PROVINCE OF BRITISH COLUMBIA

THIRTY-THIRD ANNUAL REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR THE YEAR 1938

PRINTED BY
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1939.

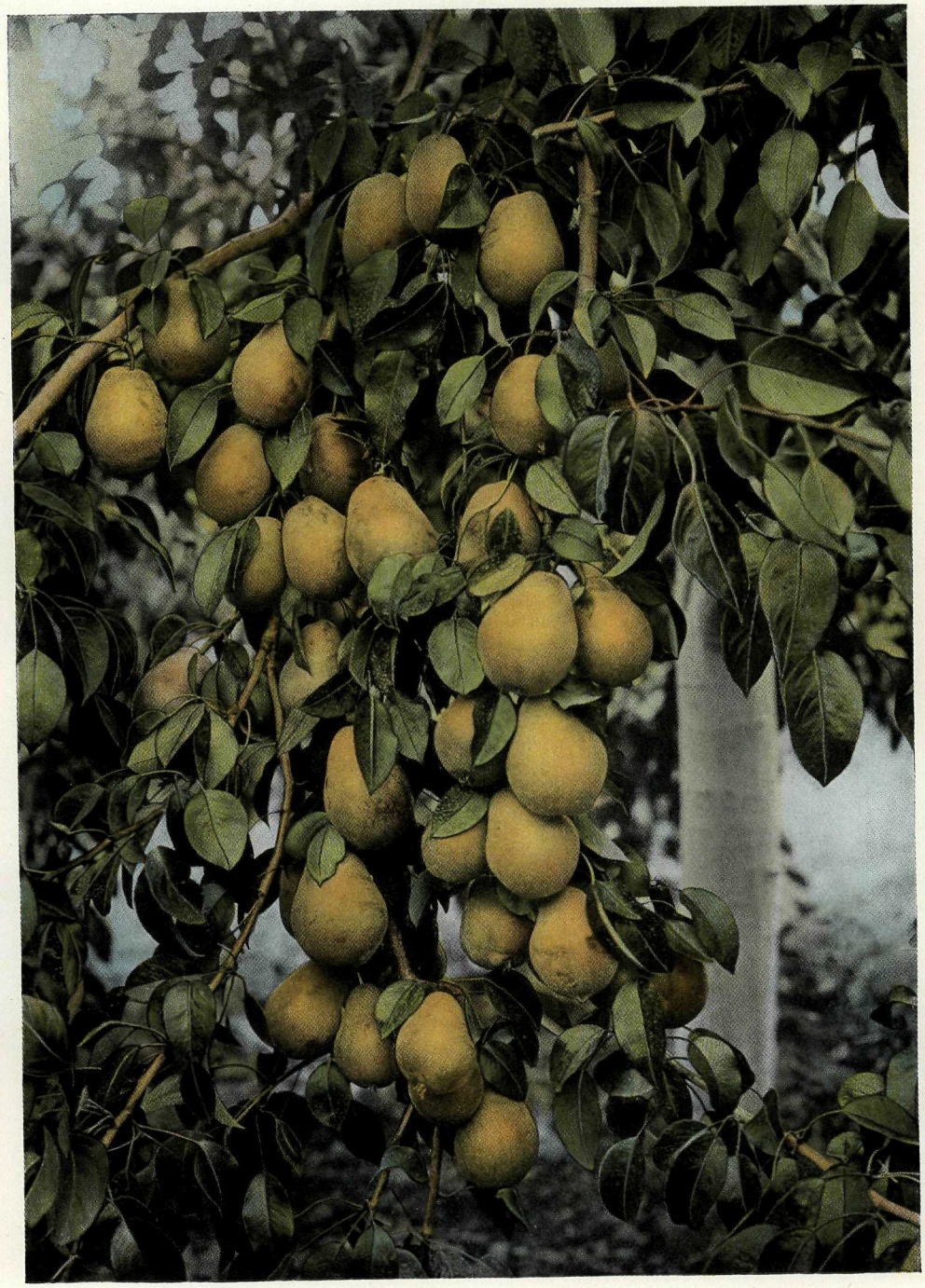
To His Honour E. W. HAMBER,
Lieutenant-Governor of the Province of British Columbia.

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 1938.

K. C. MACDONALD,
Minister of Agriculture.

Department of Agriculture,
Victoria, B.C., March 10th, 1939.



BRITISH COLUMBIA PEARS.

REPORT *of the* DEPARTMENT OF AGRICULTURE.

REPORT OF DEPUTY MINISTER OF AGRICULTURE.

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

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, 1938.

As the personnel of the Department is practically unchanged from that of last year, the list of Department of Agriculture officers which was printed in the 1937 Report is not reproduced this year.

NEW LEGISLATION.

The following is a summary of the legislative enactments of definite interest to farmers, introduced by the Minister of Agriculture and passed at the recent session of the Legislature.

Bill No. 2, "Stock-brands Act Amendment Act, 1938."—For the better protection of the interests of the stockmen of the Province this amendment to the Act requires that fox-ranchers and others who slaughter horses for animal food are to be licensed and that they are to keep records of all horses purchased and slaughtered.

It further provides that dealers in cattle and horses are to be licensed under the "Stock-brands Act" and are to be more effectively controlled in their activities. That agents and branches of firms, as well as principals, must secure licences for dealing in cattle, horses, and hides. Live stock shipped to and from exhibitions without change of ownership is exempt from payment of fee of brand inspection. Provision is made for regulations and for minor changes to facilitate operation.

In the "Table of Fees" the cost for renewal of registration of a brand is reduced from $2 to $1 per annum. The cost of a licence to slaughter horses for animal food is placed at $5 per annum, while the cost of a stock-dealer's licence, formerly listed under the "Trade Licences Act" at $50, payable each six months, is now included under the "Stock-brands Act" at $25 per annum.

Bill No. 23, "Horse-breeders' Registration and Lien Act Amendment Act, 1938."—This amendment provides for the revision of forms for the enrolment and inspection of stallions standing for service in British Columbia. It further provides that no person shall advertise a stallion for service within the Province unless it has been examined by an official and legally enrolled, also authority is granted to the Minister, acting upon recommendation of the Live Stock Commissioner, to prescribe what class of stallion shall stand for service within any designated area and to prohibit the travelling within a designated area of any stallion that is not of the prescribed class. The amendment also provides for the making of regulations for the purpose of the Act.

Bill No. 24, "Noxious Weeds Act Amendment Act, 1938."—For the purpose of enabling land-owners in any district to effectively co-operate in eradicating noxious weeds or controlling their spread, this amendment provides for the meeting of land-owners to discuss the constitution of a weed-control area and the petitioning for constitution of such area. It gives power to the Lieutenant-Governor in Council to constitute the area and the committee, also to dissolve the weed-control area and committee. It indicates the duties of the committee and gives power to the Lieutenant-Governor in Council to make such regulations as may be considered necessary or advisable. It also defines "committee," "owner," and "weed-control area."

Bill No. 25, "Plant Protection Act Amendment Act, 1938."—Under this amendment where a property-owner fails to observe any regulations concerning pruning, spraying, or otherwise treating fruit-trees or other vegetation in accordance with departmental regulations, the Minister, upon receiving a report of an Inspector, may direct that the necessary work be done by the Department and that the cost be assessed against the owner of the land. It further empowers any employee or agent of the Department to enter upon the land to carry out the necessary work.

Bill No. 77, "Contagious Diseases (Animals) Act Amendment Act, 1938."—This amendment has particular reference to the probable emergency that may arise in connection with encephalomyelitis disease of horses in districts where the services of qualified veterinarians are not available. It permits of the appointment of Inspectors and other officers without requiring that they be graduates of a recognized school of veterinary surgery. It also permits of Provincial Police officers being authorized to assist in carrying out the provisions of this Act.

In addition to the above-mentioned Acts which were introduced by the Minister of Agriculture, there were three others which are of particular interest to farmers and settlers. These include:—

"Land Settlement and Development Act Amendment Act, 1938."—Which provides for the adjustment of accounts of individuals who have purchased property or secured loans from the Land Settlement Board.

"Trade Licences Act Amendment Act, 1938."—Which relieves stock-dealers of the payment of a $50 licence fee every six months, as these dealers may now be licensed under the "Stock-brands Act" upon payment of an annual fee of $25.

"Game Act Amendment Act, 1938."—Which raises from 3 to 5 acres the property qualifications of a "farmer." Requires that a farmer or his employee must possess a licence to shoot game birds which may be destroying his crops, and includes "badgers" among the protected fur-bearing animals.

I would particularly draw to your attention the last-mentioned item, the "Game Act Amendment Act." It has been noted that badgers have been very effective in providing a natural control for gophers and other burrowing rodents. Farmers in those districts where badgers have been introduced or have established themselves desire the protection of these animals.

This amendment places the badger on the list of protected fur-bearing animals and killing of this species during the closed season is an offence subject to $25 minimum fine. This information will be welcomed by those farmers who have had an opportunity of observing the beneficial activities of the badger.

NEW REGULATIONS.

Equine Encephalomyelitis.—In August of this year it was learned that sleeping sickness of horses, which for several seasons has been prevalent in the Canadian Prairies and the Western States, had broken out in Alberta districts not far from the British Columbia boundary. As horses were being brought into this Province through the Crowsnest Pass and by other routes it was anticipated that the disease would be introduced among our horses.

As a preventive measure a regulation was passed and approved by the Lieutenant-Governor in Council declaring encephalomyelitis an infectious or contagious disease under the provisions of the "Contagious Diseases (Animals) Act" and prohibiting the movement from place to place of horses that had been exposed to infection or kept within an area where encephalomyelitis was known to exist, unless such horses had been satisfactorily vaccinated against the disease.

In the reports of the Chief Veterinary Inspector and of the Live Stock Commissioner reference is made to the occurrence of encephalomyelitis in Kootenay County and in other areas adjacent to Alberta. By promptly acting in accordance with the above-mentioned regulation in placing suspected horses under quarantine and subjecting them to vaccination the progress of the epidemic was halted. Perhaps not more than a score or two dozen horses died in British Columbia as a result of the disease, but the danger from it is by no means over. Veterinarians expect that there will be further outbreaks next summer in those areas where there were scattered or isolated cases this year. Plans are being worked out for effectively dealing with equine encephalomyelitis in British Columbia in the coming season.

Beef Grading Regulations.—In the thirty-second annual report of the Department reference was made under the heading of "New Legislation" to the "Beef Grading Act," under which authority was given for the making of regulations. After a number of conferences between officials of Federal and Provincial Departments of Agriculture and meetings of individuals and firms interested in wholesale and retail merchandising of beef in

Greater Vancouver, regulations were finally drafted and approved by Dominion authorities. These regulations were approved by His Honour the Lieutenant-Governor in Council and were proclaimed to take effect at midnight on December 4th. During the four weeks in which these regulations have been in force there has been evidence of a definite desire on the part of the majority of dealers to comply with the requirements, and a satisfactory reaction on the part of consumers within the area. It is possible that amending regulations may be required, because this beef grading is still in the experimental stage and the regulations as at present may not be sufficiently definite for eventualities that can be expected to arise.

STOCK-BRANDS HISTORY.

A further amendment to the "Stock-brands Act" made at the recent Session of the Legislature recalls the fact that a draft of an Act to regulate branding and marking of animals was laid before the Colonial Government at Victoria just seventy years ago, when Alexander Caulfield Anderson presented an application asking that the provisions of the Act include horned cattle, horses, swine, sheep, and other domestic animals.

