser Valley.

As usual, the diseases—vent canker, vent gleet, and diphtheretic roup—are the principal ones found amongst city-kept flocks. In most cases these birds are culls shipped to city markets and bought by urban dwellers on account of cheapness. In most markets rigid inspection is made before fowls are marketed and diseased fowls eliminated.

Members of the Branch, while visiting disease-infected flocks, again reported difficulty in getting breeders to cull and destroy diseased birds rather than attempt to cure by nostrums. In the majority of places visited a room or pen was being utilized as a "hospital." In the writer's opinion this is a sign of poor management.

The principal diseases and numbers of same investigated were as follows: Paralysis, 75; *tuberculosis*, 3; *coccidiosis*, 54; *diphtheretic roup*, 18; *cannibalism*, 8; *ovarian trouble*, 8; pullorum, 5; leukæmia, 8; crop binding, 4; premature moult, 12; worms, 13. Rabbits: Cannibalism, slobbers, and coccidiosis, 33. Turkeys: "Blackhead" and worms, 8; incubating and brooding, 21.

Several cases of soft-shelled eggs, double yolks, and blood spots in eggs were found to be caused by excessive feeding of meat protein—dried milk, beef-scrap, or fish-meal. In a complaint *re* egg taint it was found that the birds had been fed salmon roe *ad lib.*

The Branch wishes to acknowledge the co-operation of Dr. E. M. Bruce, V.S., of the Pathological Laboratory, Dominion Experimental Farm, Saanichton, who has post-mortemed many fowls delivered or advised sent to him by the Branch.

BLOOD-TESTING.

The sixth year's operation of this work started early in September, and with favourable weather prevailing almost through the season work was concluded early in the New Year. The mainland flocks again provided nearly all the birds tested. The usual staff conducted the work. A humorous note was injected into the work by a mainland breeder having capons tested.

Mr. Landon's statement *re* the work throughout the Province follows this report.

DRESSED-POULTRY TRADE.

More high-class table-poultry was produced last year in the Province than previously. This work has been helped considerably by the breeding of general purpose fowls rather than light-weight or egg-producing stock. The Dominion authorities again emphasized its grading and improving dressed poultry projects with good results.

With dressed turkeys it is to be noted that although the great majority of birds killed were of the Bronze variety the White Holland and Red Bourbon were also marketed in increased volume. Better prices were realized over last year.

With the ordinary fowls the medium-weight breeds—New Hampshires, Light Sussex, Barred Rocks, Rhode Island Reds, and White Wyandottes—again held their popularity. To a limited extent Jersey Giants, both black and white, were used. The crosses of New Hampshire males with Wyandotte, Rock, or Light Sussex hens produced cockerels of quick, vigorous growth, equally excellent for broilers or roasters. The pullets of these crosses were also found to be excellent layers, in addition to providing an excellent table carcass after the laying season.

The writer again urges full consideration of the problems to be met with in table-poultry production by beginners before embarking. Even experienced commercial breeders find the work strange after concentrating on egg production previously.

Table-poultry producers are now able to purchase day-old cockerels for at least two-thirds of the year from hatcheries. It is customary, however, for the producers to secure orders from buyers well in advance so as to make sure of a market. Where producers peddle their fowls it is imperative in most municipalities to secure a peddler's licence before starting up. Fines for non-observance of this are generally severe. Most towns fix licences at about $50 to $60 per year.

Where producers sell their fowls by live weight to Orientals or hucksters it is very doubtful whether the procedure is a profitable one. Proper killing and cooling space, as well as provision for fattening crates or pens, is also a prime necessity.

The method of feeding table-poultry, whether broilers or roasters, is different from feeding for egg production. Wet mashes is the principal form in which the ration is fed.

Quite a few capons are now produced, but unless well experienced the caponizing operation is not profitable. Many expensive sets of instruments have been purchased, only to be quickly discarded or sold at a loss. There is a limited call for capons and with a demand for medium-sized roasters of from 3½ to 4½ lb. always at hand it is advisable for the producer to concentrate on raising cockerels to fourteen or sixteen weeks. The last two weeks should be utilized in crate-fattening.

A total of forty-three Boys' and Girls' Clubs was organized this year, being a considerable drop from former years. Last year's total of eighty-two clubs was an all-time record.

The clubs were divided as follows: Chicks, 18; hatching-eggs, 25; total, 43. The Reds were again the most favoured breed, with Barred Rocks in second place, White Wyandottes third, White Leghorns fourth, and New Hampshires fifth.

As usual the clubs were formed by District Agriculturists, Farmers' and Women's Institutes, Poultry Associations, school-teachers and others. Mission City District, with a total of eleven clubs, heads the list; and Langley District, with nine, was second.

The Vancouver and Victoria Exhibitions again sponsored judging exhibitions, and these were well attended. The leading students at Vancouver Exhibition were chosen to represent the Province at the Dominion Government Trials at the Royal Fat Stock Show, Toronto, in December last.

TURKEYS.

With a fairly heavy drop in production of Prairie turkeys our breeders were able to record a higher price for fat stock than in the past decade. With better feeding rations and more attention to hygienic and sanitary matters turkey-raising has become less difficult than in the old days. Quite a large proportion of young stock is now raised in confinement on wire-netted floors for at least the first eight or ten weeks. Mammoth Bronze is still the favourite, but White Holland and Red Bourbon turkeys are also increasingly bred. Possibly half of the production now takes place at Coast and Island points. In the Interior, the Okanagan Valley has more breeders than the other sections.

WATER-FOWL.

The interest in water-fowl production continues, with geese leading the duck varieties. In ducks the egg producers, Khaki-Campbells and Indian Runners, are well in demand, and for table, the White Pekins and Coloured Muscovy are the leading choice. With geese, the Toulouse and Embden and crosses of these two are the leaders. Where there is sufficient rainfall and running streams or low-lying land geese may very profitably be kept. During the year requests were made for geese for killing purposes so that the grease could be used by druggists. It appears that considerable demand is still made for goose grease for bronchial ailments by drug-store customers.

Would-be geese-breeders should remember that unless the young stock is able to get most of the rations from grass it will be quite expensive purchasing grain feeds. It should be noted that geese hatching by hens is much less expensive than using mother geese.

RABBITS.

A directory of the Vancouver Rabbit Breeders' Association was again issued with the co-operation of the Vancouver breeders. With Old Country markets partly closed to our breeders, it is good news to record that Canadian buyers are now appearing. There seems to be a demand for Angora wool to be utilized for parts of the garments of aviators. Prices have stiffened slightly and apparently better prospects are in view. A fair amount of interest was also evinced in table rabbits, with Flemish Giants, Belgian Hares, and New Zealand Reds the more popular. The writer again urges precaution in dealing with wool-buyers at distant points.

The demand for bulletins has been maintained, with an increase over last year. Several bulletins have been revised and published during the year, together with breeders' directories of the British Columbia Poultry Association membership and of our Flock-approval Plan breeders.

Poultry shows were held at Vancouver, Kamloops, and Ladysmith, the associations at these points being affiliated with the British Columbia Poultry Association.

REPORT OF RECORDER OF BRANDS.

GEO. PILMER, RECORDER OF BRANDS.

The number of cattle shipped during 1940 was 40,022, a decrease of, roughly, 1,600 from the figure for 1939.

In the Cariboo District, although Williams Lake shows 8,566 head shipped, an increase of 300, probably as a result of the feeder-cattle sale, as a whole there is a drop of 1,500.

Kamloops, with 6,256 head, is up by about 900; and Nicola, with 6,472 shipped, is about 500 down. The Ashcroft figure of 1,858 is only about 60 per cent. of the previous year. In the Okanagan and Similkameen and South-east B.C. Districts the shipments show little change. The same applies to Central B.C.; but Burns Lake, with 1,277 head, is up about 50 per cent. Peace River District shipped 2,542 head; Dawson Creek accounting for 2,247 of these, practically double the 1939 figure.

Hides likewise showed a drop on the year—from 27,400 in 1939 to 24,698 in 1940.

The work of the various Inspectors and police officers has again been carried on very efficiently, and the ranchers seem well satisfied with the service. The Department is much indebted to the Provincial Police for their valuable work in making inspections and carrying out much investigation-work. The only drawback, and it is a serious one, is the situation on the Cariboo Highway. As mentioned in last year's report, with the small staff of police near the toll-gate it is quite impossible to make an adequate check on stock, etc., moving by truck to the Coast, and stockmen fear this is increasing the danger of illegal shipments.

The only changes in the inspection service personnel are minor ones. J. D. Moore, Government Agent, Fort Fraser, was appointed a Deputy Brand Inspector in place of Mr. LePoidevin, who moved away; and a new part-time Inspector, R. F. Clark, was appointed at Forestdale.

Special Patrols.—The Commissioner of Police again detailed Constable Boys for special work in checking up on the operation of the "Stock-brands Act" and generally looking out for the interests of the stockmen, and the latter have expressed their appreciation of this valuable assistance.

In the Clinton District for the second year a number of ranchers contributed to a fund to place a rider on the range during the summer months, and their lead was followed this year by some of the ranchers in the Lytton District. The results have amply justified the expenses, and it is suggested the Department might show its interest in this work by contributing a portion of the cost.

Slaughtering of Horses for Animal Food.—There was not as much activity as during the previous year, and the business is now under better control through strict licensing and putting in force certain requirements for the protection of the ranchers.

Convictions were obtained in the following cases:—Branding with unregistered brand: Two, at Canal Flats and Lillooet. Branding illegally: One, at Clinton. Dealing in stock without a licence; Three, one at Matsqui and two at Ashcroft. Shipping without brand inspection: One, at Invermere. Shipping beef without Form 4: Five, at Oliver.

The number of brands recorded, renewed, etc., during 1940 was as follows:—

	Recorded.	Renewed.	Reissued.	Transferred.	Total.
Cattle-brands	174	377	50	39	640
Horse-brands	103	193	27	16	339
Totals	277	570	77	55	979

The percentage of owners renewing their brands in 1940 is again a record—74 per cent., the Indians showing 77 per cent.

The number of licences issued was: Hide-dealers, 82; slaughter-house, 51; beef-peddlers, 13; stock-dealers, 59; horse-slaughterers, 22.

CATTLE AND HIDE SHIPMENTS.

Cariboo—	Cattle.	Hides.
Williams Lake	8,566	395
Lac la Hache, Soda Creek, Quesnel	1,614	1,189
Clinton, Lone Butte, 100-mile House, Lillooet, Pavilion	4,348	870
Bella Coola	----------	83
	14,528	2,537

	Cattle.	Hides.
Kamloops, Nicola, etc.—		
Kamloops, Chase	6,256	2,557
Nicola	6,472	990
Ashcroft, Lytton	1,858	574
Salmon Arm	520	1,042
	15,106	5,163
Okanagan—		
Vernon, Lumby	674	2,537
Armstrong, Enderby	195	815
Kelowna	252	1,883
Penticton	450	815
	1,571	6,050
Similkameen—		
Princeton, etc.	701	1,272
Oliver	960	623
	1,661	1,895
South-east British Columbia—		
Grand Forks, Greenwood	850	765
Nelson, Creston, etc.	5	2,773
Cranbrook, Fernie	448	1,320
Invermere, Golden, etc.	668	1,361
	1,971	6,219
Central British Columbia—		
Prince George, Vanderhoof, etc.	797	663
Smithers, Telkwa, etc.	569	782
Burns Lake	1,277	138
	2,643	1,583
Peace River—		
Pouce Coupe, Fort St. John, Dawson Creek	2,542	1,007

TOTALS COMPARED.

District.	1940.		1939.		1938.	
	Cattle.	Hides.	Cattle.	Hides.	Cattle.	Hides.
Cariboo and South	14,528	2,537	16,095	2,513	18,632	2,382
Kamloops and Nicola	15,106	5,163	16.334	5,345	18,564	6,005
Okanagan and Similkameen	3,232	7,945	3,283	10,308	4,702	9,859
South-east British Columbia	1,971	6,219	1,933	7,024	874	7,665
Central British Columbia and Peace River	5,185	2,590	3,950	2,210	7,897	1,578
Grand totals	40,022	24,454	41,595	27,400	50,669	27,489

REPORT ON BOYS' AND GIRLS' CLUBS.

S. S. PHILLIPS, B.S.A., SECRETARY.

In presenting the annual report on Boys' and Girls' Club Work for the year 1940, I wish to draw particular attention to the fact that a British Columbian has been elected President of the Canadian Council on Boys' and Girls' Club Work for 1940–41 at the annual meeting held in Toronto in November. The directorate of the Canadian Council is as follows:—

President—J. B. Munro, M.S.A., Deputy Minister of Agriculture, Department of Agriculture, Victoria, B.C.

Vice-President—S. C. Wright, B.S.A., Department of Agriculture, Charlottetown, P.E.I.

General Secretary—A. E. MacLaurin, B.S.A., 463 Confederation Building, Ottawa, Ontario.

Honorary President—F. M. Morton, Vice-President, International Harvester Co. of Canada, Ltd., Hamilton, Ont.

Honorary Vice-President—Stanley Wood, B.S.A., Superintendent, Live Stock Division, Department of Agriculture, Fredericton, N.B.

While Junior Club Work has decreased in membership and number of clubs in 1940, the interest of boys and girls in their agricultural and live-stock projects has been maintained at a high level. The fact that national contests have been restored following their discontinuance in 1939 will have a beneficial effect. However, while 'teen age farm boys are looking forward to enlistment in His Majesty's Forces, there is a probability that the Clubs during the next year or two will be composed of younger children—those under enlistment age.

The following list shows the number of projects undertaken in 1940 by Boys' and Girls' Club organizations in British Columbia, under departmental supervision:—

Project.	1939.		1940.	
	Clubs.	Membership.	Clubs.	Membership.
Dairy calf	34	388	29	326
Beef calf	9	101	4	45
Swine	8	84	3	40
Sheep	1	7	1	8
Poultry (baby chick)	57	566	21	210
Poultry (eggs)	25	227	35	330
Potato	17	227	16	232
Grain	2	17	2	19
Seed-growing	1	15	2	18
Alfalfa	2	33	2	33
Totals	156	1,665	115	1,261

A comparison of the above figures shows a decrease from 1939. There are possibly several reasons for this decrease. The District Agriculturist of the Kamloops District enlisted for Active Service early in the season, which left that office without club supervision during the period of club organization. The National Judging Competition was cancelled for 1939, and it was not definitely decided to hold a competition for 1940 until quite late in the season. On account of the uncertainty of the National competition, no Provincial elimination contest was held. In spite of the fact that the Provincial club organization did not have the benefit of these contests, it is quite certain that interest in club-work has not suffered by the slight decrease noted by a comparison of the above figures.

No new projects were added during the year as the number now provided appears adequate for present requirements. The rules and regulations appear quite satisfactory and no revision should be necessary for the coming club-year.

JUNIOR FARM FEATURES AT PROVINCIAL EXHIBITIONS.

Public interest in Boys' and Girls' Club exhibits was as keen as ever. The Vancouver, Victoria, Armstrong, Chilliwack, and smaller fairs continued to feature exhibits of stock, poultry, field and garden produce. Judging competitions were held at all the larger exhibitions. The number competing was larger than usual and competition keener. Reports on these activities are included in the reports of District Agriculturists.

NATIONAL JUDGING COMPETITIONS.

It was decided quite late in the season to hold a National contest in 1940. No Provincial elimination contest had been held in British Columbia and as the 1939 winners were eligible to take part in the 1940 contest, it was decided to send the teams selected last year.

The winners for 1939 were as follows:—

Dairy Calf Project: David Hope and Ralph Lockhart, of Armstrong; members of Armstrong Dairy Calf Club.

Swine Project: Vernon McCallan and James Thornton, of Armstrong; members of Armstrong Swine Club.

Potato Project: Gordon Davis and Chas. Freeman, of Milner; members of Milner Potato Club.

Poultry Project: Ralph Heune, of Coghlan, and Douglas Hopkins, of Langley Prairie; members of Langley Potato Club.

All except one of the contestants were able to take part. Unfortunately Jas. Thornton, member of the Armstrong Swine team and now on Active Service, was unable to go on account of an attack of influenza. Richard McCallum, of the Armstrong Swine team, was selected to take Thornton's place.

The teams from British Columbia were in charge of G. A. Luyat, District Agriculturist for Kamloops District.