The proposal was that the local magistrate should act ex officio as General Superintendent of Brands; Registrars of Brands and Marks to be appointed by the Magistrate or other authority in the several districts; such Registrars to be compensated by a small fee for each registry made and each Registrar was to keep a duplicate register for reference.

It was recommended that "settlers now actually in possession of brands or marks be required to register; and where their brand or mark is not sufficiently distinctive from those of the neighbours, already registered, would be required to alter for the future to the satisfaction of the Registrar. In any case of disputed claim to any particular mark, priority of adoption to be grounds for decision in favour of the oldest claimant."

A further suggestion was that "any new settlers be not allowed to assume a brand or mark, or to continue a former brand or mark, without having previously ascertained from the Registrar that it does not conflict with other brands or marks already registered, and then be allowed to register an approved brand or mark on payment of the established fee."

Since these proposals were presented to the Colonial Government seventy years ago the "Stock Brands Act" has been passed and has undergone a number of alterations.

This bit of historical information is included here for the information of those ranchers who are interested in the history of the Legislative enactment as well as the practical application of the measure that has been recently amended.

AGRICULTURAL ANNIVERSARIES.

This is a year of agricultural anniversaries in British Columbia. One hundred and sixty years ago Captain James Cook arrived at Nootka, on the west coast of Vancouver Island, in the course of his northern voyage of exploration, in which he carried live stock, poultry, and the seeds of farm crops for the improvement of agriculture in the new lands that he hoped to visit. The agricultural phase of his voyage had the endorsation of His Britannic Majesty, King George III., who authorized him to convey cattle, sheep, and other farm live stock, as well as seeds, to distant lands where improved breeds and varieties might be of benefit to the people.

From the first page of the narrative of his round-the-world voyage, which commenced in 1776 and lasted until the return of his successor in England in 1780, the records of his remarkable exploits contained references to matters of agricultural interest. The fourth paragraph of the narrative of this third voyage, extending to the North Pacific and touching at the islands along the British Columbia coast, reads as follows:—

"With the benevolent view of conveying some permanent benefit to the inhabitants of Otaheite, and of other islands of the Pacific Ocean, whom we might happen to visit, His Majesty having commanded some useful animals to be carried out, we took on board, on the 10th (of June, 1776) a bull, two cows with their calves, and some sheep, with hay and corn for their subsistence; intending to add to these other useful animals, when I should arrive at the Cape of Good Hope. I was also, from the same laudable motives, furnished with a sufficient quantity of such of our European garden seeds as could not fail to be a valuable present to our newly discovered islands, by adding fresh supplies of food, to their own vegetable productions."

Throughout the whole of the account of this third and fateful voyage, which shortly directed the gaze of British people toward the North Pacific coast of America, the pages carry a succession of items referring to seeds, plants, and domestic animals. Anchoring at King George's Sound, or Nootka, in Friendly Cove, the navigators made necessary repairs to their vessels, the "Discovery," and the "Resolution," and at the same time carried on some trade with the natives. Then under the Captain's direction the sailors harvested sufficient hay for the live stock that had survived the voyage. Captain Cook, writing of his experiences on the west coast of Vancouver Island in April, 1778, has this to say with reference to the first harvest of a local forage-crop of which we have any written record:—

"Captain Clerke and I went in the forenoon with two boats to the village at the west point of the Sound. When I was there the day before, I had observed that plenty of grass grew near it, and it was necessary to lay in a quantity of this as food for the few goats and sheep which were still left on board. The inhabitants received us with the same demonstrations of friendship which I had experienced before; and at the moment we landed, I ordered some of my people to begin their operation of cutting. I had not the least imagination that the natives could make any objection to our furnishing ourselves with what seemed to be of no use to them, but was necessary for us. However, I was mistaken, for the moment that our men began to cut, some of the inhabitants interposed and would not permit them to proceed, saying they must '*makook*'; that is, must first buy it. I was now in one of the houses, but as soon as I heard of this, I went to the field, where I found about a dozen of the natives, each of whom laid claim to some part of the grass that grew in this place. I bargained with them for it, and having completed the purchase, thought we were now at liberty to cut wherever we pleased; but here, again, it appeared that I was under a mistake, for the liberal manner in which I had paid the first pretended proprietors brought fresh demands upon me from others so that there did not seem to be a single blade of grass that had not a separate owner; and so many of them were to be satisfied, that I very soon emptied my pockets. When they found that I really had nothing more to give, their importunities ceased, and we were permitted to cut wherever we pleased, and as much as we chose to carry away."

Apparently Captain Cook was quite unaware of the fact that certain areas on the West Coast, from which the natives harvested perennial-clover roots (*Trifolium fimbriatum*), were regarded by them as hereditary properties which remained within the tribe or family. His experience in purchasing a crop of hay would indicate that his sailors may have been attempting to cut the crop from one of these "hereditary gardens." In referring to the natives of that place and to their lack of information regarding domestic animals, such as he carried on board his ships, Captain Cook further states:—

"Hogs, dogs, and goats have not as yet found their way to this place. Nor do the natives seem to have any knowledge of our brown rats, to which, when they saw one on board the ships, they applied the name they give to squirrels. And though they called our goats *eineetla*, this most probably, is their name for a young deer or fawn."

Of considerable interest are these statements from the pen of the great navigator, who not only introduced seeds, plants, and domestic animals into many of the communities he visited but who worked out a diet for his men that enabled them to accomplish their long ocean voyages without illness and the deaths that had been common on former similar expeditions. When Captain Cook visited the islands of the North Pacific coast in 1778 he was then the holder of Sir Godfrey Copley's gold medal, awarded to him for his paper read before the Royal Society. In that paper he outlined his methods of safe-guarding the lives of men, for long periods at sea, by including in their rations hops, malt, sauerkraut, as well as soups and vegetables that could be carried long distances without danger of spoilage.

Ten years after the arrival of Captain Cook at Nootka there was considerable activity along the North Pacific coast, where Russians, Spaniards, Americans, and British seafarers were participating in the maritime fur-trade. This year marks the 150 anniversary of the launching of the "Northwest America," the first ship built on the North Pacific coast after the arrival of the British explorers. Incidentally, Oriental craftsmen were engaged in the building of this ship and these Orientals, brought across the Pacific by Captain John Meares, were the first Chinese residents of Vancouver Island of whom we have authentic

record. Many of the place-names along the British Columbia coast perpetuate the names of the navigators who visited these shores 150 years ago.

The Lower Fraser River Valley was opened 130 years ago when Simon Fraser followed the river from the confluence of the Nechako to the Strait of Georgia and returned safely to Stuart Lake in New Caledonia in the summer of 1808.* The valley of the Lower Fraser River is now the source of more than half of the annual agricultural wealth of the Province, yet prior to 1858 there was no agricultural industry in that rich area, except for the Hudson's Bay Company's establishment at Langley.†

During the thirty years between 1828 and 1858, the Langley farm produced annual yields of farm crops and gave its returns of live stock for the sustenance of the Company's servants and for trade with the Russians in Alaska. It was following the discovery of gold in the bars of the Fraser River that a multitude of miners and adventurers came into this region in the summer of 1858 with the intention of working gravel-deposits that were believed to be rich in precious metals. Transportation costs were high and food was expensive. The success of the farming venture of the Hudson's Bay Company at Langley indicated the possibilities of agriculture along the river-banks, and even before the law governing the disposal of Crown lands was proclaimed by Governor Douglas application had been made by W. K. Squires for the right to purchase 100 acres of land for farm purposes on an island in the Fraser River near the trading-post at Hope. This right of purchase was granted by Richard Hicks, Commissioner of Crown lands at Yale, just eighty years ago. The right was in the nature of a lease.

Students of history may not be in agreement as to the accuracy of statements made regarding pioneer settlers and early land recordings, but the names of a few individuals stand out pre-eminently above the others in the story of farming in the Lower Fraser Valley; also the priority of community settlement may be open to question, but some of the well-developed farming areas of this valley have acquired an enviable place in the history of agriculture in the Province. These communities and these individuals may not have been first in point of time, but they have been well to the fore in point of importance.

Memorial to Tobacco-grower.

Food prices were high in the gold-rush days and sometimes the necessities of life were difficult to secure at any price. This condition extended to the luxuries as well, and there was a great dearth of tobacco along the Fraser River Canyon and up through the Cariboo between 1858 and 1868; consequently, the production and processing of tobacco offered an opportunity of which one enterprising individual took advantage. It was to mark the grave of this individual, Jonathan Hoiten Scott, that a fitting memorial was unveiled on the Sugarloaf Hill, on the Fraser River highlands east of Lillooet, on November 11th this year. This monument, though belated, recognizes the services rendered by the pioneer tobacco producer to the placer-miners of seventy-five years ago. The tablet was provided by the British Columbia Department of Agriculture.

J. H. Scott was born in Winchester County, New York State, in 1805. He travelled and lived in some of the southern tobacco-growing States and finally settled on land adjoining property of the Hudson's Bay Company at Fort Behrens about eighty years ago. Apparently he neither applied for nor secured title to the land on which he produced and processed the first tobacco commercially grown on British Columbia's mainland.

The property in question is situated on the second bench east of the Fraser River, opposite the town of Lillooet. For many years the place was known as "Parsonville," named for Ottis Parsons, who, with his partner, Nelson by name, operated a freight forwarding depot at that place in the hectic days of the placer-mining excitement in Cariboo.

Parsons and his partner prospered in the freight forwarding enterprise, and later on the business included the water transportation of freight and passengers on the Fraser River. Parsons sold out his Fraser River steamer holdings and with $40,000 set out for San Francisco on the ill-fated voyage of the steamer "Pacific." He and his wife and child

* Two years previously Fraser had given the name "New Caledonia" to that vast tract of land lying between the Coast Range and the Rocky Mountains, from 51° 30′ N. to 57° of latitude north.

† The country now known as British Columbia was named in 1858—the year that the mainland was made a Crown Colony.

were drowned, along with many others, when the Pacific went down after colliding with the "North Pacific" off Cape Flattery in November, 1875.

J. H. Scott never severed his connection with the Lillooet District after locating there some time prior to 1860. He found that the land was fertile and that with a little water he could produce the finest of leaf tobacco. He was an experienced tobacco grower and processor and he not only produced fine leaf but he aged and treated it in the excavated basement which may still be seen near the north boundary of Lot 704, Group 1, Lillooet. His tobacco found a ready sale and brought pleasure and comfort to the miners, whose opportunities for relaxation and enjoyment were limited enough.

Title to the site of Parsonville was never secured either by Parsons or his partner, and it is believed that several annual crops of tobacco were harvested by J. H. Scott before any thought was given to the securing of a title. It was on November 9th, 1863, that Lot 704, Group 1, comprising 168 acres in the Lillooet District, was acquired under Pre-emption Record No. 148 by Alexander Kennedy. He transferred the property to J. H. Scott the following year.

Twenty-one years later the administrators of Scott's estate disposed of Lot 704 to Gerald Dester, and the Crown grant was issued to his widow, Mary C. Dester, on December 18th, 1912.

At the unveiling of the monument at Parsonville, George M. Murray, M.L.A., spoke of the contribution of Jonathan Hoiten Scott in part, as follows:—

"Following a hard day on the trail or the gravel workings, there was solace in a pipe of this fragrant Lillooet leaf. Through its mellow haze camp rivalries were forgotten and old feuds dissolved.

"Some saw through the kindly fog the distant Hebrides, others the leafy lanes of Old England, and still others the good little people dancing over the bogs of Donegal. Southerners recalled cotton fields and manor houses of the southland as they smoked, the Californian had visions of adobe houses and orange groves, the Mexican as he rested his mule team on the road rolled a smoke from the local blended mixture and back to his memory came the sound of soft guitars in far-off Mexico, Chinese with heavy poke of gold from Cayoosh Creek exchanged some of it with Scott for one of the few luxuries the son of Ham permitted himself in this western land.

"But we do not raise this monument to Jonathan Hoiten Scott because tobacco alone was his product, rather we do so as an honour to all our pioneers of the Lillooet country. Some raised cattle and some grew cereals or fruit, but to this man from the south the growing of leaf tobacco came as second nature.

"Here at Lillooet were sunny skies like those of old Virginia, here was fertile soil and water, here one of that gallant company of first settlers took up the hoe and made the bench lands smile a harvest.

"We honour him to-day, fifty-eight years after his death, because he helped to lay the foundations of industry and commerce on the Pacific slope of British North America."

The last resting-place of Jonathan Hoiten Scott is on the little Sugarloaf Hill at the western edge of the Parsonville Plain where a 7-ton granite boulder bears a bronze tablet engraved as follows:—

JONATHAN HOITEN SCOTT
Born, Winchester Co., New York,
1805
Died Lillooet, B.C., Oct. 18, 1882.
Grew and processed first tobacco on mainland of British Columbia
between 1858 and 1864 and sold his product to miners
during the first Cariboo gold-rush.

CHILLIWACK AND DISTRICT.

Descendants of the pioneers are still farming in the vicinity of Chilliwack, Sardis, Sumas Prairie, Maple Ridge, Matsqui, and Langley, where their pioneer forbears cleared the land and gathered their harvests in 1863. The memories of members of the second generation are now none too clear on the events of seventy-five years ago, but it is generally conceded that the Chadsey brothers, after acquiring property on Sumas Prairie from David W. Miller,

who travelled all the way to Oregon and back in the early months of 1863 to bring live stock, seeds, and farm implements into the settlement, were leaders in agricultural progress. They showed great initiative in their farming operations, and in 1868 they were pressed for an outlet for their dairy butter, hundreds of pounds of which were ready for disposal. No local market adequate to care for their product was available so they loaded 2,500 lb. of it in a wagon and with ox teams they set out for the distant town of Barkerville in search of a market. The Fraser Canyon Highway leading to the Cariboo Trail had been opened for traffic about five years before and by that route their slow-moving oxen, with the heavy cargo of butter, travelled the 480 miles to Barkerville. Although the slow, long trip was made in the heat of summer the butter was so well packed in its sealed containers that it arrived in good condition, and it was retailed to the miners at a new low price for the Cariboo goldfields. The following year one of the prominent merchants of Barkerville was offering for sale 3 tons of Sumas butter at $1 a pound. Advantage was taken of this outlet, and the experiment of 1868 was followed by further shipments in the ensuing years.

Agriculture was showing remarkable development throughout the whole of the Lower Fraser Valley sixty-five years ago, and 1873 was an anniversary year in a number of settlements, but particularly in the Chilliwack area. The municipalities of Langley and Chilliwack were both incorporated in 1873, the year in which the Chadsey brothers erected on the Sumas Prairie the first grist-mill which several years later was moved to Chilliwack.

Agriculture of Interior Valleys.

Although fur brigades had been passing from New Caledonia down through the Cariboo and the Okanagan; thence by way of the Columbia to Fort Vancouver, and return, for several decades, it was not until 1858 that any particular notice was taken of the agricultural possibilities of the Okanagan Valley. In that year Joel Palmer reached the Thompson River with wagons and oxen, following the trail of the hundreds of miners on their way to the goldfields with pack-horses. It was about the same time that priests came in from the south, settled on the east shore of the Okanagan Lake, established a mission, planted gardens and fruit-trees, and brought the first honey-bees to British Columbia. Their apicultural attempt was not commercially successful, but the region traversed by the miners in 1858 and visited by the priests became the centre of the great beef-raising industry within a very few years. A band of 127 cattle were brought in from Oregon by the late Thomas Ellis, three-quarters of a century ago, and in the vicinity of Skaha Lake he began producing beef for the Cariboo market. From this beginning the cattle industry spread west and north and became one of the leading agricultural undertakings in the Southern Interior during the latter part of the 19th century.

Farming and Gold-mining.

The rush of gold-miners to the Fraser River bars gave agriculture its first impetus on the British Columbia mainland eighty years ago. Since that time there have been cycles of prosperity and depression in our rural settlements, but general experience indicates that increased activity in prospecting and gold-mining is ordinarily followed by better times for the farmer. One of the incentives for agricultural development in some of our interior areas was the overland trek of the miners to the goldfields of the Yukon forty years ago. Not only did the Yukon provide a new market for farm commodities produced in the most convenient farming settlements, but in passing through the country men on their way to the Yukon saw undeveloped lands with possibilities for agricultural development. Some of these lands were in the Nechako and Bulkley Valleys, where farming was almost negligible until about the beginning of the present century. At that time men were returning from the north, where they had gone either in search of gold, in conducting pack-trains, or driving beef cattle to the mining regions for slaughter, and engaged in the less spectacular but more substantial pursuit of farming. General experience in British Columbia is that the search for gold has drawn attention to the agricultural possibilities of new areas suitable for settlement, while the recovery of the precious metal greatly strengthens the market for local produce. This year gold production is high and prospects for continued prosperity of some of the mines are good. Consequently the agricultural outlook in many of our farming districts is hopeful. Naturally, world market conditions and world prices have a wide

influence on agriculture here as elsewhere, but prospecting and mining provide a local stimulus. Mining and farming go hand in hand and continue to prosper in British Columbia.

Venerable Agricultural Associations.

Two Agricultural Associations on Vancouver Island have celebrated their 70th anniversaries in 1938. These are the Cowichan Agricultural Society and North and South Saanich Agricultural Society. Both of these organizations have this year celebrated seventy years of continuous activity.

The Cowichan Agricultural Society is an outgrowth of a harvest festival and thanksgiving service that was held in the Duncan District in the fall of 1868, and its record of achievement is one of which the residents of the Cowichan District are justly proud.

The first humble fair held by the North and South Saanich Agricultural Society was staged in the wagon-shed of one of the pioneers on Saanich Peninsula in the fall of 1868, and among the directors of the Society this year there are descendants of those pioneers.

Various occurrences referred to in Canadian and American histories had a bearing on the development of agriculture on Saanich Peninsula. Even the Cayuse War of 1848, which forced the use of the Fraser River route to the Interior by way of Hope in place of the Columbia River route, stimulated agricultural production on southern Vancouver Island as well as at Fort Langley.

Books of the North and South Saanich Agricultural Society, now preserved in the Provincial Archives in Victoria, contain accounts of the activities of the early settlers on the Peninsula extending back to the days when the Hudson's Bay Company held a part of the Alaskan Territory under lease from the Russians. These books show how money was raised for prize awards and for community developments, and throughout their pages run consecutive accounts of the activities of the farmers of this district, which is now largely devoted to extensive production along specialized agricultural lines.

Department of Agriculture.

It was in 1873 that the portfolio of Agriculture was included with that of the Minister of Finance for British Columbia, but it was not until fifteen years later that the dual departments published any document of an official nature dealing directly with an agricultural subject. Careful search indicates that the report of the Honorary Entomologist printed in 1888 has the distinction of being the first official document issued by this Department. This places entomology in an enviable position with reference to agricultural activities in the Province.

It is admitted that for several years prior to the publication of the report of the Honorary Entomologist a series of reports dealing with immigration, and known as the " Annual Report of the Immigration Agent, British Columbia," were submitted to the Minister of Finance and Agriculture, but as these reports were not concerned with agricultural problems they are mentioned only by reason of passing interest. Although the British Columbia Department of Agriculture is this year observing its sixty-fifth anniversary, it was not until 1891 that the first permanent official was appointed to the Agricultural Branch. This officer, known as the Statistician, before adopting any definite plans in furthering agriculture decided that the first step necessary was to become acquainted with farming problems as they existed at that time. With this in view fifty-four correspondents were enrolled to collect information on conditions existing in their immediate districts and to forward their findings to the Statistician. Apparently this official considered that the data collected in this manner were far from satisfactory, but they formed the basis of the first report of the Department of Agriculture which was printed in 1892.

Forty-five years ago the second annual report of the Department was issued in 1893 and, except for a span of several years at the end of the 19th and early part of the 20th century when funds were difficult to secure for printing of reports, the series has been continued to date and it constitutes a valuable record of agricultural progress year by year. During the last twenty-five years the report of the departmental Statistician has been issued annually as a separate publication. By reference to the statistics reports and by a careful examination of records of agricultural production during the years in which farming has been an industry of commercial importance, it is indicated that the wealth produced on the farms of this

Province in the past forty years is $1,268,097,661. But more important than the value of the production of the soil is the fact that our farms remain productive and the annual yielding-up of agricultural wealth has not depleted the source from which that wealth was obtained.

In 1893 the Department of Agriculture issued the first of a long series of bulletins, and year by year additional publications have been issued. These are made available free to residents of the Province upon request, and are available to those outside the Province upon request and upon payment of a nominal charge.

It was in 1894 that the British Columbia Legislature passed an Act creating a separate and distinct Department of Agriculture, and immediately following this passage the Statistician became the first Deputy Minister. With a small resident staff he directed the activities of the Department and continued to report to the Minister, who still retained the dual portfolio of Finance and Agriculture.

The Department's activities were extended considerably in 1909, when the Legislature made provision for the formation of several branches, including the Horticultural Branch, Live Stock Branch, Dairy Branch, Poultry Branch, and Farmers' Institutes Branch. Already the Farmers' Institute organization had been actively progressing for a dozen years. A brief reference to its history was made on page K 8 of the thirty-second annual report of the Department in 1937.

A direct result of the reorganization of the Department was the publication of a series of branch circulars in 1912. These several branch circulars published in that year have been added to, with originals reissued in the ensuing years. Each year the requests for publications become increasingly numerous, and for 1938 the number of departmental publications distributed is 39,947. The detailed list will be found further on in this report.

It was in 1912 that a Royal Commission was appointed to inquire into conditions affecting agriculture in British Columbia, and the report submitted by the Commission to the Government two years later recommended a separate portfolio of Agriculture divorced from the Department of Finance. In 1916 the Legislature, following the recommendations of the Commission, passed the necessary legislation creating a new Department and a separate portfolio in the Cabinet, with the Honourable John Oliver as Minister in charge. Since that time there have been a number of changes in the Department set-up which now includes four divisions—namely, Administrative, Animal Industry, Plant Industry, and Markets.

PUBLICATIONS.

During the year 1938 publications distributed amounted to 39,947 copies, being an increase of 4,070 copies over the previous year, according to L. W. Johnson, senior clerk, who presents the following list of the publications printed during the year:—

Starters for Farm Cheese-making	Dairy Circ. No. 1.
Certified Milk and Butter-fat Records, 1937	Dairy Circ. No. 34.
Seventh List of Dairy Sires	Dairy Circ. No. 35.
Strawberry-root Weevil	Hort. Circ. No. 33.
Alfalfa-growing for Feed	Field Crops Circ. No. 16.
Gardening on a City Lot	Hort. Circ. No. 43.
Loganberry Culture	Hort. Circ. No. 54.
Pruning Fruit-trees	Hort. Circ. No. 60.
Swine-raising in B.C.	Bulletin No. 60.
Practical Poultry-feeding	Bulletin No. 107.
Bee Culture in B.C.	Bulletin No. 92.
Use of Water in Irrigation	Agr. Dept. Circ. No. 47.
List of Publications.	
Preservation of Food	Bulletin No. 83.
Agricultural Statistics, 1937.	
Climate of British Columbia.	
Annual Report of the Department, 1937.	