The standing obtained by our teams in this contest was as follows: Potato project, second; Poultry, third; Dairy Cattle, fifth; Swine, seventh.

This was not quite as good a showing as our teams have made during recent years and shows the necessity for more training and the need for an annual Provincial elimination contest.

Much interest in club-work is evident in the rural districts. During the season I had an opportunity of discussing club-work along with crop production and soil improvement methods at a number of meetings held by Farmers' Institutes and other organizations.

On November 24th, acting on your instructions, I visited the Cariboo, Prince George, Lakes, and Bulkley Districts discussing club organization. A full report of this trip is attached.

Meetings during the year were held at the following places:—

Date.	Place.	Organization.
April 4	Denman Island	Farmers' Institute.
,, 7	Hornby Island	Farmers' Institute.
,, 25	Pender Harbour	Extension School.
July 17	Revelstoke	Dominion Department of Agriculture Field-day.
Oct. 19	Nanaimo	Farmers' Institute.
Nov. 20	Hornby Island	Farmers' Institute.
,, 21	Denman Island	Farmers' Institute.
,, 27	Kersley	Farmers' Institute.
,, 28	Woodpecker	Farmers' Institute.
,, 29	Prince George	Farmers' Institute.
Dec. 2	Vanderhoof	Farmers' Institute.
,, 3	Fort Fraser	Farmers' Institute.
,, 4	Uncha Valley	Farmers' Institute.
,, 5	Danskin	Farmers' Institute.
,, 6	Francois Lake	Farmers' Institute.
,, 7	Forestdale	Farmers' Institute.
,, 9	Driftwood	Farmers' Institute.
,, 10	Quick (1 p.m.)	Farmers' Institute.
,, 10	Telkwa (8 p.m.)	Farmers' Institute.
,, 11	Smithers	Chamber of Commerce.

In addition to holding meetings, many farmers and others interested in this work were visited during the season. Their impressions were noted and reported.

Considering all the factors influencing club-work, it is my impression that we have had a fairly successful year.

With reference to meetings held in Central British Columbia, the Vanderhoof meeting held on December 2nd was attended by twenty-five farmers and business-men. In addition to junior club work, a number of local problems were discussed, such as the marketing of hogs and surplus oats produced in the district this year. It was the opinion of the meeting that it would be impossible to ship out a car-lot of hogs. The marketing of oats came in for con-

siderable discussion. The best price obtainable being $12 per ton at Vanderhoof. Oats appeared to be the only grain crop produced in any quantity, a dangerous production policy for a mixed farming district such as Vanderhoof which could produce peas, wheat, and barley which could be fed in proper proportions with oats to properly finish live stock.

The meeting at Fort Fraser was fairly well attended with an attendance of about twenty-three, but marketing problems did not come in for a great deal of discussion at this meeting. Meetings were held at Uncha on December 4th, Danskin on December 5th, and Francois Lake on December 6th.

Uncha is a comparatively newly settled district and as such has numerous production problems, such as getting sufficient acreage cleared to successfully produce farm produce and determine what crops and varieties to grow. Oats are being produced but more grain such as peas, wheat, and barley is needed to conduct mixed farming operations successfully. It should be pointed out that the farmers should endeavour to produce and hold two years' seed-supply to offset frost danger which might ruin the crop some years for seed purposes.

Both Uncha and Danskin districts have good Beef Calf Clubs and the junior farmers showed considerable interest in this work. The Francois Lake meeting was held in the Institute Hall, a considerable number being in attendance.

I was well pleased with the meeting at Forestdale, which was held in the school on December 7th. In spite of 3 feet of snow, most of the leading farmers, their wives, and a good number of school children were present. All showed interest in club-work and after the meeting it appeared that certain projects would be organized for the coming year.

The meeting at Driftwood on December 9th was one of the best meetings, about sixty farmers and children being present. All were interested in club-work. One pleasant feature of this meeting was the presentation of the Royal Bank of Canada challenge cup for the winning Dairy Calf Club in the district inter-calf club competition. The cup was won by the Driftwood club, coached by Ray Oulton of Driftwood. The cup was presented by Mr. Dando, manager of the Royal Bank at Smithers, who complimented the members on the work, assuring them of his interest and support to the club-work of the district.

The attendance at the meeting held at Quick on the afternoon of December 10th was small, but those present showed interest in club-work, which was evident by the fact that a splendid Calf Club was organized in the district this year and coached by Roy Annis, Bulkley Valley Cow-tester. Mr. Annis is popular in his district and his work is much appreciated by the dairy-farmers.

A fairly well attended meeting was held at Telkwa on the evening of December 10th, in spite of the fact that roads were slippery and travel by car was dangerous. Many of those responsible for the development of club-work in the district attended this meeting, including C. J. Killer, Tom Thorp, Frank Dockrill, C. Bussinger, Joe Clarkston, H. Willis, Norman Bree, and the chairman of the meeting, Robert Donaldson, one of the members of the 1929 Bulkley Valley judging team which brought back the agronomy cup from the last New Westminster exhibition held in tents in 1929.

On December 11th a meeting was held by the Smithers Chamber of Commerce. This was not a public meeting, but was attended by only members. Instead of a talk on junior clubs, a discussion was held on club-work and the best means to promote this work. It was evident that the officers and members are interested in club-work and are prepared to assist in the development of projects that will fit in the district production plan.

GENERAL REPORT ON CONDITIONS.

Settlement.—During recent years quite a number of new settlers have entered the district. Swiss settlers located around Telkwa and Smithers are reported to be doing well. Also Dutch settlers located in the Houston District appear to be making progress. Last year a number of Mennonites were located in the Cheslatta District and they produced good crops, in spite of the fact they were late getting on the land.

The agricultural picture of Central British Columbia has decidedly changed during the past twelve years. When I first visited the Bulkley Valley in 1928 railway-ties was the important cash crop even for many of the farmers. It was estimated that tie contracts were worth half a million dollars along the entire line from Rupert to Jasper. I was informed that this year from District " B " there would be about 260 to 280 tons of timothy-seed shipped out, valued at $40,000, and the seed-crop was light this year. It is estimated that the creamery at

Telkwa will pay farmers for butter-fat about $35,000. About eighty cars of beef and mixed stock have been shipped out at a value of about $70,000 and farmers are now more concerned with the prices paid for these farm products. The heavy shipments of beef indicate a possible shortage of hay in the district.

There are now three creameries, located at Prince George, Vanderhoof, and Telkwa. Altogether they made approximately 400,000 lb. of butter this year; the Telkwa plant producing more than half of this amount. The farmer is now receiving 29 cents per pound butter-fat which is 10 cents a pound higher than last year. The bulk of the butter is, of course, produced in the summer. It is apparent that these creameries are a great help to the district and according to local merchants the farmers who are milking cows are paying their store bills.

Although Central British Columbia is considered an unorganized district it is approaching a point where considerable study will have to be given the marketing of produce and live stock. Many farmers complain that they have both hogs and produce such as potatoes for which they cannot find markets. Much study will have to be given to grading and producing the quality of product demanded on the market.

REPORT OF WOMEN'S INSTITUTES BRANCH.

MRS. V. S. MCLACHLAN, SUPERINTENDENT.

The key-note of Institute work during the year has been the production, conservation, and marketing of British Columbia products. This work has been stressed by the "War Chest Scheme" outlined by the Bulletin, by the Provincial Conference, and by Mrs. M. Murray's "Wool-filled Comforter Scheme."

War Chests established by most Women's Institutes have canned a great deal of surplus fruit and vegetables. To date, reports from sixty-two Institutes show that well over 7,672 lb. of fruit and vegetables have been canned or preserved and given to the Red Cross Conservation Committee. Mrs. J. F. Price, Vice-Chairman of the Provincial Board of Women's Institutes, is also Chairman of this Red Cross Committee and states that Institute work along these lines has been of the highest quality. Through the War Chests also very large quantities of made-over clothing have been available for instant dispatch for the Lord Mayor's Fund and other appeals.

The Provincial Conference, held in Vancouver on August 28th, 29th, and 30th, centred round "Agriculture in War Time," with special reference to seed production. Over 200 delegates from all over the Province displayed a lively interest in the addresses and discussions. There is no doubt that the Biennial Conferences held in recent years have done a great deal to weld together the Institutes and bring them into closer co-operation with the Department. Communications from the Department are read with careful attention and in most cases requests are complied with promptly.

After many years' service in the cause of the Women's Institutes, Mrs. McGregor, Mrs. Noble, and Mrs. Pitts resigned from the Provincial Board and a new Board was elected with Mrs. B. F. Gummow, Peachland, as President; Mrs. J. F. Price, Vice-President; Mrs. V. B. Robinson, Penticton, Secretary-Treasurer; and Mrs. K. Popoff, Slocan City, and Mrs. A. Hartnell, Shearerdale, as Directors.

British Columbia's "Wool-filled Comforter Scheme" arose out of an appeal from Mrs. George Murray. Institutes were invited to make comforters filled with the lower grades of British Columbia wool and covered with any odd pieces of good material to be sent to England for the bombed-out people. The plan was welcomed by every Institute in the Province as a way in which every woman could give practical assistance through her own personal work. In the Peace River outside organizations asked to be allowed to contribute comforters. Lasqueti Island apparently enlisted the aid of the whole community and sent in eleven beautifully made articles in the gayest patterns. At Robson a Doukhobor woman asked to be allowed to wash the wool—no mean offer in winter weather when all water must be pumped and carried. In Victoria one member washed 30 lb. of wool for their donation of ten comforters. More than 400 comforters have been received in the Superintendent's office. Through

the great kindness and co-operation of Mr. Pease, of the Red Cross Superfluities Shop, Victoria, the comforters have been sent to Canada House without any charge for freight. The scheme is so popular it seems likely to become a permanent Institute war activity. Each article is labelled with the name of the Institute which sent it, and also bears an embroidered label, " A gift of B.C. Wool made by the B.C. Women's Institutes."

In June, after the meeting of the Provincial Board to plan the Biennial Conference, accompanied by Mrs. H. McGregor, Provincial President, I attended a rally of the North Vancouver Island Institutes held on Denman Island, and then went on to Kamloops, Nelson, Kaslo, Creston, Grand Forks, and Nakusp. At each of these centres the local Institute organized a rally for surrounding Institutes, at which keen discussions took place on future plans and accomplished work. On my way home I attended the District Conference of the Okanagan Institutes at Winfield, where similar work was carried on.

Ever since war was declared Institutes have been urged to co-operate wherever possible with recognized war organizations, but to maintain their own identity, so as to carry on their community and welfare work, maintain the health of the children, and provide a valuable channel for information on the war programmes advocated by the Government. As a result of this advice only one Institute has lapsed during the year; namely, Appledale, in the Kootenays. This was always a small Institute and since the outbreak of war so many women have left the district that there are not enough left to keep the organization going.

Six new Institutes have been organized during the year; namely, Pemberton and Bella Bella, in the North Fraser District; North Bridge Lake, Pritchard, and Trinity Valley, in the Salmon Arm District; and Clayhurst in the Peace River District.

The South Fraser District Women's Institutes held a Conference at White Rock. The North Fraser District cancelled theirs on account of the Provincial Conference. The South Vancouver Island District Conference took place in Victoria and rallies of a few near-by Institutes were held in Denman Island, Kamloops, Nakusp, Creston, Nelson, and Grand Forks. There are now 186 Institutes in the Province, with a total membership as at June last of 4,490.

Although war-work is the main interest, most Institutes are carrying out their usual programmes and maintaining the usual community activities. Flower Shows were reported by nine Institutes and five organized School Gardens for the children, Grindrod holding a competition for three school districts, which was most successful. Six Institutes have reported organizing poultry, pig, or calf clubs.

In addition to the wool-filled comforters and the canning, an amazing amount of sewing and knitting has been accomplished for the Red Cross. Reports from only sixty-two Institutes show that 13,065 articles have been made and $3,452 collected for Red Cross Funds. In addition, War Savings Certificates to the value of $1,134 have been purchased by the Institutes, which also do much work in supporting all the local sales drives. Every Institute apparently sent parcels to their local men on Active Service, as well as responding to many other appeals for aid, for War Funds, the Salvation Army, Solarium, and the Crippled Children's Hospital.

In June an Order in Council approved a new set of Rules and Regulations for the Women's Institutes. As these will necessitate alterations in the constitution of the individual Institutes, this office is now working on changes in the by-laws to conform with the new rules.

The Institute Bulletin has been sent to about 250 individuals each month and appears to maintain its popularity.

REPORTS OF DISTRICT AGRICULTURISTS.

During the year there have been a number of retirements, appointments, and readjustments made in the personnel of our Extension Service. H. E. Waby, after seventeen years as District Agriculturist for the Salmon Arm District, retired on superannuation on April 1st and Wm. MacGillivray was appointed to succeed him in this area, which extends from the Shuswap Lake to the Alberta boundary in the agricultural valleys along the main-line of the Canadian Pacific Railway. Mr. MacGillivray is also field officer in charge of the Columbia-Kootenay Valley.

At the end of June Donald Sutherland, District Agriculturist at Kamloops, retired to accept a commission as 2nd Lieutenant with the Rocky Mountain Rangers. He was succeeded by G. A. Luyat, formerly District Agriculturist at Williams Lake.

The position of District Agriculturist at Williams Lake was filled by the appointment in August of Dr. Wm. T. Carlyle, whose training in agriculture and veterinary science qualifies him for work in an area where field crop production and the live-stock industry are paramount agricultural undertakings.

The office of District Agriculturist for the Lower Fraser Valley was rendered vacant by the resignation at the end of October of R. G. Sutton, who, after twenty years' service with the Department of Agriculture, accepted an appointment as farm manager at Tranquille. Mr. Sutton has been succeeded by G. L. Landon, formerly District Agriculturist at Grand Forks. The Boundary and Grand Forks District will continue to be served by Mr. Landon pending the appointment of a qualified agriculturist for that district.

LOWER MAINLAND DISTRICT.

R. G. Sutton, B.S.A., District Agriculturist.

The season of 1940 made something of a new record in weather conditions for the Lower Mainland, being extremely dry throughout. The winter was remarkably mild with practically no snow and frequent rains, then after the usual early spring rains the weather settled down to a dry period which continued almost uninterruptedly until fall, with nothing more than local showers until the middle of October. This long period of dry weather has, of course, reacted on crop yields as will be noted in the following sections.

The live-stock situation is fairly stationary in this district. Dairy cattle wintered easily and well and came out on grass in good shape. Pasture was good during spring, but naturally fell off with the hot weather and has been somewhat tardy in coming back in the early fall. There was a marked decline in summer milk production due to this shortage. The health of the dairy stock continues to be generally good, or at least up to the average. The general tendency has been to raise practically all heifer calves as far as possible, and the result is some fine young stock coming on throughout the district. The value of Cow-testing and Record of Performance work is well recognized and it would appear that more cattle are on test than formerly. Prices for milk cows seem to have risen 10 to 20 per cent.

As mentioned in last year's report, there was a big increase this year in the number of sows bred for spring farrowing, and as a result, the late spring showed a weakening of the market for young pigs. The general hog situation with regard to bacon export has been too well discussed in the press to warrant any further comment here, other than to note it has had the effect of reducing, to some extent, the number of brood sows kept for fall farrowing. It is hoped, however, that this reduction will only be temporary, as at the time of writing the prospects seem brighter. Good litters have been raised throughout the season, and while there have been a few cases of trouble with disease this does not appear to be larger than the average.

Among sheep-breeders, a distinct change has been noted in that the demand for breeding ewes was very keen last fall and this summer, and the breeders have been trying to increase their flocks as far as possible. This indicates that there will be an increase in the wool-clip next year and also an increase in the lamb-crop.

Interest appears to remain much the same in draught-horse production with a considerable number of fine young colts being raised. Prices have remained much the same.

Live stock generally are going into the winter in good condition and feed supplies appear to be ample.

Due to the very mild winter there was little, if any, winter-killing in clover-crops. The hay-crop was a little lighter than last year but was put up and brought in under ideal weather conditions; thus, while the tonnage will not be as great as last year, the quality is better and there is considerable old hay left over from last year.

Seeding was general about April 15th and was concluded without the wet weather interruption which featured last year's work. Harvesting weather was good and the percentage of grain lost through lodging will not be as great as last year. Yields would be a little below the average. The corn-crop made excellent growth this year. While some of it was slow in

starting, due to shortage of moisture at planting-time, it has come on well and matured excellent stands.

Root and potato crops are a little below the average in tonnage, due to the dry summer. Following a few days of showery weather in late August, a late blight infestation appeared on the potatoes and where they were not sprayed the tops went down badly and some varieties in some locations have rotted badly before digging. Some growers estimate that the loss of rotted tubers will be as high as 30 per cent., but this is not at all general.

Red-clover seed production is up this year because with the prospect of a higher price practically all stands of red clover have been threshed. In a number of cases, old pastures have been cut over and threshed for what seed they would yield and red-clover was threshed this year in areas where it has never been threshed before. The total estimated yield for this district this year will probably be something over 100 tons. The per acre yield is difficult to estimate because it has been extremely patchy, yielding high on some soils and very low on others where moisture was short.

As was the case last year, this office has been asked to co-operate with the Provincial Relief Branch in handling a quantity of work in connection with the Assistance to Settlers Plan and, if anything, the work has increased over other years. During the year, a number of new applications have been inspected and reported on and in the neighbourhood of 100 purchasing inspections have been made, covering requisitions for such things as stumping-powder, seed, lime, fertilizer, implements, cattle, horses, swine, goats, and poultry.

Much the same routine work has been done on seed-promotion work as in other years in the way of advice and assistance in production of seed. The one main feature in evidence has been the attempt at sugar-beet seed production on a commercial scale. Working in conjunction with the Dominion Seed Branch, a number of farms were canvassed and advice given, with the result that there is this year, maturing for a seed-crop next year, some 200 acres in sugar-beets.

There has been a small increase in the acreage devoted to mangel-seed production and also production of vegetable-seed.

New settlers continue to call at this office for information and assistance and there has been a noticeable increase in the number over last year.

While the work of the Field Crop Union goes ahead in this district, and while this office has been supplied with a list of all trials conducted in the district, time has not been found to give very much attention to this work.

Farmers' Institutes, fall fair organizations, cow-testing associations, and some other agencies have called on this office for addresses on different subjects at different times during the year. As far as possible, these meetings are attended. Approximately ten breed field-days and ploughing-matches were attended and subjects pertaining to the work discussed both formally and informally.

This year shows another increase in warble-fly control work. Treatment started about February 26th, practically the same time as last year. The work was done in the same way as last year; that is, the control was organized at the request of some local organizations and with the assistance of local committees. Preliminary surveys were made and committee meetings attended. In this way, local committees were enabled to bring the organization to a point where on an appointed day all cattle in one area were treated.

Central points were arranged where the solution was mixed in bulk then distributed to group leaders who were each responsible for a certain number of herds. By way of example, the Chilliwack district comprises some 761 herds, or 13,350 head of stock. All the solution necessary for this job was mixed at one point the day before that set for treatment. A total of 74 lb. of Rotox was used to mix up 148 gallons of solution. This was mixed in old 8-gallon milk-cans and distributed among fifteen group leaders, each of whom was responsible for treating all the cattle in his own area.

For all districts treated for two treatments, a total of 332 lb. of Rotox was used. This made up 664 gallons of solution which was all mixed by hand at twelve different points. The following table will give the figures for each district:—

District.	No. of Herds.			No. of Head of Stock treated.			Estimated No. of Warbles found.		
	1938.	1939.	1940.	1938.	1939.	1940.	1938.	1939.	1940.
Agassiz	116	141	145	1,184	1,647	1,739	4,143	3,036	3,704
Barnston Island	18	18	.....	303	300	.....	124	10	.....
Chilliwack and Atchelitz	.....	907	761	.....	14,074	13,350	.....	22,742	11,213
Colony Farm	.....	.....	1	.....	.....	310	.....	.....	316
Dewdney	88	89	106	1,717	1,713	2,317	5,431	3,243	2,613
Glen Valley	.....	.....	63	.....	.....	969	.....	.....	4,847
Harmsworth	.....	7	8	.....	78	105	.....	195	95
Hatzic	33	37	.....	466	570	.....	859	1,105	.....
Matsqui	.....	.....	166	.....	.....	2,871	.....	.....	12,839
Mount Lehman	.....	.....	112	.....	.....	783	.....	.....	3,016
Poplar	.....	8	12	.....	83	90	.....	987	706
Pitt Meadows	89	110	109	1,533	2,167	2,181	3,476	3,742	1,556
Sumas (including Yarrow)	.....	236	337	.....	4,038	4,756	.....	25,278	13,762
Totals	344	1,553	1,820	5,203	24,670	29,471	14,033	60,338	54,667

Comparison.

Year.	No. of Herds.	No. of Head treated.	Estimated No. of Warbles.
1938	344	5,203	14,033
1939	1,553	24,670	60,338
1940	1,820	29,471	54,667

In each of these districts a second treatment was carried out approximately three weeks after the first, but with the early spring seeding coming on the second treatment was not as thorough as the first, and a third treatment was impossible. Speaking generally, the solution used has been found to be 100 per cent. effective and in the majority of districts the local organization is good, but in one or two areas there was some difficulty in arousing sufficient interest to get enough workers to make complete coverage, and in the coming year, should there be evidence of lack of interest in any district, the project in that district will be dropped.

The following table shows the number of junior clubs as compared with the last two years, and indicates that there is no very substantial decrease this year as compared to other years.

Year.	Swine Clubs.	Calf Clubs.	Poultry Clubs.	Potato Clubs.	Seed-grain Clubs.	Total.
1938	2	15	14	5	....	36
1939	2	20	31	9	2	64
1940	1	17	20	8	2	48

In these forty-eight clubs, there was a total of 506 members.

There was one swine club this year and it is quite possible that this will be discontinued next year as interest certainly centres round calf clubs, potato clubs, and poultry clubs.

Calf clubs have established themselves possibly more than any other project and have made splendid showings at local fairs and exhibitions. At several local fairs in the district calf and swine clubs exhibited their stock; also at Vancouver and Chilliwack Exhibitions there were large club exhibits and programmes. At Vancouver there were ninety-nine calves exhibited, all from clubs in the district. A total of 276 entries was made by club members in the junior section, and these entries were made by a total of 139 local boys and girls. At Vancouver Exhibition this year, the calf-club exhibit was made a feature of the evening

performance and was probably the best junior exhibit ever staged at Vancouver, and in the opinion of A. E. MacLaurin, of Ottawa, was the second best such showing made in Canada.

The returns are not all in yet for the potato and grain clubs, but indications are that these are equally good as compared with last year.

In the majority of centres where live-stock clubs are organized, judging classes are also carried on. Owing to the large number of clubs in the district, these classes have to be left almost entirely in the hands of local leaders, but assistance has been given wherever possible and judging classes and contests have been held at all the breeders' field-days mentioned above.

Your representative also organized and supervised the entire club programme at Vancouver and Chilliwack Exhibitions. At Vancouver this included the main open judging contest, judging of the exhibits, inter-club contests, showmanship, and halter-making contests. In the judging contests there were fifty contestants; in the inter-club contest nine calf clubs, representing approximately fifty calves; and the showmanship contest brought out seventy-three contestants.

Four boys from the Fraser Valley made the trip to Toronto, representing the Province in the Canadian Council competitions. The potato-judging team, Charles Freeman and Gordon Davis, were members of the Milner Potato Club. The poultry-judging team, Ralph Huene and Douglas Hopkins, were members of the Langley Poultry Club. These club members won the elimination contest at the Vancouver Exhibition competitions in 1939 but did not go East until 1940, owing to cancellation of the Toronto Royal Winter Fair in 1939.

The potato team won second place and the poultry team third place in the final competitions. This is to be considered very satisfactory in view of the fact that a year had elapsed since their elimination competition.

The boys report an excellent trip with opportunity to associate with club members from the other Provinces. Two days were spent in Ottawa.

KAMLOOPS AND NICOLA DISTRICTS.

G. A. Luyat, B.S.A., District Agriculturist.

The light snowfall caused some anxiety to the ranchers and farmers of the district whose reservoirs and irrigation systems depend solely on winter moisture in the form of snow. Some effect was noted as a result of the light snow covering, particularly toward the end of the growing season, when the second cutting of alfalfa was light in places. Spring work got away to a good start, the land being in a fit shape to till quite early. Intermittent showers during the spring helped plant-growth, which made steady progress until the middle of June. The summer was accepted as one of the hottest and driest experienced for years. No moisture fell in any quantity until late autumn and those growers with a good supply of soil-moisture had perfect conditions under which to harvest their crops. The first sign of frost was not apparent until the end of October, giving the truck and tomato growers a longer season than they have heretofore had for many years. The first fall of snow and cold snap came together in early November, with temperatures dropping to zero at the lower altitudes, but this lasted only five days, when conditions became mild and remained such without any appreciable depth of snow until the turn of the new year.

There was a steady improvement during the year in the markets and prices reached a level which compared almost to those received in the peak year of 1928. At Nicola points prime grass steers sold f.o.b. shipping points for $7.25 to $7.50 per cwt.; heifers, $6.25 to $6.50. Cows did not find such a ready market and several shipments were directed east at prices somewhat better than could be had on the Vancouver market. In general, cows sold for prices ranging from $4.25 to $5 per cwt. A good market was established for stocker steers and heifers late on in the fall, these selling at prices ranging from $6 to $6.50 per cwt., f.o.b. Kamloops. Several loads were brought into Kamloops by commission firms from the Peace River District through the medium of the Edmonton stockyards. Perhaps because the price levels were high and owing to some extent to an anticipation of a long, hard winter ahead cattle moved in greater numbers to market this year. Competition in the field during the shipping season was quite keen, another factor which prompted cattlemen to sell in heavier quantities.

Range conditions were not equal to those of 1939 owing to the lack of rainfall to freshen up the grass during the course of the summer, and as a result some of the animals did not

show the condition and bloom. Many of the watering holes dried and those remaining held the cattle in too close confinement for the chance the grass had under the conditions existing. Steers which were herded at the higher elevations on the summer ranges went to market in good flesh. The calf-crop of this year, advantageously affected by the ideal season of 1939, was a heavy one, the number of dry cows being cut down to a minimum.

The Sheep-breeders' Association, with headquarters at Kamloops, report that 212,952 lb. of wool were shipped from the vicinity of Kamloops and the Nicola Valley. The average price of the clip was 21 cents net to the grower. Some difficulty was experienced at first to market the finer wools, which finally were disposed of on the Boston market. The sheep population seems to be on the increase with more small flocks making their appearance in and about the mixed farming communities. Near-by all the semi-large bands are taken to the higher altitudes for summer grazing and herded on a community basis. Range which cannot be used by cattle is brought into very profitable production under this system. Two bands were dispersed during the year; that owned by Muir Watson, Savona, with 1,500 head, and that of Threlkeld and McMorran, Walhachin, with 800 head. Six car-loads of range yearling ewes were brought in from Alberta. Rams were not in demand this year, primarily because many of the larger sheepmen were filled up from last year and because some of the flock-owners are still using grade rams.

Sheep ranching in this district, properly undertaken, has always been a profitable enterprise as well as a remunerative side-line to the flock-owner. Dogs do not appear to have given much trouble anywhere in the district amongst flocks.

The number of milch cows kept on the farms has not shown any substantial increase during the year. There has been a living made by most of the operators, but butter-fat prices have not been sufficiently remunerative to encourage further production of this commodity. In a great many instances where the income derived is small a general weeding of poor producers could be made. Butter-fat prices for the summer months has been 19 cents, with a slight increase paid for winter cream.

The hog population of the district took on quite a substantial increase during the year as a result of a number of brood sows being imported in December, 1939, and to the number of the better gilts raised here being passed on for breeding purposes. A number of boars of good breeding have been introduced in the hog-raising communities. There was a tendency for many hog-raisers to sell off their herds and particularly feeder-hogs when hog rail-grading regulations came into effect October 1st. Rumours circulating about the severeness of the Act and the general unfamiliarity of the public with its application and aims caused many growers to avoid facing the regulations at market points. Some growers thought they could avoid the teeth of the regulations by selling to dealers who, on the strength of the false information, cut the prices down to the grower and then proceeded to sell under the Act, thus reaping the benefits of the cut in price as well as the premiums paid on the good lots of hogs. The local market in Kamloops has been for the most part very dull, primarily because the trade demands a very light hog which is at an age when it can not, under any circumstances with the prices paid, be sold at a profit. With rail-grading regulations now in force it will be necessary to have shipments made at regular intervals and a breeding and feeding programme set up accordingly.

The horse market has been very dull and draggy during the year. In the last five years a great number of horses have been raised on the lower Fraser Valley farms and the need for replacements from the Interior is declining steadily. The light-horse rearing is still quite active in the immediate surrounding community to Kamloops. On the ranches light horses suitable for saddle work have commanded good prices and replacement stock has been available from some of the larger operators.

Poultry-keeping has been quite a profitable undertaking during the year. Together with good prices received for eggs and the low price of wheat the income from this line of agriculture has surpassed that from other phases of farming of the same scale. Grade A large eggs have commanded a price of 40 cents per dozen to the producer during the autumn months. At the close of the year there was a sharp decline in the price. Turkeys brought 25 cents per pound to the producer.

Generally speaking, all crops made very favourable progress until early summer when the intense heat retarded the growth considerably. Reports indicate that very little if any

winter-injury occurred in winter wheat or alfalfa. The winter wheat sown in late August and early September of this year had difficulty in germinating owing to the long period of drought. Yields of winter wheat were fair while those of spring wheat were quite low compared to those of 1939. Prices received for milling wheat were as low as $18 per ton f.o.b. Kamloops, and with this there has been difficulty moving the crop. Coarse grains yields were low and the prices poor, with the result that much of this crop is being fed to steers and hogs. The potato-crop was a little heavier than normal. The first cutting of alfalfa was quite heavy and was stacked under ideal conditions. The second crop suffered some in places from drought where irrigation-water was lacking. It too was harvested under ideal conditions.

This office was taken over by your representative late in the season with Lieutenant D. Sutherland, former District Agriculturist, resigning in June. Through this occurrence there was not the usual follow-up on the various projects started by him in the spring.

The following clubs with their membership were organized during the spring:—

	Members.
North Kamloops Beef Club	7
South Kamloops Beef Club	8
Westwold Beef Club	5
Westwold Lamb Club	15
Kamloops Swine Club	7

As a result of the Kamloops Exhibition not being held this fall, where the juniors usually come together for competition, it was decided to hold the junior show at the time of the winter fair. Judging competitions and showmanship contests were held in each division for the respective club members. The standing of the members in their club was also determined. Frequent visits and demonstrations were made from this office to these clubs during the fall months.

The following chick clubs with their membership were organized:—

	Members.
Kamloops South New Hampshire	7
Kamloops North New Hampshire	6
Kamloops and District Rhode Island Red	6
Kamloops and District Barred Rock	5

The members showed their birds at the winter show held by the Kamloops Poultry and Pet Stock Association and a judging competition at this event was held for the members.

Assistance was given Dr. W. T. Carlyle in managing the Third Annual Cariboo Sale of Feeder-cattle at which 1,790 head went through the ring at good steady prices. The tendency this year was to use this sale as a medium for marketing cattle on the mature side, the offerings of yearling steers being rather light.

Under instructions, assistance was given in organizing the sale of the Provincial herd operated by the Tranquille Sanatorium. Every effort was made to split these cattle into suitable and convenient sale lots so that the smallest of operators would have an opportunity to purchase. Six hundred and sixty-three head grossed $36,117, with yearling and two-year heifers selling at high averages.

With the Vancouver Exhibition Association cancelling their winter fair during the duration, it was decided to carry on with this show at Kamloops, a point well located for such a project. With the permission of the Hon. the Minister, your representative acted in the capacity of secretary-manager. The sale was well patronized by Vancouver buyers seeking a special article for the Christmas trade. The total sales of 301 head of cattle, 778 head of lambs, and 131 head of swine amounted to $37,341.64, which was slightly under the total made at the first Christmas sale.

The hogs for the first time in British Columbia at least were auctioned off on the dressed-weight basis, subject to rail-grading at the packing plants but with the basic price established in the ring. The prices averaged $1 per cwt. better than the Calgary price of the day. Three lots of ten hogs owned by A. Comazzetto, Kamloops, made the highest basic price of $11.