BOYS' AND GIRLS' CLUBS.

In reporting on the activities of boys and girls engaged in junior club projects this year, Mr. S. S. Phillips, the Club Secretary, states that club work in varying forms has been carried on for many years by the Extension Service in the several Provinces. The reports of the Department of Agriculture during the past twenty-five years contain successive references to club projects in this Province which were instituted by the Department of Agriculture in 1913.

Although club work has been recognized as a departmental undertaking for only twenty-five years, the actual participation by boys and girls in live-stock projects extends back to colonial days on the North Pacific coast. Even before the Hudson's Bay Company's post was established at Fort Victoria, at a time when settlements were few and population was small, the responsible officers of the Trading Company not only showed a desire to have the young people engage in live-stock projects but left records to indicate that facilities were placed at the disposal of boys and girls to enable them to engage in live-stock husbandry.

As an example of one of these references in the old records the following excerpt from a letter written by Chief Factor John McLoughlin to Angus MacDonald, dated Cowlitz, April 29th, 1842, reads, "you will let Archibald Spencer's eldest daughter have the loan of a tame cow to milk for herself, and if there is any other girl who can milk let each of them have a tame cow to milk for herself."

Between 1842 and 1913 there were many examples of local or community enterprise with reference to the participation by boys and girls in live-stock projects, but the above-mentioned quotation would indicate that the girls of the early days were leaders in this movement.

The Secretary in reporting matters of interest to club members for the current year points out that the national contest held this year at the Royal Winter Fair, Toronto, is the fifteenth interprovincial competition that has been open to teams from different parts of Canada since the first contest was instituted in 1924. It is also noted that Dr. W. J. Black, who was instrumental in bringing about the national club contest, has this year retired from his post as Commissioner of the Department of Colonization and Agriculture of the Canadian National Railways at Montreal. That Dr. Black was successful in his efforts in behalf of boys' and girls' club work in Canada is evident in the present status of this Dominion-wide activity and in the comprehensive programme developed by the Canadian Council on Boys' and Girls' Club Work.

The active assistance rendered by the Canadian National Railways and the Canadian Pacific Railway in connection with the holding of the national contest at Toronto each fall is a vital factor in maintaining the interest of boys and girls in their club work. The educational value of the Toronto trip is recognized by all competitors, and the possibility of qualifying for competition at Toronto is sufficient incentive to keep many boys and girls keenly interested in their work from year to year.

The Secretary for Boys' and Girls' Club Work in this Province presents the following list which shows the projects for 1937 and 1938; a satisfactory increase is indicated by comparing the number of projects and membership for the two years.

Project.	1937.		1938.	
	Clubs.	Membership.	Clubs.	Membership.
Dairy calf	26	293	25	271
Beef calf	8	87	7	74
Swine	11	98	11	93
Sheep	---	-----	1	14
Poultry, baby chick	---	-----	33	311
Poultry, eggs	34	316	18	180
Potato	15	128	15	179
Grain	1	7	1	10
Seed-growing	---	-----	1	13

The above table shows big increases in the poultry, baby chick, and potato clubs. Two new projects were started this year, a sheep club and seed-growing project.

The 1938 regulations are quite satisfactory and it would appear that no revision is necessary. Practically all the clubs received their prize-money before Christmas this year. There were a few exceptions in cases where the district organizers failed to notify this office of the final standing of the clubs.

Junior Activities, Class A and B Exhibitions.

The following shows the number of club members who competed in special junior events featured by the exhibitions:—

Vancouver Exhibition—	Entries.
Junior stock-judging	39
Live-stock judging teams (three members each)	8
Senior stock-judging	5

In addition to the above about ninety members competed in the calf showmanship and rope halter-making contests.

Victoria Exhibition—	Entries.
Junior stock-judging contest	11
Intermediate stock-judging contest	5
Senior stock-judging contest	7

Club members also competed in the calf showmanship and rope halter-making contest at this exhibition.

Armstrong Exhibition—	Entries.
Senior dairy-judging contest	5
Junior dairy-judging contest	8
Senior swine-judging contest	5
Junior swine-judging contest	8
Chilliwack Exhibition—	
Horse-judging competition	24
Showmanship, junior contest	21
Showmanship, intermediate contest	14
Showmanship, senior contest	7
Swine-judging contest	22
Dairy cattle judging contest	33

Tabulated results showing the winners and scores made by competitors are on file in this office.

Preliminary Judging Contest at Vancouver.

Dairy contest winners: Lloyd Tranmer, Chilliwack, and Allan Keenlyside, Chilliwack.
(Five teams competed in this contest.)

Final Elimination Contest at Armstrong.

Dairy contest winners: Lloyd Tranmer, Chilliwack, and Allan Keenlyside, Chilliwack.
Swine contest winners: Percy Olley, Chilliwack, and Roy Annis, Chilliwack.
Potato-judging contest: Billy Ebbs, Steveston, and Douglas Gilmore, Steveston.
(Four teams competed in this contest, which was held during Vancouver exhibition.)
Beef cattle contest winners: Douglas Lyons, Vinsulla, and Elmore McMorran, Kamloops.
(Three teams competed in this contest which was held during the Kamloops exhibition.)
The tabulated results showing the scores for judging classes, reasons and oral examination, are on file in this office.

National Competitions, Royal Winter Fair, Toronto.

The British Columbia teams again made a splendid showing in the national contests.

Project.	Contestant's Name.	Team Score.	Placing.
Potato	William Ebbs Douglas Gilmore	1,082	1
Dairy	Allan Keenlyside Lloyd Tranmer	843	2
Swine	Roy Annis Percy Olley	818	5
Beef	Douglas Lyons Elmore McMorran	865	5

Premier Award to Potato Team.

It is very gratifying that a British Columbia potato team again took first place in this project this year. First place was also held by a British Columbia team last year. The dairy team also made a splendid showing, taking second place. The swine team secured fifth place, but there was less than 100 points difference in the team score between the British Columbia team and the team taking the first place. There was a difference of only 106 points between our beef team and the team taking first place, showing that competition was keen in these projects.

Junior Judges at Toronto.

On his return from accompanying the eight British Columbia Junior Club contestants to Toronto Royal Winter Fair, R. G. Sutton, District Agriculturist for the Lower Mainland, presented a report of the trip and the contest. This report, which has been multigraphed and distributed among Farmers' Institutes and club secretaries and organizers, reads, in part, as follows:—

"While the potato team won by only one point, their score was the highest scored by any team in the whole contest, with 1,082 out of a possible 1,200. Douglas Gilmore, one member of the team, tied for highest individual score with an Ontario boy, with 549 points out of a possible 600. This is the second year in which our Province has taken premier place in potato-judging.

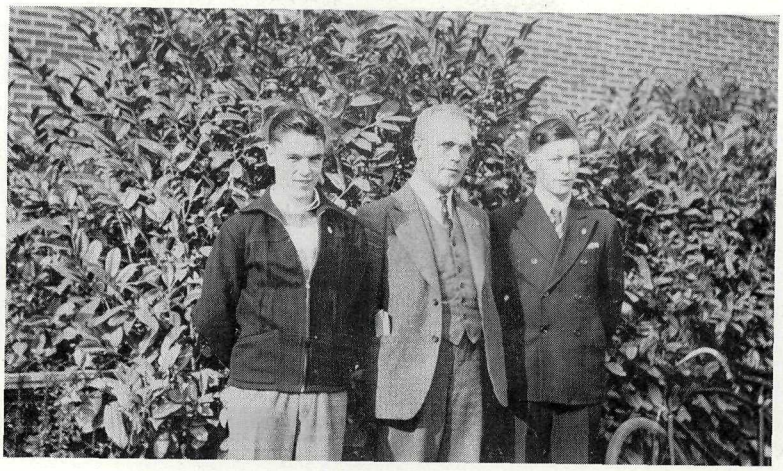
"Our dairy team dropped back a little from what I expected and lost points in their placings. They only placed one class correctly between them. However, one boy was only 15 points ahead of his team mate, which indicates good uniformity in their work. They stood second in the contest, but were 23 points behind the winning team. They did their best work in the oral examination. I was very pleased to see them take second place, as that is no mean award in that contest.

"In the beef contest the boys did excellent work in their judging, but dropped back in the oral work. One boy's individual score was third highest in the contest, but there was a difference of 105 points between the individual scores of the two members.

"The swine team did very well in placing their classes, but went down in oral work. One boy took too long answering the first few questions and he had to miss the last two completely. The other boy had the fifth highest individual score. In the dairy contest there were seven teams; swine, seven teams; beef, five teams; poultry, five teams; potatoes, four; and seed-grain, four.

"One point worthy of note is that the chairman mentioned that the most polite team they had encountered for many years was the British Columbia beef team. He also stated that the judges were glad to note that none of the contestants chewed gum during the contest. Both the Cattle and Swine Committees heartily endorsed the action of the secretary in arranging for all the oral work of the contest to be done in the hotel.

"At the meeting for the election of officers, Mr. Stanley Wood, of New Brunswick, formerly vice-president, moved up as president, and Mr. J. B. Munro, of British Columbia, was elected vice-president. Mr. A. E. MacLaurin continues as general secretary."



Left to right: Douglas Gilmore; H. S. McLeod, B.S.A., Inspector, Dominion Department of Agriculture; and Billie Ebbs.

The two boys in the picture above with Mr. McLeod were the team sent to Toronto from British Columbia in 1938. They were winners of first prize in the Potato-judging Contest.

Left to right: Robert Hazlett; R. G. Sutton, B.S.A., District Agriculturist, New Westminster; and Ray Green.

The two boys shown with Mr. Sutton were the 1937 Potato-judging Champions at the Toronto Royal Winter Fair.

The above shows the group of junior potato-growers of Richmond, and guests, at the field-day held July 20th, 1938.

IMPORTED HORTICULTURAL PRODUCTS.

With the approval of the District Inspector in charge, a brief summarized report of the activities of the Vancouver office, Federal Department of Agriculture, has been supplied by Mr. A. J. Fuller, covering imported nursery stock and plant product interceptions.

In June the European pine-shoot moth was found infesting trees in the South Granville area. The June beetle *Phyllophaga decemlineata* was abundant in gardens, and the satin moth was conspicuous along the banks of the Fraser River, between Vancouver and New Westminster. Approximately 2,000,000 ladybird beetles from California were released in the Fraser Valley to combat infestations of the pea-aphis.

An interesting item in connection with nursery stock is the exporting of Maglio plum-trees. This is a very sturdy tree and a creation by Signor Carmine Maglio, an Italian fruit-grower at Nelson.

Since the last report on the imported iris-bulb situation, *Ditylenchus dipsaci* has been found infesting both the English and Spanish species in addition to the Dutch, causing grave concern to the Division.

Japanese bulbs arrived in excellent shape, none being condemned.

Particulars of imported plant products have been extracted from our recording books by Mr. Geo. H. Stewart, Provincial Agricultural Statistician, and, therefore, will not appear in this report.

Shipping News.

During the year 2,213 deep-sea and coastwise boats docked at Vancouver. Sixty-six brought nursery stock and 497 had 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 the cargo boats.

Imported Nursery Stock.

Assorted fruit-trees, ornamental shrubs, and plants, numbering 2,983,077, in 3,675 containers, valued at $75,959.62, were inspected in Vancouver and district and are listed under the following headings:—

Assorted fruit-trees	62,117
Assorted small fruits	131,198
Assorted ornamental shrubs	34,703
Roses	20,243
Fruit seedlings	220,182
Ornamental seedlings	8,773
Plants	42,907
Roots	115,494
Assorted bulbs	2,341,827
Assorted bulbs	2 bu. 5 qt.
Scions (various)	5,533
Peach pits (lb.)	5,360

The countries of origin being chiefly the British Isles, Europe, New Zealand, Australia, Japan, and the United States of America.