Again the bulls at the annual Bull and Fat Stock Show sold well, with the Herefords averaging $257.60 with a top at $1,050; the Shorthorns $164.37 with a top of $255; the Angus $71.67 with a top of $85. In the market cattle section of the sale 367 head sold for a gross total of $26,925.49.

The third horse sale held at the time of the bull sale was another success, considering that the good, heavy, well-fitted draughters sold well. The average price paid was $114.76. Well-matched heavy teams sold at good, steady prices.

The ram sale was held on September 21st and 112 rams were offered, selling at poor prices. The highest price paid was for a Suffolk ram selling for $40. Quite a number of the Hampshire rams had to be passed out of the ring unsold, the lowest price the sale accepted was $20. At this sale a few pure-bred boars and gilts were offered and while the quality was excellent the demand was poor and many had to be passed out unsold.

During the winter fair, R. C. Trimble, official Live Products Grader from Vancouver, gave a demonstration on the rail-grading of hogs and as well outlined the regulations of the Act, pointing out how it would work advantageously for the grower of hogs who fed and bred his hogs properly and marketed them at the right weight. Three hogs were weighed, tattooed, and inspected alive and then slaughtered and examined on the rail. This demonstration served to fill a long-felt need for further knowledge on the new system of marketing hogs.

Two schools under the Youth Training Plan were held in the district, one at Knutsford and the other at Louis Creek. A good and appreciative attendance was had at both schools. As a result of former schools held, an active Youth Training Club was organized on the North Thompson River. Here meetings are held regularly twice a month and various matters of agriculture are discussed.

Your representative, on instructions from the Minister, acted in the capacity of secretary-treasurer to the Nicola Grasshopper-control Committee as well as the appointee of the Minister to the committee. Six committee meetings were held during the season and the annual meeting on October 26th. The total gross expenditure for the year amounted to $2,495.86. From 1939 to 1940 the net assessable cost of control was cut down $5,682.27. Mr. Buckell, of the Dominion Entomological Branch, made a survey of the Nicola zone and reported the grasshopper situation as very favourable with the infestations below normal, although he pointed out the valley should have had two peak years in populations as indicated by the egg-beds, but persistent poisoning and oiling of the egg-beds had brought about the favourable conditions. The mechanical bait-spreader, near perfection, would make it possible for areas of light infestation to be treated without waste.

WILLIAMS LAKE, CARIBOO.

Wm. T. Carlyle, B.S.A., B.V.Sc.

The year 1940 can for the most part be considered as having been one of very satisfactory operations for the ranchers and farmers of the Cariboo and Lillooet Districts. A favourable growing season was experienced, beef prices were higher, and satisfactory returns were had for sheep and pigs. January, February, and March were mild with little snow. Spring was early and warm with plenty of moisture in the ground as a result of the wet autumn of 1939. Moisture conditions throughout the growing season were normal. September and October were bright, dry months and fall frosts were long delayed. Winter came early, the first snow fell on November 2nd, and on November 6th there was a heavy fall with quite a cold snap following. From November 15th on, the weather has been fairly mild with the snow melting at the lower altitudes; however, much of the range land has been covered with a fairly heavy blanket of crusted snow.

Cattle prices received have been higher than those of last year. Prices received f.o.b. Williams Lake have averaged about $6.25 to $6.50 per cwt. for steers; heifers, $5.75 to $6.25; and cows $4 to $4.50.

The third annual feeder sale conducted by the Cariboo Livestock and Fair Association, of which your District Agriculturist acted as manager, was a very successful affair. This was the largest sale held to date and the prices were the highest of any so far. Eighteen hundred head of cattle were sold; average prices per cwt. were as follows: 147 yearling steers, $6.70; 878 two-year steers, $6.77; 57 three-year steers, $6.75; 286 yearling heifers, $6.46; 184 two-year heifers, $6.57; 202 cows, $4.25; 32 calves, $6.36; and 14 bulls, $3.50.

Additions to the P.G.E. stockyards were found necessary and eleven new pens were built. A new bull-barn was also constructed. The handling of the large number of cattle was greatly facilitated by grading small groups into car-load lots. This method also seemed to meet with the approval of both the sellers and buyers. These sales undoubtedly are of great

advantage as a marketing agency to the cattlemen of the district, especially so to the small cattleman.

The bull sale held on October 18th, the day following the feeder sale, was also very successful. Forty-nine Herefords brought an average of $186.83, twenty-one Shorthorns averaged $141.95, while the lone Galloway brought $150; with the highest price paid being $380 for a Hereford bull.

The quality of the cattle in this district is undergoing a steady improvement. No one feature is more responsible for this than the holding of this annual bull sale. Other good bulls are being brought in throughout the year, also cows and heifers of excellent type. It is interesting to note that five ranchers have lately made a start with a small foundation of pure-bred females.

Range feed conditions were satisfactory throughout the summer. This factor coupled with the previous mild winter resulted in the cattle that were marketed carrying a very good degree of fleshing.

The percentage calf-crop was higher than normal, some ranchers estimating it as high as 15 per cent. over the previous year. Satisfactory range conditions, together with the mild winter of last year, would largely account for this. With some ranchers the overcoming of mineral deficiencies has been a factor which has greatly increased their calf-crop. Controlled breeding also has yielded satisfactory results and this method could be used on all ranches where practical. Educational effort directed toward the proper handling of cases of Dystokia and retained placenta by the ranchers would seem worth while. Dystokia, especially in heifers where it mostly occurs, is greatly reduced where the pregnant animal has received a diet adequate in minerals.

The number of hogs now raised have made an outside outlet a necessity at certain times of the year. The shipping of such surplus to the Coast to be rail-graded and sold on dressed weights seems the solution. Producers, however, are so scattered that the collection of these shipments presents a problem. Hogs raised on or adjacent to the main Cariboo Highway can be picked up by trucks. There is hardly a sufficient volume to make up a car-load at one time of hogs of suitable market weight. An effort is being made to assist producers in sending their hogs out to market. Dressed prices received locally this fall have been higher than net prices obtained on hogs rail-graded at Vancouver; however, if the supply continues to exceed the local demand it is very doubtful if this condition will continue. Classes for hogs were held at the Cariboo feeder sale. An auction sale of these exhibits as planned could not be held. The refusal of buyers to bid was due to their unfamiliarity with the requirements of the rail-grading regulations. The hogs, therefore, were shipped to the Coast, the feeders to the stockyards, and the market hogs to a packing-house. Returns on the latter were on a rail-graded basis. While some hogs graded high, many were of the wrong type, weight, and finish. Brood sows and boars brought into the district last year under the joint Dominion-Provincial effort have improved the quality. Many hogs raised are not of bacon type and cross-breeding is too much in favour. In regard to feeding and management there is room for improvement. Pasture is too largely used and grain rations are inadequate.

Predatory animals continue to restrict expansion in sheep numbers. Coyotes are the chief offenders; bears and wolves occasion some loss. Some areas in the district are well suited for sheep; those breeders who have escaped losses find them very profitable, and there is no lack of interest. Four hundred and eleven lambs were shown and later auctioned off at the feeder sale. Prices realized for the bulk of the offerings were from 7 to 8¼ cents, the lower prices being for overweight lambs. The type of lamb raised in the district and their market finish was satisfactory. Flocks seem remarkably free of disease.

Average price of around 27 cents per dozen for the year was paid for eggs. Many are brought in from the Coast but a considerable premium is paid for local eggs. Producers have received around 43 cents a dozen during December. More eggs could profitably be produced during the months when there is a scarcity. Dressed turkey retailed for the Christmas trade at 25 to 30 cents per pound. One outbreak of coccidiosis was reported and treatment was outlined.

Acting under the authority conferred by appointment as veterinary and milk inspector, eight dairy herds were tested for T.B. and one of these was re-tested where a reactor was found. Four dairies have been under inspection.

Six outbreaks of hæmorrhagic septicæmia were reported and five investigated. In only one case were the losses heavy; stock shipped in from the Coast and Prairie stockyards and trailed three days in cold weather. Three outbreaks were in calves weaned just as the cold weather set in. One was in September amongst paid fed calves and another in August where cows nursing calves had a light attack. Only in the latter case had preventive vaccination been performed. Prevention by vaccination and elimination as far as possible of predisposing causes are advocated. Diarrhetic conditions in cattle have been investigated and in only one was coccidiosis present. Changes of the feed cleared up others. In two herds bloat caused some losses. Outlined prevention and treatment stopped any further ones.

Infections caused by Actinomyces necrophorus have been seen. Infection in a trail herd resulted in severe lameness and caused much concern until it was diagnosed. Blackleg infection is not widespread and in only one area does it exist; vaccination has prevented losses. No cases of Cassuis lymphadenitis were reported in either deer or sheep. No cases of Encephalomyelitis in horses are known to have occurred. Cases of suspected poisoning have been investigated. Skeletal abnormalities in horses seem common, also teeth troubles. It is thought that the overcoming of possible mineral deficiencies in colts may help eliminate these.

Advice has been given on the handling of many other more minor conditions. No attempt has been made to give a complete veterinary service. Trips are not made to treat individual animals and surgery is not done. Cases requiring surgical interference are reported to a private practitioner who makes periodic trips through the district. Most stockmen realize that, due to the distances involved, complete veterinary service cannot reasonably be expected from Government agency or private practitioner; there is, therefore, a keen interest shown in acquiring all possible knowledge of diagnoses and first-aid treatment of animal ailments.

Yields of hay were not as heavy as in the previous year but the weather for haymaking was more favourable. There was quite a large carry-over of hay of 1939 and supplies seem ample for feeding needs this winter. With alfalfa, very little winter-killing was expected.

Potatoes yielded a little better than an average crop, some car-loads of certified seed have already been shipped out.

Yields of grain were very satisfactory, weather conditions for harvesting and threshing were also satisfactory.

Corn experiments as carried out last year by G. A. Luyat were extended by him this year when he had several varieties planted on three ranches in the Soda Creek area for variety yield and maturity tests. Following his procedure these were harvested and data compiled. Seed was supplied by Dr. S. Clarke, of the Experimental Farms Branch, Swift Current, and he also conducted the dry-weight determinations.

The annual meeting of the South Riske Creek Grasshopper-control Area was held on November 8th. There were no activities or expenditures to report because of the absence of infestation in this controlled area.

The annual meeting of the Clinton Grasshopper-control Area was held on November 13th. Some infestation occurred but it was not extensive; $224.50 was spent in control-work. No supplies were bought, those on hand proving more than ample. The committee have on order a mechanical spreader. With this machine baiting can be more efficiently and quickly carried out and the saving effected in the amount of bait used should soon pay for the machine.

Two Rural Occupational Schools were conducted in the district by a staff from the University Department of Extension. The school at Forest Grove, with excellent local support, started well but unfortunately an outbreak of " flu " caused an early closing. The second school at Kersley was a very successful affair.

PRINCE GEORGE AND NECHAKO.

JAMES TRAVIS, DISTRICT AGRICULTURIST.

January and February contributed their usual quota of snow and frost with below zero temperatures. March opened with slight thaws interspersed with rain, wind, and frosts. A cool April, accompanied by night frosts, delayed spring opening with seeding extending well into the month of June. The latter month was cooler and drier than normal but the May carry-over of moisture sufficed for growing crops, although hay and other crops were retarded on some sandy loams and dry bench lands. The crop situation in many districts,

particularly west of Prince George, was immensely improved when July's rainfall totalled 4.59 inches, the second wettest in the past twenty-six years.

The 1940 alsike-seed crop throughout the Prince George and Vanderhoof areas was adversely affected by winter-killing, due to lack of sufficient snow protection coupled with June drought. Consequently, yields and quality suffered. Fortunately the month of September was favourable for threshing off the ground with the minimum of loss.

The alsike-seed producing areas include the districts of Pineview, Woodpecker, Salmon Valley, and Vanderhoof. A seed-crop of approximately 72 tons alsike and 26 tons alsike and timothy mixture is recorded, compared to a total of 69 tons alsike and 20 tons alsike and timothy mixture in 1939 from the same area.

Prices of this commodity are slightly higher than last year, when growers received 12 cents per pound for No. 1 grade. It is estimated that by the end of December 90 per cent. of the total crop will have reached the Coast markets. Prices paid to growers f.o.b. Vancouver during December were as follows: Grade No. 1 alsike, 15 to 16 cents per pound; alsike and timothy mixture, 10½ cents per pound; timothy and alsike, 6¾ cents per pound.

There has been a brisk demand on the part of the wholesale trade for the British Columbia crop; a contributing factor being the situation in Ontario where the 1940 crop was one of the poorest in many years, both in quantity and quality. Statistics on this latter Province indicate that the ten-year average yield is about 3,000,000 lb.; this year it is estimated at 924,000 lb.

Throughout the whole district generally potato yields are reported as having turned out higher than the average. A surplus total of from 150 to 200 tons will be available for local and near outside markets. East of Prince George producers along the C.N.R. have been investigating coastal freight rates on car-load lots, but it is pointed out that large supplies are available from points located within a short distance from Prince Rupert.

Yields of hay are reported below normal for the current year. The 1939 surplus was absorbed during the early part of this season, and there is at present a sufficiency of mixed hay on hand, supplemented with sheaf oats. The quality of the present crop is poor, lack of sufficient moisture during the month of June being largely responsible.

There are ample supplies of both feed and seed-grain of oats, wheat, and barley. At Vanderhoof a pronounced surplus of 1940 threshed oats, together with a substantial carry-over from last year, has created a critical situation which threatens to disrupt orderly marketing and future production. Local storage facilities will be taxed to the utmost, while farmers will be called upon to sacrifice part of the crop at present low prices in order to meet operating and living expenses.

Prince George and adjacent areas have consistently remained interested in growing fall or winter wheat. Crail Fife and Dawson's Golden Chaff have proved quite hardy, yielding equally as well as such varieties of spring wheat as Reward and Garnet. Experiments with Kharkov in 1937 were followed by substantial plantings of this variety, which is preferred on account of hardiness, quality, and yield of grain. One grower at Vanderhoof threshed 59 bushels per acre, and Woodpecker growers have harvested yields of 40 to 50 bushels of this variety.

As a result of investigation carried on since 1936 regarding the practicability of successfully growing commercial peas, substantial trial plantings were undertaken throughout the Vanderhoof area during the current season. Despite the fact that this crop was subjected to drought, frost, weed competition, and delayed rains, the growers harvested and threshed approximately half a crop. At one time a total crop failure was predicted. Under the circumstances, the prospect of establishing this industry throughout the above district is encouraging. The whole farming and business community has been observing this new venture with keen interest.

Some 80 acres, divided among eight growers, were planted to the following varieties of commercial peas: Alaska, Bluebell, Dashaway, Idabell, Green Wrinkled, Okagreen, and Large Yellow. The more promising for the locality appear to be Idabell, Okagreen, and Green Wrinkled, but it will require another and nearer normal season to determine which varieties are most suitable and profitable.

Approximately 30 tons are stored in the local elevator, much of which will be retained for local spring seeding next year. All 1940 contracts with wholesalers were arranged on a basis of $40 per ton, plus probable bonus for all varieties.

All the original growers have expressed their intention to continue with the crop during 1941 at increased acreage, and there is every prospect of applicants in plenty for contracts.

Owners of threshing-machines furnish information each year denoting the quantity of grain, grass-seed, clover, etc., threshed by each machine. The tabulated returns are shown opposite the individual names listed on a separate form accompanying this annual report. A summary of the present and preceding year denotes:—

	1939.	1940.
Spring wheat (bu.)	17,292	22,703
Winter wheat (bu.)	3,926	8,591
Oats (bu.)	167,285	169,884
Barley (bu.)	7,649	15,609
Peas (bu.)	163	286
Rye (bu.)	761	556
Alfalfa (lb.)	.....	200
Alsike (lb.)	138,789	143,493
Alsike and timothy (lb.)	61,000	51,818
Red clover (lb.)	1,000	600
Sweet clover (lb.)	500	.....
Brome (lb.)	200	.....
Flax (bu.)	.....	17½
Mixed grain (lb.)	.....	49,000

Under the Federal-Provincial Seed Improvement Plan, whereby certain districts are being encouraged to test clovers and grasses for seed production on prearranged terms, the following allotments were made, seed being provided by the Federal Department of Agriculture: Parkland Brome Grass—C. Prout, Vanderhoof, 40 lb.; P. Robinson, Fort St. James, 45 lb. Red Clover and Brome Grass—Trials during season 1939, 40.

Under the above system four growers at Vanderhoof conducted tests with Red Clover, three of whom have recorded failure due to winter-killing.

The remaining grower reports approximately 75 per cent. winter-killed. Surviving plants did not produce sufficient seed to merit harvesting.

Parkland Brome Grass, one grower only. Crop failed to winter through.

The Dominion Plant Products Division provides inspection for seed registration and certification. During the past season the following crops were visited by official inspectors of this Branch:—Certification: Legacy Oats, R. Blackburn, Prince George, 16 acres. Registration: Victory Oats, R. L. Head & Sons, Red Rock, 8 acres.

The influence of the British Columbia Field Crop Union continues to expand throughout this territory. A wide range of valuable and diversified experiments is undertaken by its members. Included in this year's trials are plantings of flax, rye, field peas, buckwheat, clovers, and potatoes.

Wild Rice.—From trials conducted during the period 1939–40 from seed supplied by the Department of Agriculture, Victoria (source, Lac Du Bois, Manitoba), it was noted that one trial out of three was successful, in that plants grew vigorously although failing to produce mature seed. There is local evidence that this plant, given the proper environment, can be successfully established throughout this territory.

The Central British Columbia Seed Fair was held this year at Prince George on November 22nd. An extra class was added to the prize-list to admit entries of certified seed potatoes shown by members of Boys' and Girls' Potato Clubs.

Co-operation in helping to control outbreaks of noxious weeds on the C.N.R. right-of-way and public highways serving this district was not lacking during the past season. The Superintendent of the C.N.R., Prince Rupert, and Public Works Engineers at Prince George and Quesnel were prompt to take the necessary action whereby control could be effected. Outbreaks of thistle on tracks near the steel bridge at Prince George and in the vicinity of Newlands received attention, while roadside weeds on the highway from Quesnel north and around South Fort George were cut down.

A communication describing weed-control suggestions forwarded to district Public Works Engineers from the Provincial Field Crops Commissioner was of material assistance in focusing attention on the weed problem during the growing period.

As reported during 1939, certain farmers were supplied with small quantities of Atlacide for experimental treatment of couch grass to be administered during the month of October.

The experimenters, H. Goldie and C. Smedley, of Vanderhoof; E. O. Hutchinson, of Woodpecker; and J. Aitchison, of Prince George, all report a satisfactory killing when fields were inspected the following spring. The rate of application advised was 180 lb. per acre. Dry method was practised, the chemical being mixed with twice the quantity of sand.

During the summer months individual and public weed-spraying demonstrations are given whenever opportunity offers. Several Farmers' Institutes were reported to have purchased bulk quantities of Atlacide to fill orders filed with secretaries, while several small quantities of this material have been placed with selected individuals for experimental purposes from office stock on hand.

Over a period of four years twenty-two growers have been selected to carry on experimental plantings of apple-trees with varieties supplied under the direction of the Provincial Horticulturist. To date this project has been fairly successful, the majority of the trees having weathered the climate and continued to make growth. This year an early June frost caught most of the blossom. For the first time selections of hardy pears and plums were included, the trees being supplied by the Central Experimental Farm, Ottawa. District zoning for the current year of 136 apple, pear, and plum trees is tabulated as follows:—

Apple varieties from Experimental Farm, Summerland: Beauty, Columbia, Haralson, Hibernal, Martha, Ohana, Olga, Pioneer, Robin, Sheriff, Transcendent, and Virginia. Number of growers: Dunster, 2; Fort Fraser, 1; Hixon, 3; Longworth, 1; Mud River, 1; Prince George, 2; and Salmon Valley, 1.

Apple varieties from Central Experimental Farm, Ottawa: Lobo, Joyce, and Patricia. Number of growers: Strathnaver, 1; and Vanderhoof, 4.

Pear varieties from Central Experimental Farm, Ottawa: Enie, Menie, Miney, Moe, and Phileson. Number of growers: Strathnaver, 1; Vanderhoof, 2; and Woodpecker, 2.

Plum varieties from Central Experimental Farm, Ottawa: Grenville, Leeds, Kahnita, and Underwood. Number of growers: Salmon Valley, 1; Strathnaver, 1; Vanderhoof, 2; and Woodpecker, 2.

The iris and dahlia roots donated in past years by Robert Murray, of Victoria, and distributed throughout the district from this office, continue to give much pleasure to flower-lovers on an expanding scale, due to natural increase of roots and tubers. The Department of Agriculture has also furnished trial lots of bulbs and seeds for the same purpose and these supplies have been welcomed by recipients.

The Prince George Horticultural Society continues to function along progressive lines. Its chief functions are home and city beautification, tree planting on boulevards, and city garden competitions. The annual Flower Show has now reached its seventh successful year. In all of these activities this office contributes material help.

The Provincial demonstration hive entered its second year under the supervision of Walter R. Head, Red Rock, located close to the main Quesnel Highway. On December 9th, 1940, Mr. Head reported as follows:—

"The bees in this hive wintered well and when examined in the spring were still well supplied with honey, and no sugar was fed. The bees were active all through the summer months and gathered most of the honey produced while the clover was in bloom. No swarming occurred and no queen-cells were produced. The later honey-flow was rather light. The bees were left with about 40 lb. honey for winter feeding and about 15 or 20 lb. of surplus honey was taken from the hive. No sugar was fed in the fall."

In co-operation with J. H. Cooper, apiarist, Salmon Valley, this office acted as a clearing-house for spring shipments of package bees arriving for clients throughout the district. With one or two exceptions hives are being established on farms whose owners include clover-seed growing as part of the crop-rotation; fertilization being the chief object. A steady increase each year in the number of farmers employing one or two hives for this purpose is noted.

With spring opening there was the usual active demand for agricultural teams and only a limited supply procurable. At the approach of fall with its increasing demands on farm power, it seemed significant that several light tractors of the newer models sold readily.

The Belgian stallion " Farceur Boy " again served the Pineview and McBride Districts, and it is expected that a registered Percheron, raised locally, will come into service next year. Another registered Percheron stallion, " Prince Le Roy," was added to the Pineview District in December.

Farmers who have been in the habit of feeding and fitting beef cattle for outside markets, although few in number, continue to stay in the business. There is a growing tendency to dispense with mixed grades; consequently, a few more pure-bred bulls, particularly Herefords, are making their appearance.

With regard to dairy breeds, recent improvements in prices for dairy products are helping to build up quality herds. In this connection the influence of the Ayrshire herd of the local Dominion Experimental Farm, now established, will be noticeable.

An increase in the number of marketable hogs throughout the Prince George-Vanderhoof Districts in the beginning of December can be credited to an endeavour on the part of the farmer to consider greater production of bacon as outlined last year under the National Bacon Hog Policy.

The resulting surplus over local market requirements must be shipped out and steps are now being taken under the direction of the several Farmers' Institutes to organize pool shipments to Coast markets in car-load lots.

Apart from minor coughs and colds contracted during shipment, no serious complaints in connection with sows procured under the above mentioned policy reached this office. Farmers on the whole were generally satisfied with their purchases.

Throughout the eastern districts the campaign directed toward extermination of gophers has now been in operation for four years. Assistance in securing early season supplies of Cyanogas has been rendered by the Department of Agriculture to the districts of Longworth, McBride, Dunster, and Croydon.

The rodents are being held in check on cultivated lands, but bush lands and unoccupied areas continue to harbour and protect these pests.

Thanks to the very thorough precautionary measures adopted by the farmers last year at the suggestion of the Provincial Department of Agriculture, Victoria, there was no hitch in the proceedings when treatment was administered this year for sleeping sickness of horses during the early part of May. Experienced committee-men arrived at the several appointed centres and these volunteers proceeded with the work of vaccination, this process being repeated a second time after the necessary interval. Approximately 180 head were treated at these centres. No local outbreaks of this disease have been reported to date.

Warble-fly Control.

Pineview District.—Throughout the organized district described as the Pineview warble-fly control area, volunteer working committees are annually appointed for the established zones under the direction of the Prince George Farmers' Institute. For the past five years three treatments have been administered annually. Some doubt is now being expressed as to the necessity of continuing the work, many farmers claiming that the cattle of this area are warble free and that it should only be necessary to inspect stock which may enter the district from outside points in future.

Woodpecker-Hixon-Strathnaver District.—Plans were formulated last spring to extend control measures farther south along the same lines as the foregoing. On request, a small quantity of material was furnished to the Institutes while several volunteer workers were supplied with the necessary report forms. It will require another season to properly introduce this system and define the area in question.

Tabulated forms detailing number of cattle treated and other particulars are forwarded to the Provincial Live Stock Commissioner's office each year.

Boys' and Girls' Clubs and Projects.

Owing to the war and other unfortunate circumstances, club-work during the season received a setback in some districts. On the other hand, an additional Dairy Calf Club was organized when plans were formulated for the division of Pineview District, whereby a club

was formed in each of the school districts known as "Thompson" and "Tabor," situate within the Pineview area. The following centres were responsible for clubs as recorded:—

Name of Club.	Kind of Project.	Organizer.
Thompson	Dairy Calf	R. Blackburn.
Tabor	Dairy Calf	S. Zingle.
Longworth	Dairy Calf	W. A. Riggs.
Hixon-Woodpecker	Beef Calf	C. Batten.
Reid Lake	Calf (non-regulation)	W. Roberts.
Pineview	Poultry	E. Wilson and J. Cameron.
McBride	Poultry	S. N. Knowles.
Thompson and Tabor	School garden competition	Cariboo W.I.
South Fort George	School garden competition	P.T.A.

Field-days within the district and conducted by R. Hall, Supervisor of B.C. Illustration Stations, were held at the stations located at Salmon Valley, July 9th; Strathnaver, July 11th; and McBride, July 6th.

Two ploughing-matches were featured at mid-season. These events were staged at Woodpecker and Strathnaver respectively on May 29th and June 8th.

The annual convention of District "C" Farmers' Institute was held at McBride and extended over the week-end period July 6th to 8th. Hon. K. C. MacDonald, Minister of Agriculture, and the Deputy Minister journeyed to McBride and were afforded an opportunity of inspecting the agricultural area of McBride and surrounding district. During the visit of delegates and visitors to the Oakley Illustration Station the Minister delivered an instructive and inspiring address on co-operation, marketing, and other subjects of interest. Special significance was attached to this conference on account of 1940 being the 25th anniversary of the McBride Farmers' Institute. Representatives of the Provincial and Federal Governments, local Boards of Trade, Chambers of Commerce, and other associations attended.

Aid given under the Settlers' Assistance Agreement in the Fort George District has been considerably less for the fiscal year 1939–40. As at April 1st, 1940, there were nineteen active cases out of which total only eight are receiving assistance at the present time. Of the eleven cases where aid has been discontinued, six have been deemed to be now in a self-supporting position, three enlisted in the Canadian forces, one died, and one case was dropped from the list for the reason that it appeared hopeless to continue.

The Omineca District was split and only east of Endako was administered from the Fort George Relief Office since the beginning of the fiscal year. There is only one case in this part of Omineca receiving assistance under the scheme and he is expected to be on a self-supporting basis by spring.

Generally speaking, the success of this scheme has only been mediocre. About 50 per cent. of those assisted have been brought to a self-supporting position. Improved conditions generally have aided in bringing about this result. Crops have been good this year and prices for farm produce have been slightly higher.

During the past season there has been comparatively little settlement in this area. The greater number have located west of Endako. The local District Superintendent, C.N.R. Department of Agriculture and Colonization, reports six purchases involving 898 acres and four leases involving 2,023 acres, while the Government offices at Prince George advise that forty-four applications to purchase and thirty-two pre-emption records were allowed during the year 1940.

The Dominion Experimental Station, for which land near Prince George was acquired last year, is now beginning to function, with Superintendent R. G. Newton and staff on hand. Construction of buildings has been in progress for some time. The main dairy and horse barns are nearing completion.

Under the direction of the Department of University Extension, Rural Occupational Schools were established at the following centres: McBride, November 18th to December 2nd; Woodpecker, December 3rd to December 23rd.

McBride District was successful in securing the necessary twenty-five approved students while Woodpecker enrolment was slightly in excess of the required number. Students from Mud River, Beaverley, and Pineview contributed to the latter quota. Some assistance was rendered from this district office with these organizations.

SKEENA AND BULKLEY VALLEYS.

S. G. PRESTON, M.S.A., DISTRICT AGRICULTURIST.

Despite adverse growing conditions during May and June, the crops this season have been well up to average with the exception of timothy-seed. Pasture was quite fair all season and the excellent fall weather made possible the threshing of grain and other seeds in good condition. Thus, considering the excellent quality of threshed products, a strengthening in the price of timothy-seed and beef cattle and an increase in the sales of butter-fat, the cash returns to the district will only be about 10 per cent. under 1939 and slightly better than any other season for the past five years.

The months of April, May, and June were cool, with dry winds and practically no rain. By the end of June most crops were suffering from lack of rain as well as being retarded by cool weather. Cutworms, too, did a good deal of damage to crops, but more particularly to gardens. The weather changed abruptly the last week in June and the following two months gave the district the best growing weather experienced in years. As a consequence all grain-crops came ahead, gardens were normal in a short time and even those which had been reseeded after the cutworm depredations matured early. The timothy had gone too far for a complete " come back," so part of the normal seed-crop was cut for hay for winter feed. The threshers' returns show the timothy-seed yield about 57 per cent. of the average of the previous four years.

The following table shows the distribution of moisture for the growing season of 1940 and comparisons with 1938 and 1939 (courtesy Dominion Experimental Sub-station, Smithers, B.C.) :

Month.	1940.	1939.	1938.
April	0.75	0.67	0.42
May	0.45	1.73	.....
June	0.63	1.30	0.46
July	1.72	2.17	0.18
August	1.61	0.35	.....
September	0.36	0.79	0.76
October	1.76	2.43	.....
Totals	7.28	9.44	1.82

With the exception of timothy-seed and possibly hay, the cereal production is higher than the average of 1936 to 1939. The potato-crop also was particularly good and the quality above average. It is to be expected, however, that some of the increased yield of grains and vegetables is due to an increased acreage in crops. The Swiss and Holland settlers have been active in getting new land under cultivation.

CROP YIELDS.

(Threshers' returns, 1936–40. Percentages given only on significant yields.)

Crop.	1940.	4-year Average, 1936–39.	Percentage, 1940 Crop of Average 1936–39.
Spring wheat (bu.)	20,144	14,008 }	131.00
Fall wheat (bu.)	900	2,029 }	
Oats (bu.)	78,000	69,900	111.00
Barley (bu.)	17,027	11,800	144.00
Rye (bu.)	84	130	.....
Peas (bu.)	17	423	.....
Timothy-seed (lb.)	675,130	1,184,862	0.57
Alsike clover (lb.)	5,000	24,255*	.....
Red clover (lb.)	500	.....	.....
Alfalfa (lb.)	2,000	.....	.....
Crested wheat-grass	No record	1,000†	.....
Meadow fescue (lb.)	No record	1,450‡	.....
Creeping red fescue (lb.)	No record	.....	.....
Brome-grass (lb.)	900	2,635‡	.....

* 1939. † Two years' average. ‡ Three years' average.

The most significant figures are those for wheat, oats, and particularly barley. There is practically no market for these grains outside, but with the creamery in operation at Telkwa more cows are being fed for winter production of milk and the past two years have shown a large increase in the production of hogs. This means that most of the grain is being marketed in the way of live stock or milk products.

In 1939 approximately 80 tons of alsike and alsike-timothy mixtures were marketed. The dry spring weather reduced the yield of alsike clover so there will not be as much of that commodity this year. The quality of alsike produced is very good, however, and should grade No. 1 or No. 1 mixture.

Red clover is a crop which is becoming more popular now it is realized it can be grown satisfactorily in Central British Columbia. So far the local demand has taken care of the district's production.

This is the first season there has been an appreciable production of alfalfa-seed. The season, however, was more favourable than usual for the setting of seed and it is not to be expected that this is a crop which can be depended upon, at least for some time.

A number of Field Crop Union tests were again under trial in this district. These tests are much appreciated by the farmers who take advantage of them. It appears, however, that more advantage would be derived from the tests if it were possible for the district officials to give direct supervision or more attention to the manner in which the tests were carried out. We are pleased to note that Crested wheat-grass and alfalfa have found a place on some of the farms through these tests, fall wheat has been found to grow satisfactorily, Olli barley has become a popular crop, and it has been possible to try out early varieties of oats, make legume tests, and conduct limited fertilizer trials.