Interprovincial Nursery Stock.

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

Assorted fruit-trees	200
Assorted small fruits	9,473
Assorted ornamental shrubs	825
Rose-bushes	925
Fruit-tree seedlings	4
Assorted plants	2,290
Assorted roots	3,895
Assorted bulbs	39,187
Scions	100

Three hundred and seventy-five shipments, the contents of 442 containers, were inspected, the total value of the stock being $3,139.96. Although there were a few more importations than last year, the quantity of plants brought in was considerably less.

Nursery stock imported into British Columbia from Manitoba and points west is taken care of by Mr. J. W. Eastham and Mr. Walter Sandall.

Interceptions.

Grape-vines condemned for *Phylloxera vastatrix*	34
Iris bulbs condemned for *Ditylenchus dipsaci*	84
Gladioli bulbs condemned for hard rot and scab	9

Intercepted Nursery Stock from Foreign Countries.

Assorted fruit-trees condemned for San Jose, *Diaspis forbesi* and *Aspidiotus* sp. scale, woolly aphis, bud-mite, anthracnose, root-gall, crown-rot, hairy root, pear root-aphis, gummosis, and sour sap	434
Grape-vines for *Phylloxera vastatrix*	144
Fruit scions for *Aspidiotus* scale	13
Assorted ornamental trees and shrubs for *Diaspis forbesi*, oyster-shell, *Diaspis carueli, chionaspis*, and *Lecanium* scale insects, juniper aphis and *Gymnosporangium juniperi* (cedar apple rust)	202
Begonias and gloxinias for *Fusarium* rot	146
Assorted bulbs for narcissus bulb fly, *Ditylenchus dipsaci*, mites, *Botrytis, Penicillium* mould, dry, hard, basal, chalk, soft, and wet rot, hyacinth yellows, *Rhizopus necans*, and ink-spot disease	10,196

Intercepted Plant Products.

Although only ten boxes of peaches were actually condemned, numerous shipments of plant products such as rice, beans, dried fruits, and nuts were found infested with various stored product insects. These are subject to fumigation and, after a second inspection, released.

EXPORTED NURSERY STOCK.

In Appendix II. will be found detailed information regarding nursery stock exported and the names of the several countries to which shipments were addressed.

Exported Plant Products.

The following table shows the plant products exported from British Columbia through the ports of Vancouver and New Westminster which were covered by certificates of inspection. It does not cover all the fruit and vegetables exported from this Province. The countries to which these certified products were forwarded are as follows: Belgium, Brazil, British Isles, British West Indies, China, Egypt, Fiji Islands, France, Germany, Malay States, New Zealand, Philippine Islands, and South Africa.

Plant Product.	Containers.	Value.
Apples	1,327,099 boxes	$1,987,118.73
Pears	8 „	18.00
Plums	5 „	5.50
Carrots	50 sacks	45.00
Celery	14 crates	30.20
Onions	42,261 sacks	64,660.80
Parsnips	70 „	97.50
Potatoes	29,377 „	17,922.06
Turnips	155 „	158.25
Wheat	42 „	60.88
Hay	52 trusses	50.00

FARMERS' INSTITUTES.

Through favourable arrangements announced by the Secretary of the British Columbia Chamber of Agriculture upwards of fifty Farmers' Institutes in this Province have secured membership and representation in the Chamber of Agriculture, which is affiliated with the Canadian organization. There has been close co-operation between the secretaries of Farmers' Institutes and the Secretary of the British Columbia Chamber of Agriculture, to the mutual advantage of both organizations.

During the present year the farmers' organizations have continued to promote the interests of their members, and the Farmers' Institutes have taken the lead in many beneficial activities in all parts of the Province. Pure-bred sire purchases have maintained a satisfactory level, and accounts that have been in arrears for pure-bred sire payments are now paid up in full in almost every instance.

District Conferences.

In all ten Farmers' Institute district annual conventions have been held. The Minister of Agriculture and the Superintendent of Farmers' Institutes have been in attendance at the majority of these conferences, where resolutions from locals were considered before being endorsed for reference to the Advisory Board, or returned to the locals as unsuitable for presentation.

At the District " G " Farmers' Institute conference held at Armstrong, B.C., the delegates had an opportunity of hearing Mr. R. W. Haddon, managing director of the " Farmer and Stockbreeder," when he was returning from Sydney. Mr. Haddon gave a very concise report on agricultural conditions in Britain and the probable outcome of the Empire Conference in Australia.

The Advisory Board of Farmers' Institutes met at Victoria in November and dealt with 127 resolutions which were submitted for their consideration. The Board also met the Select Standing Committee on Agriculture of the British Columbia Legislature, and discussed with the Committee several of the more important resolutions requiring Legislative consideration.

In a number of instances Farmers' Institutes have shown a tendency to ignore their own by-laws and the departmental regulations, which have been established not only for the guidance but for the protection of the organization and its individual members. The secretaries of these Farmers' Institutes have been informed that the by-laws and regulations must be observed throughout the year if they are to prove a safeguard to members on occasions when the strict observance of rules and regulations is desired by those members. Individual letters have gone to Institute secretaries, informing them of the necessity of complying with rules, regulations, and by-laws in the matter of business transactions, the holding of general and annual meetings, the holding of elections, and the admission of individual members to membership.

The seedlings of British oak-trees that were planted at the time of the Coronation of Their Majesties King George VI. and Queen Elizabeth are reported by many of the Farmers' Institutes and Women's Institutes as having survived the winter and making satisfactory growth. Also fifty of the farmers' organizations to which British flags were presented upon their having built or acquired institute halls of their own are reported to have proved very acceptable in their several neighbourhoods. In some districts special flag-raising ceremonies were established both last year and this year on suitable occasions, when local settlers were present in large attendance. One of the most interesting of these flag-raising ceremonies took place in June at Woodpecker, on the occasion of the Farmers' Institute convention of District " C."

Institute Transactions.

In business transactions many Farmers' Institutes are increasing their services to their members, particularly in the purchase of fertilizers, seeds, stumping-powder, and farm machinery. Also a number of them are active in arranging for the assembling and disposal of the farm products of their members. The figures for 1938 are not available, but in the previous year, the last for which complete returns are available, approximately 122 Farmers' Institutes purchased seeds, feeds, and fertilizers to the value of $127,742.94, as compared with $122,943.10 for 1936 and $93,136.05 for 1935. This indicates an increase of 3.74 per cent. in co-operative purchases. Stumping-powder purchases exceeded $48,000 in 1938.

In the matter of sales of farm products several Farmers' Institutes made spectacular advance this year, and of particular note is the business turnover of the Revelstoke Farmers' Institute which has become a real force in that growing community.

Rodent-control.

Rodent-control has again required the purchase of large quantities of Cyanogas "A" dust. The Department has maintained its policy of rebating Farmers' Institutes to the extent of 50 per cent. of the cost of the material and transportation, as well as 50 per cent. of the delivery price of Cyanogas dust pumps. This enabled institute members to carry on their campaign against Columbia ground-squirrels, gophers, marmots, and other burrowing rodents at a cost that is within their reach. In addition to the use of Cyanogas this year, particularly in District "D," a number of Farmers' Institutes have experimented with the strychnine bait and they report that it has proved efficacious and economical.

Grasshopper-control.

In addition to the grasshopper work carried on by Control Committees, certain Farmers' Institutes have taken an active part in keeping a check over the spread of this insect pest. Grasshopper-control Areas have been established as follows:—

Nicola Grasshopper-control Area.
Clinton Grasshopper-control Area.
South Riske Creek Grasshopper-control Area.
Oliver-Osoyoos Grasshopper-control Area.
Kamloops Grasshopper-control Area.
Midway Grasshopper-control Area.
Rock Creek Grasshopper-control Area.
Princeton Grasshopper-control Area.

Outside of these areas there have been sporadic outbreaks where control has been effected through organized farmers securing small quantities of poisons and other ingredients for the compounding of baits that have been used as occasion requires.

It is interesting to note that in the compounding of grasshopper poison-baits this year apple pomace has been used by some of the grasshopper-control committees. This material is manufactured as a by-product from apple waste in the North Okanagan Valley and the general impression is that it attracts the grasshoppers by reason of its aroma, that it absorbs and holds the poison, and that it is consumed by grasshoppers in quantity sufficiently to cause their death.

CHAMBER OF AGRICULTURE.

No reference to the British Columbia Chamber of Agriculture was made in the report of this Department for the year 1937 as that organization was still in embryonic form, and reference to its early efforts at correlating the activities and attempts of farmers' organizations had been referred to in 1936. This year, however, it is possible to point to definite achievement on the part of the Chamber of Agriculture, which has worked in very close co-operation with local agricultural organizations and through the Canadian Chamber of Agriculture. It has maintained close contact with conferences and developments, national and international, which were aimed at the betterment of the agriculturist.

The Chamber of Agriculture has made available reports on the Empire Producers' Conference, which was held in Sydney, Australia, this year, and co-operated in arranging for delegates at that Conference to visit several of our agricultural areas in this Province when returning from the Conference. Sir Reginald Dorman-Smith, M.P., leader of the British delegation and a past president of the National Farmers' Union of England, visited British Columbia's Coast centres on his homeward trip and met with the Minister of Agriculture for this Province and with other farm leaders.

Other conferences which were particularly noted by the British Columbia Chamber of Agriculture were the International Wheat Conference held in Winnipeg in December, and the National Chemurgic Conference, which was organized in Toronto, in November. This latter organization indicates the possibility of establishing a partnership between research, business, finance, and agriculture with a view to developing means by which full advantage may be taken of the primary products of the soil. Its purpose is to find a process by which

surplus products and by-products may be turned into commercial use for the general benefit of both producers and consumers.

The British Columbia group was represented at the Western Agricultural Conference and the business transactions on that occasion were noted by the secretary, who made his observations available to the British Columbia members, including those Farmers' Institutes which have taken out group membership in the British Columbia Chamber of Agriculture.

This year there has been a decidedly close co-ordination of effort between the Chamber of Agriculture and the British Columbia Farmers' Institutes.

FEED-GRAIN IMPORTATIONS.

Under Tariff 145 of the Canadian Freight Association a total of 973 feed-grain certificates have been issued from the office of the Department of Agriculture, Court-house, Vancouver, B.C., during the year 1938. In addition to these reported to Mr. Walter Sandall, there were twenty-two certificates issued from the Victoria office, as compared with five issued in 1937. Of the number issued in Vancouver nine were cancelled for duplication or otherwise. This shows a substantial increase as against the 616 certificates issued during 1937.

These certificates enable the holders to secure the special reduced freight rate which is extended to specified grades of feed-grain, in bulk or in sacks. In July, 1938, milled feeds, such as bran, shorts, middlings, and feed flour, were also brought under the tariff.

During the past year several Feed Grain Certificates have been issued to Farmers' Institutes located on the Lower Mainland, but are mainly issued to dealers in stock and poultry feeds, who in turn are able to distribute to the consumers such benefits as are accrued from the reduced freight rates. All grain and milled-feed shipments covered by the special tariff have originated from various districts in the Province of Alberta and have been transported over Canadian Pacific and Canadian National Railways to British Columbia. Details of the feed-grain movements will be found in Appendix No. 1.