In addition, the Department has made available varieties of fertilizers for a series of tests and a new selection of potatoes. In addition, in co-operation with the Dominion Department of Agriculture, tests with Parkland brome-grass, spring rye, and creeping red fescue were made available.

Three series of fertilizer tests were started at Kitwanga, Telkwa, and Wistaria. It is expected one or more of these will be continued over at least a five-year period to determine the effect on following crops, with the aim to establishing a definite crop-rotation and fertilizing for the most economical results. Commercial fertilizers are not used in this district to any extent outside of Terrace, so it was interesting to note a trebling in the yield of oats at Kitwanga and a doubling of the yield of potatoes at Telkwa from some of the applications. The early part of the season was particularly dry, so the actual benefit of the 1940 applications was noticeable only in a few cases and the recipients were advised in some cases to hold part of the supply over until next season as it was felt the nitrogeneous fertilizers would be wasted when there was not sufficient moisture to utilize it.

Two plots of Thompson's Netted Gem potatoes were inspected. The season was more favourable than usual for potatoes so further tests will be necessary to determine the adaptability of this strain to Central British Columbia. It is certain, however, that the variety flourished under adverse moisture conditions better than some of the commonly grown varieties.

Very little information is available on the Parkland brome-grass. A series of mishaps have attended the growing of this grass in the past two years, of which cutworms and dry spring conditions gave the most trouble. Five acres of Parkland brome in the Round Lake area, seeded in 1939, were cut for hay this season and is expected to make a seed-crop in 1941.

Following demonstrations through the district on the use of chemicals for the control of weeds, the Quick Farmers' Institute has secured a spray-pump and a supply of chemical for use by its members. A few farmers in other areas have secured their own equipment and are getting rid of some of the troublesome perennial weeds on their own farms. Most of the work has been done on Canada thistle, ox-eye daisy, and couch grass. Results have shown that the most effectual kill on Canada thistle and ox-eye daisy was obtained in the early blossom stage. With couch grass the late fall spray has given very encouraging results.

We feel that most of the farmers are genuinely interested in keeping their farms free of weeds and by continuing to keep up this interest that there will not be any great increase in the noxious weeds. The roadsides and railway right-of-way present a problem. The Public Works Department, however, has been anxious to help keep down noxious weeds and

last fall a gang was allotted to destroy the ox-eye daisy stands in the Evelyn and Smithers District.

The cutworms were the greatest factor in cutting down the yield of garden produce this season. With the dry and cold spring weather it was not felt worth while to reseed in many cases. However, those who did reseed where damage was done were rewarded with excellent yields of beets, carrots, parsnips, turnips, cabbage, and cauliflowers. Potatoes were not attacked by cutworms and the yield and quality of potatoes was the best it has been for a number of years.

The frosts in October caught some of the vegetables but the percentage affected is not very great. There will be plenty of carrots, turnips, and cabbage for local consumption and about ten car-loads of potatoes for sale outside. This is in addition to approximately six car-loads which have been shipped to Prince Rupert to date.

The varieties of potatoes giving the best returns with quality are Gold Coin and Columbia Russet. Others such as Netted Gem, Beauty of Hebron, and the early varieties have limited use for certain types of soil or early use.

Small fruits is a branch of farming which remains pretty well unchanged. The needs of the district are supplied by the lower Skeena and small plots on many of the farms, but there is practically no sale outside. The Terrace District could produce an abundant supply of raspberries and strawberries, but a lead in growing and marketing would need to be established as many sales in the past have been lost through careless packing or use of unmarketable varieties.

Of the raspberries, nearly any variety will produce satisfactorily under suitable conditions throughout the district. The Cuthbert gives the best fruit, but much of the stock is becoming badly diseased. Especially this season were a number of diseased plots noted. Advice was given on cleaning out and procuring new stock. Other varieties noted appear to be Latham and Lloyd George, as well as many that cannot be identified.

Strawberry varieties include Magoon, Senator, Dunlap, Royal Sovereign, Saanich Queen, and the so-called Skeena Wonder. The Magoon ordinarily appears to be the best type of strawberry in the Terrace District and Bulkley Valley but is subject some years to frost-injury, imperfect fertilization, and off-shape berries. In the Bulkley Valley, Senator, Dunlap, and Saanich Queen are giving good results. A number of varieties of unknown origin have been noted in the Lakes District which are suitable for local use. Where there is difficulty with spring frosts the " ever-bearing " appear the best type. Many types have been named the " Skeena Wonder " but these are usually red only on the outside and present a very poor appearance when cooked. Considerable test work and observation would be necessary before definite varieties could be recommended for a district.

The tree-fruits at Terrace gave a fair yield this season. In 1939 the quality of apples was poor but this season it was fair again, the McIntosh Reds, Wealthy, and Duchess giving the best quality. The cherry-crop was light, apparently affected by an early spring frost. Plums were good quality but very few trees are grown. It was noted that where systematic pruning and spraying was done the quality was good and the growers were able to dispose of their produce satisfactorily. When the car-road is completed to Terrace there should be an increased demand for fruit from that district and it is felt by the farmers that the present is a good time to start improving their methods of handling fruit-trees. Possibly some demonstrations on pruning and spraying in that district in the near future would be of advantage.

For the past few years a number of fruit-trees of hardy stock have been sent in to the Bulkley Valley and Lakes District for test. The most satisfactory trees were the 2-year-old ones. The older trees did not become established as easily. Most of the older stock was produced at the Experimental Farm, Ottawa, while the younger trees came from Morden, Manitoba. A few of the 1936 plantings of crab-apples have produced fruit at Hazelton. It was expected one Telkwa planting would have fruit this spring but a late frost killed the blossoms.

These trees have been tested chiefly for soil-type and slope to date. There is little trouble with winter-killing but a number have been lost through injury and girdling by mice. Many of the trees from Ottawa were too long in transit and failed to take.

With the production of flowers we have had some very welcome gifts of bulbs, tubers, and seed. Since 1936 a considerable number of iris, gladiolus, tulip, daffodil, hen and chickens,

and various types of flower-seeds have been distributed on farms where they would be appreciated. It was gratifying to observe some very fine blooms this year of iris, tulips, daffodils, gladiolus, and a few dahlias.

The production of live stock in the Bulkley Valley and Lakes District has shown a slight increase in the past two years. Contributing to this increase is the establishment of a creamery at Telkwa, a better price for beef, mutton, and wool, and the encouragement by the Government to grow more swine. A further factor is the lack of markets for locally grown grain. The farmers are finding it pays better to market this grain through feeding it to live stock.

The following figures show cattle shipments from this district for the period January 1st, 1940, to December 5th, 1940. (Figures supplied by C.N.R. Freight and Passenger Agent and Provincial Police, Burns Lake.)

Car-load Shipments or Equivalent from	Vancouver and New Westminster.		Prince Rupert.	Terrace.
	Cattle.	Hogs.	Cattle.	Cattle.
Endako	3	----	1	----
Burns Lake	22	3	9	----
Houston	1	----	----	----
Forestdale	1	----	----	----
Topley	1	----	----	----
Knockholt	1	----	----	----
Quick	1	----	----	----
Telkwa	8	1	4	----
Barrett	----	----	1	----
Smithers	----	----	1	1
New Hazelton	----	----	1	----
Kitwanga	----	----	1	----
Totals	38	4	18	1

Besides the car-lot shipments of hogs shown are a few sent in mixed cars. The total number of hogs and sheep included in the table are: Hogs, 393; sheep, 167.

The buyers feel there is a better grade of beef animals throughout the district than a few years ago. This fact, together with a tendency on the part of the ranchers to fit the animals for market brings the average up. Improvements in breeding and care of beef animals could be done, however, and to this end work with the Junior Beef Clubs in the Francois Lake area is having some effect.

The Hereford is the popular beef breed. It is hardy, good bulls are obtainable more readily than with Shorthorn or Angus, and the first cross with other breeds or scrub stock gives a uniform appearing herd. One farmer with a good grade herd of Red Polls found he had sufficient cows and heifers for his milk requirements for a number of years. A Hereford bull was introduced in place of the Red Poll. The first shipment of the cross-bred animals went out this fall and was one of the finest car-loads of beef animals ever shipped from the district.

Whole-milk shipments to Prince Rupert were up this season. This is a limited trade, however, but it has meant the development of a few good herds from which other dairymen can obtain better than average breeding stock. The Interior Creameries report a substantial increase in butter-fat purchases this season. The price of butter-fat was quite low during the summer but the spring and fall prices have been fair. Thus it is expected that many farmers will feed for butter-fat production during the winter that would otherwise let the cows dry up if the price had remained low.

The Cow-testing Association was resumed in May after a lapse of seven months. No significant figures on the season's production will be available, however, until a year's records have been obtained. The spring and summer production for the Association has, however, been considerably above that of previous years.

Despite uncertainties among the farmers as to the possibility of marketing an increased number of hogs the surplus has been almost cleared out. This is the first season that car-load shipments have been sent from the district and in all 393 hogs have found their way to the

Vancouver and Prince Rupert markets. The price has not been encouraging but at the same time is a good return at 7 cents net, live weight, for the feed consumed. Even on a lot of fifty-five hogs from Telkwa shipped as a car-load to Vancouver, with six more added at McBride, the net price was 7 cents, live weight. Quite a number of hogs both from the Francois Lake District and Telkwa graded select. This shows that a select type hog can be produced in Central British Columbia with local feeds.

The buyers report that they are able to sell Yorkshire bacon, feeder or block hogs, satisfactorily in Vancouver but have trouble disposing of the Berkshire, which more often goes as a block hog than bacon type. There are very few Berkshires, however, in the district and this fact may lead to a specialization in the Yorkshire bacon hog. The class of Yorkshire is better than would be expected for an unorganized district, so it has been comparatively easy to quickly build up a supply of good grade market types.

Raising of sheep has not become important as yet. Shipping figures do not indicate much change from previous years. If the raising of sheep, however, appears to be sound there will be a considerable farm business built up with these animals. The increase, however, will be slow as it is a job that requires a knowledge of handling.

The quality and production of poultry and eggs has shown a slow but steady increase the past few years. The primary factor inducing this increase is a steadier and higher average price for both dressed poultry and eggs. In one district the Junior Poultry Clubs gave the raising of poultry an impetus that has now become a well-established part of the business on several farms. The Experimental Sub-station at Smithers has made available first-class cockerels and, added to this, the reasonable price and safe transportation of day-old chicks has added a great deal to the introduction of good stock.

The storekeepers have repeatedly mentioned that the farmers who pay their bills at the stores are those who keep poultry and milk cows. This is not because their gross income may be larger than the one who depends on a single crop but the person who depends on a definite monthly income is more likely to confine his expenditures to that amount.

The raising of turkeys, ducks, and geese has changed very little. There is a slight increase in the number of turkeys this year and those who have a sizeable flock are realizing a good return at the present price of 27 cents dressed.

Recently a number of farmers have brought up the subject of having some one visit the district to speak on feeding, housing, and dressing of poultry. Extension-work of this nature has been carried out in the district in the past, but many feel that it should be repeated as there are a number of young people growing up, as well as new settlers, who have not had the opportunity to witness such demonstrations.

The season's production of crops appeared rather poor, with the timothy-seed production down, but considering the net returns from all farm products shipped to outside markets the outlook is much more cheerful. The following table is an estimate of the three main returns for the farmers of this district for 1938, 1939, and 1940. It is seen that the returns for this season are considerably above that of 1938 and not a great deal below 1939.

Item.	1938.	1939.	1940.
Timothy seed	$17,000	$92,000	$44,000
Live stock	60,000	45,000	73,000
Dairying	18,000	24,500	28,000
Totals	$95,000	$161,500	$145,000

In addition to these items there is an annual increase in the production of eggs and dressed poultry, which together with the stronger price in 1940 gives a definite increase in cash returns. The potato-crop also, if a market is found, will bring in about $8,000 more than any season in the past five years.

There does not appear to be any appreciable market for grain and the only way the surplus can be reduced is through feeding to live stock. This will probably be an advantage in the long run as the returns from sale of grain have not been a great deal in the past ten years.

The general price of farm commodities was similar to any other part of British Columbia, except where freight rates were a determining factor as listed.

Eggs: Basis, local demand or Prince Rupert price—low, 15 cents; high, 35 cents.

Beef cattle: Prince Rupert or Vancouver price less freight.

Swine: Basis, Edmonton or Vancouver live weight price.

Grain: Very little demand; prices paid, all grains $16 to $20 per ton (local).

Timothy seed: ¾ cents per lb. premium as a rule, basis No. 1, imported from U.S.; 1939 crop, 5½ to 6¾ cents per lb., f.o.b. shipping-point; 1940 crop, expected price, minimum, 7 cents net.

The extension-work in this district this season consisted in Junior Club work, advocating and advising in the production of hogs, and assisting in the groundwork toward the establishment of discussion clubs and to secure a closer co-operation between the farmers and the Department of Agriculture. Five boys' and girls' clubs were organized in this district during 1940. These were as follows:—

Name of Club.	Membership.	Organizer.
Bulkley Valley Dairy Calf Club	9	Ray Oulton, Smithers.
Round Lake Dairy Calf Club	7	Ray Annis, Smithers.
Uncha Valley Beef Calf Club	7	R. Wiley, Southbank.
Danskin Beef Calf Club	9	M. Anderson, Danskin.
Danskin Potato Club	11	M. Anderson, Danskin.

Last season it was noted that more co-operation of local organizations was necessary to obtain the fullest advantage of the boys' and girls' club-work. This season much of the organization and responsibility of four of the clubs was taken over by the Farmers' Institute of the immediate districts and the results were quite encouraging. Improvements are still needed, and of these the most urgent are a definite organization sponsoring the Round Lake Club and a more co-operative effort among members of the Uncha Valley Farmers' Institute to encourage the work in that area.

Two cups were donated this season for club competitions. The Royal Bank of Canada donated a cup for annual competition among the Dairy Calf Clubs of District "B," which was won this season by the Bulkley Valley Dairy Calf Club. The other cup was donated by the District "B" Farmers' Institute for Beef Calf Club competition and was won by the Danskin Beef Calf Club. The Dairy Clubs were judged by T. Paulsen, of the Interior Creameries, and K. McBean, of the Smithers Experimental Sub-station, on August 29th. The Beef Calf Clubs were judged by K. McBean on September 2nd.

The judges especially commended the members of the clubs on the excellent manner in which the majority of the calves were handled.

The Potato Club plots were inspected by the Dominion Certification Inspector, Norman Wright, and his assistance in scoring the plots was secured. Seven of the eleven plots passed field inspection and the final yields and quality were very good. Eight of the members exhibited their potatoes in a special class at the Central B.C. Seed Fair.

In his visit to the district in December, S. S. Phillips, Secretary of the B.C. Boys' and Girls' Clubs, spoke to meetings in the districts represented by the Junior Clubs. Mr. Phillips had excellent suggestions for carrying on the work and the members were much encouraged by his remarks. There has not been a team suitable to compete at the Provincial eliminations for a number of years, but it is possible a team will be eligible in 1941. It was particularly fortunate that Mr. Phillips was able to meet the possible contestants and discuss the nature and aims of these competitions.

Through a series of meetings during the early months of 1940 it was possible to discuss with farmers methods of handling and feeding live stock (particularly swine and poultry), care of dairy cattle, warble-control, boys' and girls' club work, activities of the U.B.C. Extension Department, and the organization of Discussion Clubs to study their immediate problems. The places particularly visited on these occasions were Driftwood (Smithers), Forestdale, Francois Lake, Danskin, and Uncha Valley. Appropriate films and film-slides were shown at the meetings with a general discussion following. The immediate results of these meetings have been a better understanding between the young people and the parents

and an improved attitude toward the Department of Agriculture. Definite assistance was given at Driftwood in creating an interest in the Discussion Club and it appears this club will go ahead on its own this year.

Two Rural Occupational Schools under the U.B.C. Extension Department were held this season, a two-week school at Terrace and a three-week session at Telkwa. The attendance was not as high as the previous years but this is explained by the enlistment or working-out of many of the potential members. The work continues to be of great advantage to such a rural district as this as it gives the young people a direct contact with the University and its work that can have nothing but a good effect on any who are able to assimilate the type of knowledge that will make them better farmers and better Canadians.