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 the Port of Vancouver during the year 1938 were submitted to the usual inspection upon arrival to ascertain that the requirements of the "Eggs Marks Act" had been complied with. Imported eggs and egg products entering the Port of Victoria are inspected and reported each month to the Chief Provincial Egg Inspector, Court-house, Vancouver, B.C., through the courtesy of Mr. John Noble, Federal District Inspector at that Port.

The arrivals reported during the year total as follows:—

Port of Victoria: 18 dozen eggs for hatching purposes from U.S.A. and 174 cases of salted eggs from China.

Port of Vancouver: 620 cases of salted eggs from China.

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

STAFF CHANGES.

There have been few changes in the staff of the Department during the current calendar year. Permanent appointments included, Thomas S. Crack, District Agriculturist for the Peace River Block at Pouce Coupe, appointed April 1st, 1938; and Miss Eva M. Campbell, stenographer, general office, Victoria, appointed December 1st, 1938. The resignation of Miss Violet M. Brakes was accepted, to take effect on November 30th; and the resignation of Miss M. McMillan of the District Office, Kamloops, was accepted, to take effect on December 31st, 1938.

Miss Jean E. Yorston, stenographer in the Williams Lake District Office, was transferred on August 1st, 1938, to the Finance Department, and her place has been temporarily filled by Miss Grace Smedley.

FARM SETTLEMENT INVESTIGATIONS.

Of passing interest is the visit paid to British Columbia in August of this year by Brigadier-General Sir Henry Page Croft, Bart., C.M.G., M.P., and Mr. R. S. Dalgleish, who on behalf of British interests investigated the possibilities of settlement of British immigrants

under a community plan. Sir Henry is chairman of the Empire Development and Settlement Research Committee; Mr. Dalgleish was convenor of the Empire Settlement Conference at Newcastle-on-Tyne in 1935 when Lord Mayor, and joint convenor of the Guildhall Conference in 1937.

PRESERVING FRESH VEGETABLES BY FREEZING.

In February your Deputy Minister, accompanied by the Provincial Horticulturist and the Deputy Minister of Trade and Industry, visited Tacoma and Sumner, Washington, to get first-hand information with reference to method of blanching and freezing fresh vegetables, which is reported to be giving satisfactory results in Washington and in some of the Eastern States.

In the report of the Provincial Horticulturist reference is made to the adoption of the blanching and freezing process in the preserving of peas, beans, corn, asparagus, and other vegetables at New Westminster and at Victoria. The local products which were blanched and frozen last summer are finding ready markets locally, and the quality of these products is satisfactory.

REPORT OF MARKETS BRANCH.

J. A. GRANT, COMMISSIONER.

The fruit and vegetable season of 1938 established many high records in production, chiefly in strawberries and peaches. There were increases all along the line. This was caused by favourable weather conditions and also by an increase in the producing acreage.

The purchasing-power of Prairie farmers was enhanced by a fair crop, and more earned money was available than there has been for several years resulting in increased buying of fruits. Early vegetable and potato shipments were not as heavy as usual owing to the late season in British Columbia and the fairly early Prairie season. This condition forced the maturing of their local vegetables and shut out British Columbia supplies.

PRIVY COUNCIL DECISION.

The outstanding event affecting marketing directly was the decision of the Privy Council upholding the "Natural Products Marketing (British Columbia) Act." The stability of this legislation has been threatened from time to time ever since the first Committee of Direction was set up by the Legislature in 1927. The decision given will have a far-reaching effect upon marketing throughout Canada, as it definitely establishes Provincial powers and points the way to Dominion co-operation in making for stability in marketing at every point in the Dominion. Since this judgment was handed down on July 27th, 1938, several votes have been taken on the continuance of marketing schemes. The Hothouse Tomato and Cucumber Marketing Scheme was voted on adversely and discontinued; the vote being 51 for and 77 against. The continuance of the "Milk Marketing Scheme of the Lower Mainland of British Columbia" was next voted on and sustained by a vote of 1,892 for and 335 against. The voting on the continuance of the "B.C. Coast Vegetable Scheme" followed, with 375 in favour to 170 against. Other votes may be taken at the request of producers from time to time.

FORCED RHUBARB.

The marketing season of 1938 commenced with forced rhubarb. In Vancouver the Chinese fruit-dealers who handle most of this product were uninterested, as the producers of this commodity are from 90 to 95 per cent. Japanese. There was no recognized organization handling the product, and looking from the outside it seemed that the few organized growers and independent growers took every possible step to ruin the deal, resulting in the lowest price on record for this commodity. The weather conditions were favourable to marketing, and Prairie shipments were better handled than in Vancouver, due to an arrangement made between Prairie brokers and the largest organized shipper.

Prairie shipments netted $1.40 per 40-lb. box.
Coast shipments netted 90 cents per 40-lb. box.
Amount shipped and sold on Prairie markets, 8,563 boxes.
Amount shipped and sold on Coast markets, 13,000 boxes.

HOTHOUSE TOMATOES AND CUCUMBERS.

The withdrawal of a seasonal tariff on hothouse tomatoes had a serious effect upon prices this year. The volume produced of the first crop was in excess of last year and importations of field-grown tomatoes from Mexico and Southern States had a " bear " effect on the market.

Tomatoes, first crop: Victoria produced and sold 191,384 crates; Vancouver produced and sold 35,853 crates.

Cucumbers: Victoria produced and sold 23,150 boxes; Vancouver produced and sold 7,251 boxes.

The second crop of tomatoes was about 10,000 crates less than last year and the price approximately 40 cents per crate lower. We were unable to secure correct figures owing to divided distribution.

FIELD RHUBARB.

Field rhubarb started rolling to market in car-lots on April 12th and finished May 23rd. The selling organization had the support of practically all the co-operative growers; Surrey growers being the exception, and they only shipped two cars. For several outstanding reasons the volume shipped in 1938 was far below normal. Mild weather on the Prairies forced on their home-grown product, cheap British Columbia apples and forced rhubarb, together with cheap imported grapefruit and oranges, all worked against a receptive opening of the market. Prices were low, starting with $1.25 f.o.b. per 40-lb. box. On April 25th this price was lowered to 90 cents and later to 65 and 50 cents. It was freely stated that the united efforts of the growers' organizations made these prices possible, and had the same methods prevailed as were used in selling the forced rhubarb growers would probably have only received the price of the boxes. Total field rhubarb shipped to Prairies in 1938, 35,118 boxes or sixty-five cars, averaging 74.28 cents per box.

STRAWBERRIES.

As previously noted, the volume of strawberries shipped to the Prairies was the greatest on record. The 1935 record of 153 cars was exceeded by forty-eight cars, making a total of 201 cars. Practically all organizations of berry-growers in the Province were united in shipping through one central agency to points beyond the Rockies. An experiment was made with jumble-pack berries, but this did not meet with the approval of buyers for the following reasons: (1) Sovereigns were too large for jumble-pack; (2) unfaced packs were not attractive; and (3) light weight. These factors injured distribution, and on June 11th orders were issued to return to the regular faced pack. The first car rolled to the Prairies on June 1st and the last on July 10th. For the first part of the season good weather prevailed, but from June 16th soft and mouldy berries were found in cars—due to high temperature and showery weather. Two cars were shipped to Eastern Canada and arrived in fairly good condition. Three cars were sent to the Prairies by freight and the balance shipped by express.

The bountiful production of strawberries in 1938 and the necessity of selling the major part on the fresh-fruit market upset all possibility of satisfactory returns, as despite any financial condition the Prairie Provinces have their consuming limitations. An unusual situation happened in the shape of a wire received by the distributers on June 29th. We quote it without comment: " Better count Manitoba out of strawberries next week as tremendous local crop coming on. This is no hooey." There were approximately 236,700 crates shipped, realizing an average of $1.33 per crate to shipper.

RASPBERRIES.

The raspberry is not as popular as the strawberry, and as they can be grown at many Prairie points and ripened almost as early as in British Columbia, there is little likelihood of profit by acreage increase. While the 1938 crop was twenty cars in excess of 1937 the prices realized were discouraging. The Lower Mainland shipped fifty-five cars and Wynndel one car. In all, 52,346 crates were shipped with an average to shipper of $1.51 per crate.

LATE BERRIES, INCLUDING EVERBEARING STRAWBERRIES.

In all forty-five cars of mixed berries were shipped. These berries arrived on the market at a time when consumers had a wide range of fruit to select from. Prices were fairly well

maintained in Saskatchewan and Manitoba. Alberta was more or less a "graveyard" for L.C.L. shipments. Loganberries sold at an average to shippers of $1.10; blackberries, 82 cents; Youngberries, $1.22; gooseberries, 99 cents; red currants, $1.08; and black currants, $1.54 per crate. All these prices are below the cost of production. It would be well if growers of late berries considered the new factors competing against them—early crops of deciduous fruits now coming in under favoured tariffs and a substantial production of Prairie-grown berries.

One large grower of berries in Kelowna realizing the heavy supplies that were rolling from the Coast to Prairie markets processed all his strawberries and raspberries. This took two cars of strawberries and twelve cars of raspberries off the fresh-fruit market.

PROCESSED BERRY-PACKS FOR 1938.

	SO_2.	Frozen.	2x1.	3x1.	4x1.	Pulp.
Lower Mainland.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.
Strawberries	2,496,888	3,000	540,704	208,340	26,000	.....
Everbearing	71,550	.....	1,000	.....	.....	.....
Raspberries	1,247,228	142,942	2,000	1,800	.....	.....
Loganberries	150,904	21,787	.....	500	.....	.....
Black currants	76,519	23,974	.....	.....	.....	.....
Blackberries	46,508	16,354	.....	500	.....	6,400
Gooseberries	21,603	3,000	.....	.....	.....	.....
Vancouver Island.						
Strawberries	197,162	5,159	4,500	4,332	.....	.....
Raspberries	5,220	.....	.....	1,269	.....	.....
Loganberries	8,545	9,355	.....	1,081	.....	.....
Black currants	.....	.....	.....	.....	.....	23,144
Red currants	.....	.....	.....	.....	.....	1,480

EXPORT SHIPMENTS OF LOWER MAINLAND.

	Great Britain.	Eastern Canada.	Hong Kong.	New Zealand.	Singapore.	Sweden.	Total.
	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.
SO_2 strawberries	1,102,800	18,200	.....	1,750	.....	1,750	1,124,500
3x1 strawberries	11,200	117,580	4,950	.....	600	.....	134,330
4x1 strawberries	.....	39,636	.....	.....	.....	.....	39,636
2x1 strawberries	.....	36,000	.....	.....	.....	.....	36,000
SO_2 raspberries	956,159	4,000	.....	.....	.....	.....	960,159
Frozen raspberries	.....	12,250	.....	175	.....	.....	12,425
3x1 raspberries	.....	20,000	.....	.....	.....	.....	20,000
Frozen black currants	18,000	90,100	.....	.....	.....	.....	108,100
SO_2 black currants	63,720	.....	.....	.....	.....	.....	63,720
SO_2 blackberries	24,960	.....	.....	.....	.....	.....	24,960

EXPORT SHIPMENTS FROM VANCOUVER ISLAND.

	Great Britain.	New Zealand.	Australia.	U.S.A.	Total.
	Lb.	Lb.	Lb.	Lb.	Lb.
SO_2 strawberries	296,819	22,504	.....	.....	319,323
Frozen strawberries	.....	9,366	2,103	.....	11,469
Frozen loganberries	.....	2,800	.....	22,500	25,300
Frozen raspberries	.....	1,400	.....	.....	1,400
Other berries	.....	.....	.....	.....	5,974

Unsold, both Mainland and Island, approximately 500 tons strawberries.

CHERRIES.