No Fall Fairs were held in this district, but your representative was asked to judge field crop exhibits at the Fort Fraser, Prince George, and Woodpecker Fairs. The quality of exhibits was particularly good in most cases, but the number of exhibits is hardly representative of the districts concerned. The Prince George Fair was held in the new arena which is far superior to the old rink for this purpose.

The Central B.C. Seed Fair was held at Prince George on November 22nd. While the quality of exhibits at this show was superior to most of the local Seed Fairs in the past, the quantity was disappointing. Mr. Newton, Superintendent of the Prince George Experimental Station, acted as official judge and was an enthusiastic assistant in preparing the show.

PEACE RIVER BLOCK.

T. S. Crack, District Agriculturist.

The season was very good with plenty of moisture during the growing season and not a drop of rain or snow during the harvest and threshing period. All grains threshed out in good condition. The average yield for wheat was approximately 33 bushels per acre; for oats, 52 bushels; and barley, 37 bushels.

There will be plenty of seed-grain in the district for the coming spring with an abundance of feed for the present winter. The temperature so far this winter has only been down to about 30 below zero for a short time.

A very marked improvement in the quality and quantity is noticed this year in the swine production, owing, no doubt, to the Dominion-Provincial Brood Sow Policy and the placing of boars in districts where twenty or more sows were purchased. Twenty-three of these Swine Improvement groups were organized in this district and all sows were purchased locally, which saved approximately 500 sows of good breeding type being sent to Edmonton for slaughter. This policy has done good work in this district and the boars already here will be switched to other districts in the near future.

The following is a summary of the live stock shipped by the Dawson Creek Co-operative Shipping Association from January 1st to December 7th, 1940:—

Hogs, 8,291; returns to farmers	$139,813
Cattle, 1,271; returns to farmers	53,870
Sheep and lambs, 508; returns to farmers	2,919
Total	$196,602
Estimate of shipments from private buyers:—	
Hogs, 1,540; returns to farmers	$22,300
Cattle, 1,077; returns to farmers	42,800
Sheep and lambs, 150; returns to farmers	850
Total	$65,950
Total for all shipments from Dawson Creek:—	
Hogs, 9,831; receipts	$162,113
Cattle, 2,348; receipts	93,670
Lambs and sheep, 658; receipts	3,769
Total	$259,552

This represents an increase of $81,552 over 1939.

A tendency to increase the raising of sheep in this district is very noticeable since the outbreak of the war. Some 4,000 sheep are now in the district and a lot of inquiries coming in for further supplies. The Dominion Ram Club Policy is doing much to improve the quality.

Cattle in the district are continuing to improve in quality, farmers taking more interest in the obtaining of pure-bred bulls. Dr. A. Knight, Chief Veterinary Inspector for the Province, visited this district during the month of August and visited 210 premises and tested 1,107 head of cattle for T.B. and only found two reactors. These two had recently been brought into the district from Alberta, which makes a very good showing for the district.

The same districts were treated for warble-fly control as 1939. A large decrease in the number of warbles found since starting the treatment three years ago. In every case where the most warbles were found were in cattle brought in from districts where there is no control.

A total of 1,836,503 bushels of grain was cleaned with the hand seed-cleaners purchased through the Federal-Provincial assistance for the various Institutes. These cleaners are continuing to do good work throughout the district.

The seed-drill survey was carried on again during the spring and the test-plots planted in the school-grounds in Dawson Creek along with registered and certified seed from the elevators.

A very successful flower-show was held in Dawson Creek on August 10th, under the auspices of the Horticultural Society, with a very good display of exhibits. This is going ahead very successfully and is the third show to be held in this district.

Garden competitions are increasing each year, starting with one in 1937 and this year was increased to fifteen. Competition this year was very keen and with the ideal weather conditions were very successful, resulting in a large number of good gardens.

The Kiskatinaw Fall Fair was held at Progress on August 21st. Although the indoor exhibits were not so many as in 1939 the quality was good with a very good showing of live stock.

A School Fair was held at Doe River on August 23rd with more exhibits than ever. An adult section was added to this Fair, also a Women's Institute section. Much interest is shown throughout the whole district north of Rolla in this fair.

An Agricultural and Seed Fair was held in Dawson Creek on October 26th, which was very successful, with 831 entries and $500.96 paid out in prizes. This fair takes in the whole of the British Columbia section of the Peace River District and is showing considerable improvement from year to year. There were some very fine exhibits of grain and it is hoped that on February 12th, 13th, 14th, and 15th there will be a seed display of samples of grains, grasses, and garden seeds for the purpose of those interested in purchasing and selling seed.

A very successful field-day was held at Beaverlodge on July 20th with approximately 300 visitors. No field days could be held in the block this year owing to the two Illustration Stations being closed.

Much interest is being shown in the Boys' and Girls' Clubs. They are improving each year. The following clubs were organized with good results: Two Beef Calf Clubs, one Swine Club, and one Potato Club.

I am enclosing herewith threshers' reports which have come to hand to date, with ten more operators to hear from. The following are the totals:—

Spring wheat (bu.)	1,449,179	Red clover (bu.)	2,110
Winter wheat (bu.)	8,181	Brome-grass (lb.)	8,840
Oats (bu.)	848,275	Sweet clover (lb.)	9,530
Barley (bu.)	136,762	Timothy (lb.)	995
Peas (bu.)	500	Alfalfa (lb.)	3,600
Flax (bu.)	7,479	Buckwheat (bu.)	27

A much larger increase in acreage of alfalfa has been grown this year with very good results for seed. In some districts the seed has not set as readily as in others, but there is much more interest being taken in the growing of alfalfa on the white wooded soils than formerly, with success.

There have been very few new applications for assistance to settlers this year. Several of the cases previously granted assistance are now self-supporting.

The Farmers' Institutes are continuing to do good work in their respective districts. Some forty-five meetings were attended during the year and several lectures were accompanied with the motion-picture machine, which is very helpful. A good attendance at all meetings. The Women's Institutes are doing good work, turning most of their efforts to Red Cross and war work.

Fairly good co-operation was received from farmers for the control of weeds on their own places. Both the Weed Inspectors did good work during the time they were on.

This district was very fortunate in having the Honourable K. C. MacDonald, Minister of Agriculture, and J. B. Munro, Deputy Minister of Agriculture, spend a considerable time here in August. Meetings were addressed at Pouce Coupe, Dawson Creek, Rolla, Tupper Creek, Baldonnel, Fort St. John, and Hudson's Hope, where the attendance in all cases was most satisfactory. The several meetings arranged under the auspices of the Farmers' Institute were also attended by Thomas Jamieson, Advisory Board Member for District "J," and settlers generally were afforded an opportunity on these occasions of discussing with the Minister and officials the agricultural problems of particular concern in the several areas.

Everything in connection with the Department has been very successful throughout the district this year and much has been done to improve the quality of seed, swine, sheep, and live stock generally. We are going into the winter with very little fall work being done owing to the very dry fall. Unless a lot of snow falls before spring or we have a wet period after seeding, prospects do not look any too hopeful for next year's crop. A fair amount of summer fallow was well worked during summer and fall.

SHUSWAP-COLUMBIA VALLEY.

WM. MACGILLIVRAY, DISTRICT AGRICULTURIST.

During the few months I have had the honour of being your representative at Salmon Arm it has been possible to secure only a superficial acquaintance with the extensive territory for which I am responsible.

The 1940 growing season was somewhat drier and with higher temperatures than average. An unusually fine fall with, especially in the East Kootenays, very heavy rains, produced an abundance of fall growth. Consequently, live stock, after suffering from dried out and depleted summer pastures, made exceptionally good gains and entered the winter in very good condition.

Yields of hay, especially alfalfa, under irrigation were average or better. Grain-crops were not as good as in 1939.

Throughout the whole area and especially the Columbia Valley potatoes were an excellent crop and from Golden to Fernie yields were heavier than for many years. Prices in the Kootenays were very low and reports received indicated that at Fernie potatoes were selling at $10 to $12 per ton in October. Several producers in the Cranbrook area were of the opinion the districts referred to should be under the control of the Interior Vegetable Marketing Board.

Throughout the whole area the sale of hay is a problem of increasing difficulty. For the past three years stocks of this commodity have been accumulating and on many farms the entire yield for two and three years past is in stock storage. Especially is this evident in the area from Golden to Windermere. The long haul to the Coast market and the lack of demand there and from Alberta combined with good annual yields to cause an exceedingly serious situation.

Lack of markets means lack of cash and lack of purchasing-power. In most of the area under review monthly cream cheques represent the regular cash income of a large percentage of the farmers. Last year the Farmers' Co-operative Creamery at Golden increased its make of butter. In the territory tributary to Salmon Arm, the Co-operative Creamery at that point and at the one at Enderby, along with the cheese-factory at Armstrong are working to capacity. Fortunately, there has been an improvement in the price of butter-fat these last few months and it was hoped that local creameries would have been able to pay around 34 or 35 cents per pound for butter-fat delivered in December. The recent action of the Wartime Prices Board in pegging the price of butter at the figures ruling on December is very strongly resented locally. The increased cost of production warrants a winter price of 35 cents and a summer price of 25 cents for butter-fat and it is felt that once again the farmers' interests

have been sacrificed to quell the ill-founded if vociferous protests of consumers' and housewives' organizations.

Hog production was materially increased this past year. The introduction of compulsory rail-grading met with a mixed reception, but the farmer with the hogs of the right type who uses proper production and feeding methods and markets at the right weight is making more money than he did under the old system of selling all hogs on a straight bacon grade, which was the rule in the Interior.

Producers who grow their own grain and have some skim-milk are not losing money at present prices of grain and pork, but any hog-raiser who has to buy his feed and protein supplement is finding pig production a costly business. Lower freight rates for Alberta grain and mill-feeds are essential if British Columbia is to maintain or increase hog production.

There must also be a price adjustment when Interior producers are paid Calgary prices of say $9.65 for B1 hogs. The price quoted at Vancouver for that grade is $10.50 to $10.75 per hundredweight. Interior hogs should sell for not more than a 50-cent spread at shipping-point, under Vancouver prices.

During the past year about thirty-eight cars of hogs were shipped from Salmon Arm and about forty-five cars from the Northern Okanagan. Rail-grading statistics show that from Salmon Arm 29 per cent. of the hogs graded A or select and 29 per cent. B1 or basic grade; or a total of 58 per cent. in the two top grades. Light and heavies totalled 12 per cent. The figures for Armstrong District are somewhat similar. Dressing percentages range from 68 to 77 per cent. and average around 72 per cent.

It is gratifying to note that beef-cattle production has received a stimulus in certain districts such as Invermere, Canal Flats, Jaffray, and Newgate. There is a strong desire for improved quality and all possible assistance should be given these districts in their production and marketing problems. For example, the logical market for the Newgate-Baines Lake-Jaffray Districts is Spokane and the men in those districts should be encouraged to explore that outlet.

In several cases men who are shipping a little cream from straight dairy-bred cows have been advised to use a Shorthorn bull and work into more of a dual-purpose herd, retaining the young stock for beef and using up more hay and home-grown grains and putting more farm-yard manure back on the land.

Prices for lamb and wool have been very good. Co-operatively shipped wool will net around 21 cents per pound. Lambs are selling at Vancouver at 9½ to 10 cents. Generally speaking, sheepmen are buying lower blockier rams that will produce earlier maturing lambs of better conformation. The B.C. Sheep Breeders' Association at Kamloops continues to give valuable service to its members in wool marketing, orderly marketing of lambs, and in the purchase of essential supplies. Lack of summer range hinders the development of the range sheep industry, but there is considerable room for an increase in farm flocks and thus a further means of consuming surplus hay. Sheep as weed-destroyers are of greater value than is generally recognized.

It is most unfortunate that there has been such a lack of interest in cow-testing work. No dairy-farmer can afford to keep a boarder cow and the scales and Babcock tester are his yardstick.

Numerous complaints have been received as to the incidence of abortion and breeding diseases. Particulars have been passed on to the Live Stock Commissioner. There is a demand for R.O.P. bulls in the smaller dairy herds and assistance in locating suitable sires is being given.

There does not seem to be a very great revival in horse-breeding. The development of smaller tractors and suitable equipment has led to a lessening demand for horses. Service fees of $12 to $15 are out of line with present prices of horses. A farmer can sell a 2-year beef steer, grass fat, for $60 to $70, but he can raise a 1,200- to 1,400-lb. farm chunk to 4 or 5 years of age and sell him for less than the price of a 2-year-old steer that has never had a bite of grain. Generally, there is a limited demand for lumbering for the heavy draughter, 1,600 lb. and over, while the low-set, wide-ribbed, easy-keeping farm chunk is wanted in certain districts at certain times.

There is little to report in poultry, most farmers are buying in day-old chicks and paying more attention to the care necessary for increased production. Three Chicken Clubs

completed the season, Grindrod, Salmon Arm West, and Canoe. Two Potato Clubs were operated successfully; Grindrod and Revelstoke. Muriel Parker, of the latter club, was successful in gaining a first prize with Columbia Russets at the Potato Show held at Vancouver in November. A grade Dairy Calf Club was operated at Enderby and a Beef Club is being organized at Armstrong.

Your representative judged the Ram Sale at Kamloops in September and the Fat Lambs at the second Christmas show held there in December. This latter show of over 750 fat lambs was the largest ever staged in Western Canada, while the quality was outstanding.

Sheep classes were judged at the Interior Provincial Exhibition at Armstrong and all classes of live stock at Windermere and Golden. Field crops were judged at Celista.

Assistance was rendered in the management of the Tranquille dispersion sale and at the Kamloops Ram Sale and Christmas Fat Stock Sale. Meetings have been addressed at Gleneden, Mount Ida, Malakwa, Revelstoke, Salmon Arm (2), Kamloops, and Grindrod. The annual meeting of the Kamloops Farmers' Institute was addressed and in company with the Deputy Minister the annual meeting of District "I" Farmers' Institutes at Kamloops was attended.

Arrangements were also made for well-attended meetings addressed by Dr. W. R. Gunn, Live Stock Commissioner, at Gleneden, Grindrod, and Salmon Arm. These latter meetings and one at Armstrong were attended by Roy C. Trimble, Live Stock Products Grader, Vancouver, who discussed rail-grading of hogs. Jack Byers, Supervisor of Live Stock, Federal Department of Agriculture, addressed one meeting at Armstrong and two at Salmon Arm on some of the problems the war has brought to agriculture.

Alternative cash crops are sought by most farmers. Low prices for butter-fat, for grain, a lack of demand for hay, no demand for horses, and the small returns from even the best handled hogs combine to reduce farm income dangerously.

Pea-growing under contract has been tried with some success in the Salmon Arm-Armstrong Districts. This past year returns were lower. Geo. P. Jackson, of Salmon Arm, had a yield of 11 tons on 5 acres—the best in the district. Some interest is being shown in the production of corn for grain, and others are interested in soy-bean growing.

Perhaps closer attention to good clean seed, weed eradication, and general better farming practices would yield results beyond expectation. Much more could be done by seeding-down marginal and other land to better permanent and temporary pastures. The improvement and rotation of present pastures is well worth consideration. The production of more barnyard manure and its better application would help a great deal. Consideration should be given by many farmers to the provision of liquid-manure tanks and the application of that very valuable fertilizer to the soil.

A more intelligent use of pastures and home-grown feeds would cut down overhead in live stock operations. Much remains to be done in finding ways of using waste orchard products for live stock use. More experimental work in growing corn for grain should be conducted, with emphasis on hybrids that mature early enough for this area. Field Crop Union tests should be extended and the results of these and from Federal Illustration Stations more closely studied and conveyed to the general farming community.

A very extensive field of endeavour awaits in production, disease, and nutritional problems of live stock. And last, but by no means least, the formation of co-operative farmers' organizations, especially in the field of marketing, should be prosecuted relentlessly.

GRAND FORKS.

G. L. Landon, B.S.A., District Agriculturist.

Crops were generally good throughout the district, although the hot dry spell in June and July reduced the yield of grain considerably. A survey of crop acreages in the Grand Forks Valley was made in May but the figures are on file in the Grand Forks office.

The small-fruit and tree-fruit crops were good, but figures on the yields are not available at present. Processing of a portion of the small-fruit crop was continued this year.

There was the usual campaign against insects, the two of greatest economic importance being grasshoppers and Colorado potato-beetle.

Grasshoppers are definitely on the down grade portion of their cycle. Very little money and time was expended this year in the Midway Grasshopper-control Zone. The figures show

the expenditure in the zone for the past three years at 1938, $581.87; 1939, $472.75; and 1940, $70.74.

The usual trouble from plant diseases was experienced, and an outbreak of tomato wilt occurred in connection with the growing of the tomato plants for the large acreage grown for the new cannery.

The outstanding event in the agriculture of Grand Forks was the establishment of the tomato-cannery in the old cannery building. A large expenditure was made renovating the building, installing machinery, etc. Some 350 acres were planted to tomatoes and 250 acres to peas for growing cannery seed-peas. Owing to a late spring and a late start with the tomato plants, it appeared that the crop would be late in maturing and consequently the bulk of the pack would be caught by early frosts. However, fine weather prevailed until late October and some 70,000 cases of tomatoes were packed. From information at hand, it is reported that an excellent product was put up and the entire crop sold. The average price paid to the grower is not available, but I would consider that most growers had a satisfactory return. Naturally, some growers had much heavier yields than others.

Vegetable-seed production continues to expand and greatly increased markets are available owing to war conditions. The seed-crop was good both from a yield and quality standpoint. The seed-control zone continues to operate satisfactorily.

No change was noted in live-stock production in the district. Prices for beef cattle were fairly good and the usual shipments made. Several farmers undertook to finish car-loads of beef cattle during the year and turned out some very good beef. Not all of them were satisfied with the returns received.

The campaign started in 1939 to combat sleeping sickness in horses (Encephalomyelitis) was continued during 1940 but with a sharp reduction in the number of horses vaccinated. Owing to no cases of the disease in 1939, it was very difficult to persuade farmers to vaccinate in 1940. From newspaper reports it appears there were some cases in the late summer of 1940 in Rock Creek District.

Owing to absence from the district, the only experimental project continued during the year was the one on wood-tick control. This was extended to include several herds during the year and the experimenters were instructed to send in reports to Dr. Gunn.

Two Potato Clubs were organized at Rock Creek with fourteen members growing Warba potatoes.

Poultry Clubs continue very popular in the district, particularly Baby-chick Clubs. There was a reduction in the number of clubs and club members as compared with 1939. There were six clubs in the district—five at Grand Forks and one at Rock Creek—with a membership of fifty-six. There were two clubs with White Leghorns, two with Rhode Island Reds, and two with New Hampshires.

APPENDICES.

APPENDIX No. 1.

EXPORTED NURSERY STOCK.

Two hundred and twenty-two shipments of nursery stock in 448 containers, valued at $7,258.80, comprised the total exports for the year. The particulars are listed under the various countries concerned.

Countries.	Fruit-trees.	Small Fruits.	Orna-mentals.	Roses.	Plants.	Roots.	Bulbs.	Scions.	Conifer-seed.	Spruce Cones.	Sweet-pea Seed.	Miscellaneous.
									Lb.	Sacks.	Pkts.	
Australia	12	.....	4	.....	.....	13	878	.....	.....	.....	.....	
China	.....	.....	33	96	36	12	35	.....	.....	.....	.....	
Denmark	.....	.....	.....	.....	.....	.....	.....	.....	43	.....	.....	
Guiana (British)	.....	.....	6	62	.....	.....	.....	.....	.....	.....	.....	
Ireland	.....	.....	.....	.....	.....	.....	.....	.....	¼	.....	.....	
New Zealand	.....	.....	.....	.....	.....	.....	710	.....	620	.....	.....	
South Africa	.....	.....	.....	.....	.....	.....	28	.....	.....	.....	.....	
United Kingdom	.....	.....	.....	.....	.....	.....	14,510	.....	.....	.....	.....	
United States	784	401	955	481	1,760	18	77,123	29,931	1,119½	24	244	10 lb. mountain-ash berries, 28½ lb. chestnuts.
Totals	796	401	998	639	1,796	43	93,284	29,931	1,782¾	24	244	10 lb. mountain-ash berries, 28½ lb. chestnuts.

APPENDIX No. 2.

Exported Plant Products—January 1st, 1940, to December 31st, 1940.

Commodity.	Country.	Containers.	Value.	Inspections.
Apples	United Kingdom	455,132	570,852.63	614
	Egypt	6,804	8,506.00	9
	Panama	100	114.00	1
	South America	63,813	81,405.58	82
	South Africa	9,115	14,079.09	20
	Malay States	13,864	20,450.50	32
	Fiji Islands	295	453.75	7
	China	264	379.45	24
	Dutch East Indies	1,725	2,501.25	5
	India	6,200	8,438.00	13
	Iraq	2,268	2,403.00	3
Wheat	Philippine Islands	462	893.88	11
Oats	British West Indies	250	500.00	1
	Philippine Islands	400	628.80	1
Potatoes	China	800	655.00	3
	U.S.A.	1,700	2,252.50	1
Onions	Guatemala	20	28.00	2
	Fiji	344	817.00	5
Timothy-seed	New Zealand	100	314.00	1

The above represents exported plant products shipped only from Vancouver and New Westminster for which certificates were issued in British Columbia.

APPENDIX No. 3.

Small-fruit and Rhubarb Acreage, 1920 to 1940.

	1920.	1922.	1924.	1926.	1928.	1930.	1932.	1934.	1936.	1938.	1940.
Strawberries	1,796	2,886	2,331	2,042	3,005	2,198	2,264	2,944	3,312	3,338	3,292
Raspberries	967	2,105	2,387	1,641	1,258	1,060	1,077	1,371	1,438	1,424	1,194
Loganberries	209	506	764	802	713	821	844	697	628	648	703
Blackberries	210	329	252	178	170	120	158	156	140	133	74
Red currants	23	42	58	34	42	22	20	36	42	36	24
Black currants	62	138	239	192	179	149	159	272	326	255	248
Gooseberries	56	85	96	68	69	60	71	112	112	57	53
Rhubarb	91	111	183	244	320	382	396	571	685	572	395
Totals	3,414	6,202	6,310	5,201	5,756	4,813	4,989	6,159	6,683	6,463	5,983

APPENDIX No. 4.

THRESHERMEN'S RETURNS, 1939.

This statement has been compiled from reports submitted by District Officials of the Department of Agriculture.

Area.	Number of Threshing-machines.	Spring Wheat.	Winter Wheat.	Oats.	Barley.	Peas.	Rye.	Legume-seed.	Timothy.	Miscellaneous Grains and Seeds.	
		Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Lb.	Lb.		Lb.
Kamloops and District	27	66,735	34,696	74,603	35,738	602	9,956	2,102	.....	Soy-beans,	1,020
Kelowna	3	8,565	13,699	26,357	7,779	132	.....	6,000	.....	Beans,	480
Smithers	34	18,410	2,421	120,050	16,527	359	273	24,365	1,745,257	Fescue, Brome, Speltz,	3,000 6,500 6,600
Creston	5	498,278	58,722	19,240	1,000	.....	.....	.....	.....	.....	.....
Kootenay and Arrow Lakes	11	4,177	1,227	18,749	903	51	.....	.....	.....	.....	.....
Armstrong, Vernon, Lumby	22	93,869	119,214	155,724	39,312	20,503	13,129	96,020	.....	Crested wheat, Beans, Flax,	9,000 838 2,160
Peace River Block	85	1,231,184	1,163	970,493	101,122	2,708	1,743	6,246	820	Flax, Brome,	1,441 5,700
Cariboo	11	13,873	1,410	42,498	10,617	.....	2,450	.....	.....	.....	.....
Prince George	34	18,317	4,146	169,635	7,774	163	761	140,289	.....	Alsike and timothy, Brome,	61,000 200
Boundary	9	45,072	17,199	15,083	3,783	.....	1,872	.....	.....	.....	.....
Vancouver Island	28	5,927	34,189	144,630	11,310	3,570	160	.....	.....	Wheat and vetch,	423
Fraser Valley	42	9,712	1,542	617,720	12,878	2,612	.....	18,160	.....	Vetch, Flax, Mixed grain,	360 6,160 1,500
Salmon Arm and Kootenay	18	17,651	8,100	74,760	23,370	12,168	194	7,475	.....	.....	.....
Totals	329	2,031,770	296,728	2,458,546	272,113	43,048	30,538	300,657	1,746,007		107,388

APPENDIX No. 5.

Summary of Year's Movement of Grain Screenings, 1940.

Month.	Consumed in British Columbia.								Export direct from Elevator.		Quantity per Month.	
	No. 1 Feed.		No. 2 Feed.		Uncleaned.		Refuse.		All Grades.		All Grades.	
	Tons.	Lb.	Tons.	Lb.	Tons.	Lb.	Tons.	Lb.	Tons.	Lb.	Tons.	Lb.
January	30	.....	80	.....	828	1,260	83	.....	60	.....	1,081	1,260
February	40	.....	.....	.....	550	140	13	90	166	1,000	769	1,230
March	.....	.....	77	.....	148	900	54	.....	45	.....	324	900
April	.....	.....	118	.....	106	320	161	1,230	30	.....	415	1,550
May	.....	.....	55	.....	47	360	.....	680	.....	.....	102	1,040
June	.....	.....	.....	.....	33	850	11	620	.....	.....	44	1,470
July	160	.....	110	.....	210	.....	14	1,000	.....	.....	494	1,000
August	.....	.....	.....	.....	95	800	14	1,740	80	.....	190	540
September	.....	.....	.....	.....	67	980	6	580	.....	.....	73	1,560
October	.....	.....	59	.....	142	1,700	63	600	60	.....	325	300
November	.....	.....	17	.....	130	200	65	500	60	.....	272	700
December	.....	.....	46	.....	242	.....	52	700	.....	.....	340	700
Total, 1940*	230	.....	562	.....	2,601	1,510	539	1,740	501	1,000	4,435	250
Total, 1939	719	.....	980	1,600	6,885	470	427	870	2,782	1,550	11,795	490
Total, 1938	157	1,100	1,115	450	5,754	1,410	495	1,350	4,151	270	11,674	580

Note.—In addition to the above figures, 40 tons of oat screenings were removed from British Columbia elevators for local consumption.

APPENDIX No. 6.

Summary of Premises visited and Cattle T.B.-tested, 1940.

District.	No. of Premises.	Cattle tested.	No. of Reactors.
Coast Points	37	280	----
East Kootenay	174	2,027	3*
West Kootenay	116	716	10†
Okanagan	80	675	----
Interior	79	1,133	----
Lillooet	3	44	4†
Cariboo	17	164	----
Central B.C.	131	895	----
Peace Block	202	1,074	2*
Totals	839	7,008	19

* Cattle brought in from Alberta.
† All in one herd.

Vancouver Island Restricted Area.

First general test—

Number of herds	3,043
Cattle tested	18,255
Reactors uncovered	123

APPENDIX No. 7.

Summary of Dairy Premises inspected and graded under "Milk Act," December 1st, 1939, to November 30th, 1940.

District.	No. of Premises.	No. of Cattle.	Grade of Premises.			Ungraded.
			A.	B.	C.	
Vancouver Island	416	8,668	308	105	1	2
Coast Points	37	280	10	6	.....	21
Okanagan	65	1,029	7	48	.....	10
Interior	70	1,114	3	58	.....	9
Lillooet	3	44	.....	3	.....	.....
West Kootenay	77	649	4	16	.....	57
East Kootenay	178	2,260	63	35	.....	80
Cariboo	17	164	2	2	.....	13
Central B.C.	131	895	15	16	1	99
Peace Block	202	1,074	.....	.....	.....	202
Lower Fraser Valley	2,880	51,723	173	2,556	151	.....
Totals	4,076	67,900	585	2,845	153	493

APPENDIX No. 8.

Cow-testing Associations in British Columbia, 1940.

Name.	Instituted.	Secretary.	Supervisor.	Departmental Grant.
Bulkley Valley	Oct., 1926	W. Billeter, Smithers	F. R. Annis	$600
Chilliwack, Route 1	March, 1913	J. J. Andrews, R.R. 2, Chilliwack	Wm. Rose	660
Chilliwack, Route 2	Nov., 1928	J. J. Andrews, R.R. 2, Chilliwack	J. E. Manning	660
Chilliwack, Route 3	April, 1927	J. J. Andrews, R.R. 2, Chilliwack	H. R. Connolly	555
Chilliwack, Route 4	April, 1938	J. J. Andrews, R.R. 2, Chilliwack	H. C. Clark	640
Comox Valley	April, 1914	W. E. Mantle, Sandwick	Allen Wilson (Leslie McKinnon)	570
Delta	June, 1937	J. T. Oliver, New Westminster	J. H. Wood (Geddes Jess) (Leslie McKinnon)	660
Dewdney-Deroche	Oct., 1930	G. G. Grimes, Deroche	R. Macgregor	610
Langley	June, 1914	B. J. A. Campbell, Murrayville	R. A. Wilson	660
Matsqui	Oct., 1937	H. G. Rottluff, Matsqui	L. W. Falk (W. E. Hawthorne)	650
Okanagan	April, 1920	J. F. Munson, Kelowna	Malcolm Gibson	585
Pitt Meadows-Maple Ridge	Nov., 1925	S. T. Rippington, Pitt Meadows	Wm. E. Hooson	660
Richmond-Ladner, Route 1	March, 1919	S. H. Gilmore, R.R. 2, Eburne	Geddes Jess (D. S. Heelas)	660
Richmond-Ladner, Route 2	Nov., 1938	S. H. Gilmore, R.R. 2, Eburne	T. Crowley	610
Salmon Arm-North Okanagan	July, 1929	B. H. Morris, Enderby	Malcolm Gibson (J. H. Wood)	565
Sumas	Nov., 1923	B. Stewart, Abbotsford	D. S. Heelas (J. J. Andrews)	660
Surrey	Nov., 1924	F. McKinnon, Box 11, Cloverdale	J. E. Wingrove	660
Vancouver Island (South)	April, 1929	R. Rendle, 1118 Johnson St., Victoria	T. G. M. Clarke	660

APPENDIX No. 9.

BEEF GRADING, 1940, CARCASSES GRADED.

	Steers and Heifers.					Cow.			Out.	Total.
	A1.	A.	B.	C.	D.	B.	C.	D.		
January	330	1,902	2,127	578	79	148	205	140	457	5,966
Per cent.	5.5	31.8	35.6	9.7	1.3	2.4	3.4	2.3	7.6	
February	381	1,752	1,905	564	96	86	142	117	319	5,362
Per cent.	7.1	32.6	35.5	10.5	1.8	1.6	2.6	2.1	5.9	
March	712	2,704	2,219	520	101	104	159	138	327	6,984
Per cent.	10.2	38.7	31.7	7.5	1.4	1.5	2.3	1.9	4.6	
April	550	2,244	2,082	441	57	96	90	91	314	5,965
Per cent.	9.2	37.6	34.9	7.4	0.9	1.6	1.5	1.5	5.2	
May	495	2,552	2,568	855	151	105	151	97	387	7,379
Per cent.	6.7	34.6	35.0	11.5	2.0	1.4	2.0	1.3	5.2	
June	338	1,878	1,559	408	73	175	233	100	257	5,021
Per cent.	6.7	37.4	31.0	8.1	1.5	3.5	4.6	2.0	5.1	
July	240	1,740	1,582	323	34	337	367	155	233	5,011
Per cent.	4.8	34.7	31.1	6.5	0.7	6.7	7.3	3.1	4.7	
August	274	2,498	2,158	530	89	378	333	148	356	6,764
Per cent.	4.0	36.9	31.9	7.9	1.3	5.6	5.0	2.2	5.2	
September	289	2,065	1,654	392	59	304	294	138	405	5,600
Per cent.	5.1	36.8	29.5	7.0	1.0	5.4	5.2	2.4	7.2	
October	270	2,158	1,845	391	76	319	377	191	669	6,296
Per cent.	4.2	34.2	29.3	6.2	1.2	5.0	6.0	3.0	10.6	
November	397	2,491	2,377	574	119	363	390	258	1,428	8,397
Per cent.	4.5	29.6	28.3	6.7	1.4	4.3	4.6	3.0	17.0	
December	359	1,915	1,627	214	38	179	190	97	331	4,950
Per cent.	7.2	39.0	33.7	4.3	0.7	3.6	3.8	1.9	6.6	
										73,695

Total tonnage, 40,818,462.

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