Weather conditions favoured the cherry deal this year and a record crop was harvested and sold on the fresh-fruit and processed markets. Prices were lower than in 1937. The movement to the fresh-fruit market was as follows:—

	Bings.	Lamberts.	Other Varieties.
	Cases.	Cases.	Cases.
Okanagan and main line	66,034	26,485	3,067
Nelson	5,007	8,056	3,593
Creston	2,696	5,017	2,020

Canners, 7,295 cases.

INTERIOR PROCESSED CHERRIES.

	Lb.		Lb.
Royal Anne	452,368	Hoskins	279
Lambert	202,521	White Heart	2,082
Bing	40,623	Waterhouse	2,547
Deacon	49,067	Governor Wood	283
Centennial	41,949	Biggereau	8,166
Yellow Spanish	23,542	Miscellaneous	1,658
Black Republican	50,085	Okanagan cherries processed at Coast	105,000
Windsor	208,715		
Black Tartarian	59,494		
Black Knight	7,974	Total	1,258,064
Rockfort	1,711		

APRICOTS.

The apricot-crop was nearly double that of 1937. The fresh-fruit market absorbed 217,332 boxes and 22,427 boxes were canned.

PEACHES.

Peaches exceeded in volume the crop of 1937 and prices ruled lower; 376,957 cases were sold on the fresh-fruit market, 15,704 canned, and 240 cases exported.

PLUMS.

This fruit is not in heavy demand, but the yield of 1938 exceeded that of 1937. The fresh-fruit market took 98,350 crates, 8,060 crates were exported and 154 canned.

ITALIAN PRUNES.

Okanagan and main line figures show an increase over the 1937 crop. Shipments were made as follows:—

	Crates.
Okanagan and main line	239,776
Nelson District	243
Creston District	3,185
Export	425

CRAB-APPLES.

The crab-apple crop sold in 1938 shows a slight decrease.

	Domestic.	Export.	Cannery.
Hyslops—	Boxes.	Boxes.	Boxes.
Okanagan and main line	53,028	11,044	1,038
Nelson	467	------	------
Grand Forks	423	------	------
Creston	2,167	------	------
Transcendents—			
Okanagan and main line	47,474	------	1,000
Nelson	175	------	------
Creston	2,077	------	------

PEAR SHIPMENTS.

	Domestic.	Export.	Cannery.
Okanagan and main line—	Boxes.	Boxes.	Boxes.
Bartletts	115,367	4,358	9,941
D'Anjou	20,855	27,254	------
Clapps Favourite	3,501	------	------
Dr. Julis	1,565	------	------
Flemish Beauty	60,561	51,778	------
Others	17,008	3,256	------
Nelson District (assorted varieties)	3,053	------	------
Creston District (assorted varieties)	15,062	1,390	------
Grand Forks District (assorted varieties)	2,356	------	------

APPLES.

Owing to a partial crop-failure in Great Britain the export has exceeded that of 1937, while the demand from the Domestic market fell off slightly. Some loss was caused in harvesting McIntosh and other early winter varieties, due to shortage of cold storage in small districts. The following table will show distribution at December 31st, as well as the comparative figures for 1936 and 1937.

DOMESTIC MARKETS.

Province.	1938.	1937.	1936.
British Columbia	126,237	194,474	130,791
Alberta	516,575	461,860	499,027
Saskatchewan	479,012	488,992	483,049
Manitoba	355,877	346,158	348,463
Ontario	96,802	90,373	145,511
Quebec	128,479	181,003	229,716
Maritimes	10,510	9,577	16,721

EXPORT SHIPMENTS.

Country.	1938.	1937.	1936.
Great Britain	2,232,153	2,079,252	1,621,444
Egypt	49,506	4,540	16,331
South Africa	63,854	46,508	46,195
South America	100,092	26,460	46,114
Scandinavia	7,642	500	------
France	4,536	5,292	9,242
New Zealand	6,620	5,120	3,620
U.S.A.	23,469	2,250	16,573
Other countries	18,917	14,730	17,549

Total shipped to date, export and domestic:—

		Balance unsold.
1938	4,220,281	1,251,111
1937	3,957,089	1,287,350
1936	3,630,346	521,586

POTATOES.

The carry-over of the 1937 crop was slightly short of the consumers' needs and all the graded potatoes were used up when the 1938 crop came on the market. Prices for the 1937–38 main crop averaged $18 per ton to Lower Mainland growers, while Vancouver Island crop averaged $20 per ton to growers. The production of potatoes in British Columbia for 1938 was rather patchy. Vancouver Island, especially the south end, was too dry. The

Lower Mainland had sufficient moisture, and the Interior, where irrigation is practised, had a fair crop. Rain came near the end of the season and caused damage to the crop at Ashcroft. Export for the main crop will be confined to the Orient as all Prairie markets and United States points have surpluses to dispose of. Prices up to December 31st have been well maintained, as the following figures will show:—

SALES BY COAST VEGETABLE BOARD AGENCY.

	Tons.	Average per Ton.
Pemberton Meadows	567	$27.98
Coast grown—		
Early crop	2,346	26.97
Second crop	1,545	21.76
To December 31st, main crop	2,929	23.89

EXPORT POTATOES, 1938 CROP.

	Prairies.	Hong Kong.	Singapore.	Suva.	Yukon.
	Sacks.	Sacks.	Sacks.	Sacks.	Sacks.
September	26,038	7,260	2,535	80	960
October	------	6,116	285	112	----
November	------	2,733	310	----	----
December	------	1,000	285	360	----

CONCLUSION.

The acreage of field rhubarb as well as the amount of forced rhubarb under heat produces far in excess of what the markets will absorb. More than half of the field rhubarb is left to rot in the fields. The low returns of the past few years can be traced directly to overproduction. The same condition exists in strawberry acreage. The increase in this commodity is largely brought about by Japanese, who do not take any warning but continue to plant, irrespective of prices realized on the market. If, as in the case of forced rhubarb, it affected them alone the case would be a matter for them to adjust, but in the production of field rhubarb and berries many white producers are placed in danger of losing their investment and living.

Some form of quota might correct this state of affairs. Greater distribution has its base in a lower retail price to the consumer. We have observed that a slight lowering of retail prices greatly increases consumption, especially in a perishable fruit like strawberries. These retail at peak production at 12½ cents per hallock in Saskatchewan and Manitoba, while in Alberta they sell at 10 cents. This lower price in Alberta has increased consumption *per capita* to approximately double that of each of the other two Provinces. We understand that this problem is under negotiation between express companies and growers' representatives. There is sufficient production now, if these negotiations are successful, to meet any increase in consumption without further increase in acreage.

REPORT OF HORTICULTURAL BRANCH.

W. H. ROBERTSON, B.S.A., PROVINCIAL HORTICULTURIST.

In all districts throughout the Province the winter was mild with no extremes of temperature. The spring weather was most seasonable. Early crop movements were about the same as in 1937. The summer in all sections was hot and dry. While the fall had sufficient rainfall to increase the size of apples and other crops it did not interfere with harvesting in general. The result was that all crops were gathered under excellent conditions, both for harvesting and storing. Occasional rains and snow in some districts have improved the soil-moisture requirements to a certain extent. In many areas, however, more soil-moisture is required.

Horticultural Crops.

Tree Fruits.—Due to mild winter conditions tree-fruits came through in excellent condition. There was a heavy spring blossom and a good set of fruit, with conditions both for growth and harvesting satisfactory. Apples sized much better than anticipated. Present indications are that the crop when finally marketed will be in many cases heavier than last year, and possibly larger than shown in the estimates made during the season. The following table indicates the crop of tree-fruits in the Province for 1937 and the estimated production for 1938.

Fruit.	1937 Production.	Estimated 1938 Production.
Apples (boxes)	5,798,312	5,391,635
Crab-apples (boxes)	155,608	137,962
Pears (boxes)	302,586	343,175
Plums and prunes (crates)	392,672	414,750
Peaches (crates)	417,313	461,800
Apricots (crates)	158,015	176,850
Cherries (crates)	153,250	177,860

Small Fruits.—The crop of all small fruits, such as strawberries, raspberries, loganberries, was heavy and the shipments of fresh fruit much heavier than last year. This applies to the small-fruit areas of Vancouver Island and the Fraser Valley. In the Kootenay sections considerable loss of small fruits was experienced due to the fact that local jam plants had a carry-over from 1937 and could not take all that the growers were offering. Some idea of the 1938 possible production may be secured from the following figures, which show the 1937 production and the estimated production for 1938:—

Fruit.	1937 Production.	Estimated 1938 Production.
Strawberries (crates)	502,854	615,050
Raspberries (crates)	217,481	181,650
Blackberries (crates)	42,350	50,240
Loganberries (lb.)	1,539,385	1,787,070
Gooseberries (lb.)	325,355	403,850
Red and black currants (lb.)	381,489	609,430
Grapes (lb.)	2,384,759	2,500,000

Vegetables.—While it is impossible at the present time to give definite figures showing the production of vegetables in the Province during the past year, a good idea may be obtained from the acreage figures as shown below:—

Kind.	1937 Estimated Acreage.	1938 Estimated Acreage.
Tomatoes	3,210	3,331
Onions	994	1,406
Lettuce	455	541
Celery	318	328
Cucumbers	175	192
Cabbage	452	504
Cantaloupes	178	232

All tomato-producing areas report a heavy loss this year. Spring conditions were unfavourable for the growth of plants and the market for shipping-fruit was low. Many tons were lost before the canneries started and their period of operation was shorter than usual.

The acreage in onions was larger than in 1937, but dry weather and thrips materially reduced the yield. The actual tonnage will be little more than that harvested last year.

Peas for canning purposes show a decrease in acreage, with fair yields but somewhat lowered price due to heavy grading. The dried-pea acreage in the Interior shows an increase. A very good indication of its growth may be obtained from the following statement submitted in the report of Mr. C. R. Barlow, District Field Inspector, Salmon Arm: "Field-pea acreage, grown under contract in the Salmon Arm and Westwold sections this year showed a very substantial increase. In 1936 an initial planting of 190 acres was made. In 1937 this was

increased to 270 acres, and a further increase to 489 acres was made this year. This year's acreage was divided among fifty growers and the principal varieties grown were 'Sterling,' 'Idabelle,' 'Bluebell,' 'Manchurian,' 'Thos. Laxton,' 'Dashaway,' and 'Early Wisconsin Sweet.' Yields on some of the lighter bench soils were adversely affected by the dry conditions, but satisfactory yields were secured in the Salmon River Valley and most growers were able to show good returns on their operations."

Frozen Vegetables.—A feature of the vegetable business which was started this year was the freezing of vegetables for the market. This work has been undertaken in the East and in the United States with outstanding success. This year it was tried in New Westminster and a considerable tonnage of peas, beans, and corn frozen for the market. On Vancouver Island approximately 10 tons of peas and smaller quantities of other vegetables, including beans and asparagus, were frozen and placed on the market. The popularity of this product with the consumer seems to warrant increased tonnage being handled this way in 1939.

Asparagus production shows a general increase in the Province and during the past season very satisfactory returns were received, both from the cannery and the fresh market. Some idea of the increase in acreage devoted to the crop may be obtained from the following table:—

Asparagus Acreage, 1930–38.

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

Rhubarb.—It is interesting to note the increase in acreage made by this crop. In 1920, 91 acres were grown; this had increased to 572 acres in 1938. The major portion of this crop is grown in the Lower Mainland, both in the field and for forcing. Mr. G. E. W. Clarke, District Horticulturist for that area, makes the following comments regarding this year's production: "The handling of this crop co-operatively through the facilities of the Berry Shippers' Federation proved more satisfactory than would otherwise have happened. The first car of field rhubarb was shipped on April 12th, a day earlier than in 1937, but weather conditions on the Prairies were not favourable, consequently the shipments were slightly less with lower prices. Returns to growers this year are considerably in advance of returns received by growers in 1937. Approximately sixty-two straight cars of field rhubarb were shipped this season, not including local requirements.

"Forced rhubarb being the earliest crop handled by a number of small-fruit growers is of considerable importance. The tendency is to produce more than the present market can absorb, and this larger production, coupled with low prices, has made it necessary to stress the importance of grading and packing a good quality product.

"Forced rhubarb was on the market this season before Christmas and the demand at this time of the year is small. Probably due to the situation in the Orient the movement on the Vancouver market was slow, although during the latter part of February and March shipments to points outside the Province increased and a production about equal to that of 1937 was handled, at somewhat lower prices, up to the time of movement of field rhubarb in April. Approximately twenty-one cars of forced rhubarb were handled."

Tobacco.—The acreage in tobacco in the Sumas Reclamation Area was a little over 375 acres, which is nearly the same as in 1936. Yields and quality have been satisfactory, although final returns are not available. Ideal weather prevailed during the harvesting and curing of the crop.

Hops.—Hop production is centred in the vicinity of Chilliwack and comprises approximately 1,100 acres producing. The past season was favourable for the production of a good

crop and will show an increase over 1937. In the Kamloops District there is approximately 22 acres, only part of which is producing.

Nut Culture.—Nut-growing in different sections, particularly in the Fraser Valley, is showing an increase. No commercial plantings of walnuts, chestnuts, and almonds have been made; plantings of these trees are mostly confined to areas along driveways or property boundaries. Here they serve the purpose of shade and ornamental trees and may provide a small income. Filberts have been planted fairly extensively. At the present time there are 79 acres of filberts in all sections of British Columbia.

Grapes.—The principal grape plantings at the present time are to be found in the Okanagan. Next in importance is the Fraser Valley District, followed by Vancouver Island. The following figures compiled during the past seasons show the approximate plantings in the different sections:—

District.	Grapes.		
	1–5 Years.	6–10 Years.	Over 10 Years.
Vancouver Island	6½	6½	2
Fraser Valley	33½	53¾	----
Salmon Arm, Kamloops	1⅛	1	2¼
North Okanagan	37½	31	170
Totals	78⅝	92¼	174¼
	345⅛ acres.		

SMALL-FRUIT SURVEY.

A survey of the acreage devoted to small fruits in British Columbia made this year indicates that there are 6,463 acres devoted to small fruits and rhubarb in the Province. These surveys have been made biennially since 1920. A table showing detailed acreage of each survey is herewith submitted as Appendix No. 3.

PRUNING DEMONSTRATIONS.

One-day pruning demonstrations were held in different sections during the year. A total of 100 one-day demonstrations were given with a total attendance of 1,049 people.

SPRAYING AND THINNING DEMONSTRATIONS.

The necessity for more and better spraying equipment is becoming apparent. No matter how good the spraying outfit may be, if the individual using it does not understand the best methods of applying sprays some of the value is lost. With this in mind seven demonstrations in spraying were organized and 308 were in attendance in the Southern Okanagan District. The results were very satisfactory if attendance is a criterion.

Due to the heavy peach-crop of 1937 coupled with a minimum amount of thinning the packed fruit was small. Many complaints were received from the purchasing public regarding the small fruit. This year it was decided to hold a few demonstrations in the principal peach areas to show the growers the best methods of thinning, with the object of getting increased size of fruit. Demonstrations were held at nine places and the attendance was 210.

SEED PRODUCTION.

The production of flower-seed in the Province shows little change from year to year. The major portion is grown on contract and the production is in the hands of a few experienced growers and confined principally to the southern portion of Vancouver Island.

There has been little change in the vegetable-seed acreage during the past year or two. Any increase is due to a more extensive planting of peas for seed purposes. A reduction in price on the world markets has been felt by British Columbia producers, and at the present time some growers are holding quantities of onion-seed unsold. Furthermore, contracts for this seed are not as readily available as in the past. This applies particularly to domestic orders. Foreign contracts are about the same as in previous years.

A pleasing feature of the present situation is the demand for elite and registered seed for production work. This year one firm is making a special feature of selling only registered or certified seed and is placing contracts accordingly. A number of the older seed-houses have also intimated that they wish to secure seed of this class.

This year there was formed the British Columbia Seed Growers' Association. The objects of this association are briefly to protect the interests of all seed producers in the Province and to assist in maintaining a high quality for all seed produced.

PLANT DISEASE AND PEST-CONTROL WORK.

Fire-blight.—In all districts the usual dormant season inspection for fire-blight was made, and as summer conditions were unfavourable for its development the result was that all areas showed less of this disease than for several years. The results of the inspection-work as carried out in the Okanagan are given in the following table:—

FIRE-BLIGHT INSPECTION REPORT, 1938.

District.	Total Acres inspected.	Inspected and passed.	Not passed.
Salmon Arm	252	240	12
Vernon	6,247	6,056	191
Kelowna	5,000	4,850	150
Summerland	3,058	3,043	15
Penticton	1,250	1,240	10
Totals	15,807	15,429	378

Potato-beetle.—There have been no new outbreaks of potato-beetle during the past year. In the East Kootenay District the work was again under the supervision of Mr. A. McMeans. His report indicates that in the majority of areas where dusting is carried out there are fewer beetles to be found than in 1937 and no extension of the infested area.

At Salmo and Thrums where beetle was discovered last year there has been no spread of the beetle. A thorough dusting was given the infested areas this year.

In the Grand Forks District it is expected that this infestation may be cleaned up in 1939.

Pea-moth.—Pea-moth is found in many sections of the Fraser Valley. As this insect materially affects the production of canning-peas, which are grown extensively in this area, it was thought advisable to take certain steps to protect districts where peas for canning purposes can be grown and in which pea-moth was not widely distributed. Acting upon the request of the growers the Government created a Pea-moth Control Area in the Matsqui District. Under the regulations growers were permitted to produce peas for canning purposes. The production of peas for podding as well as for sale as dried peas or seed was prohibited. The results this year were very satisfactory.

San Jose Scale.—San Jose scale-control work was again carried out at Kaslo, Spence's Bridge, and in the Keremeos-Cawston area. New outbreaks have also been reported from Osoyoos and Kelowna. A shipment of export apples to Egypt and which are reported to have come from Penticton were found to have San Jose scale infestation. A careful survey is being made to ascertain the orchard or orchards in this district in which scale is present. All owners of orchards in which San Jose scale has been found during the past season will be instructed to do the required spraying and pruning.

Codling-moth.—The same number of spray zones for codling-moth control were in operation as last year. In the Vernon city area at the request of the city council, codling-moth sprays were applied as required.

As codling-moth is now prevalent in all of the main orchard areas, the value of the spray zones is not as great as it was a few years ago. With the increase of this pest it is a case of spray or retire from fruit-growing.

Nursery Inspection.—As in the past inspection-work in all nurseries was again carried out. The following table gives the principal details of inspections undertaken:—

	Number inspected.	Number passed.	Number condemned.
Apples and crabs	65,865	65,046	819
Pears	20,904	20,724	180
Plums and prunes	26,355	26,152	203
Cherries	13,748	13,451	297
Peaches and apricots	24,080	23,615	465
Miscellaneous	4,021	4,019	2
Totals	154,973	153,007	1,966

Twenty-five nurseries inspected; thirty-three inspections made; 1.3 per cent. of the inspected stock was condemned.

During the past year 105 nursery licences were issued in the proportion of seventy-four licences to nurserymen and thirty-one to agents.

HORTICULTURAL DEMONSTRATION-WORK.

The amount and kind of horticultural demonstration-work undertaken in different sections of the Province is most varied. The work depends upon the outstanding problems in the various areas that require investigation, as well as the time and assistance available. The following summary shows briefly what lines of investigation are being given consideration in each major horticultural section of the Province:—

Vancouver Island—Strawberry Plant Selection; Strawberry Variety Trials; Boysenberry Trials; Grape Variety Trials; Rhubarb Trials; Lettuce Variety Trials; Chinese Pear Trials.

Lower Mainland—Dusting for Red Spider; Raspberry-plot work; Yellow-rust Control; Brown-rot Control; Corn Variety Trials; Lettuce Variety Trials; Sweet Corn Trials.

Okanagan—Raspberry Variety Trials; Hardy Apple Stock Trials; Sweet Corn Trials; Bacterial-canker Control; Fertilizer and Chemical Trials with Onions; Celery-fertilizer Trials; Celery Variety Tests; Apple-scab Control; Lettuce Variety Trials; Lettuce-fertilizer Trials; Orchard-fertilizer Work; Codling-moth Spray Trials; Treatment of Orchard Boxes for Codling-moth, European Red-mite Control; Tomato-worm Control; Hand-pollination of Fruit-blossom.

Kootenay—Cherry Fruit-fly Control; Mealy-bug Control; Apple-scab Sprays; Orchard-fertilizer Work.

Strawberry Plant Selection.—This work was carried out by Mr. E. W. White, District Horticulturist for Vancouver Island. The two chief commercial varieties—Magoon and British Sovereign—were used. The following from Mr. White's report indicates the work done:—

"A new planting of about ½ acre of selected Magoon plants at Gordon Head, planted in 1937, produced its first crop this season. The plants made a uniform growth in 1937 and again this year. A good uniform crop was produced this season. The yield was greater than on a corresponding area of British Sovereign. This patch is being ploughed out this winter after one crop, owing to the generally unsatisfactory condition of the strawberry market.

"At Keating, the plantings of 1934 and 1935 were cropped again this year, but have since been ploughed out. The fruit was not outstanding.

" Strawberry plant selection-work with British Sovereign, which is being carried on at the Dominion Experimental Station, Saanichton, made progress this year. The selected

plants from seven growers were carried through the winter of 1937–38 in a cold-frame. This spring the plants which survived the winter were planted out in a permanent location. A considerable number of plants did not come through the winter in the cold-frame. However, the plants which were set out this spring have made excellent growth during the season and have produced a fine stand of maiden plants for setting out next spring. The progeny of each original plant is being kept separate. There will be sufficient plants to make a test next year. So far there has been no outstanding difference in the vegetative growth of the plants."

Raspberry Demonstration-work.—The raspberry plot supervised by Mr. G. E. W. Clarke at Abbotsford has been operated with a view to establishing recommendations on disease control as well as proving the value of cover-crops. Report on this work is herewith submitted:—

"In view of the fact that it has become difficult to establish and maintain a Cuthbert raspberry planting in a thrifty and productive condition, the planting started in 1934 has been under observation. Carefully selected plants from a few apparently healthy Cuthbert plants growing locally were set out in the spring of 1934 on 2 acres, in 1935 another 2 acres were planted and in 1936, 1 acre.

"The planting has made good growth and development, but has suffered from winter injury. In order to eliminate the disease factor, arrangements were made to lay out a series of trial plots on the 1934 planting.

"This planting made excellent growth in 1934 and the marketed crop was approximately 1,500 lb. per acre. The winter of 1935–36 was severe and the canes were damaged. The harvested crop for 1936 was approximately 500 lb. The cane growth of 1936 was severely injured during the winter of 1936–37 and as a result the 1937 crop was not worth picking. The 1937 cane growth was strong, and following a comparatively mild winter the 1938 yield was approximately 4,800 lb. per acre. The marketed crop of Cuthbert raspberries from the 5 acres was slightly over 12 tons.

"In checking the 1934 planted block during the season the cane growth has been very good and it is difficult to note any marked improvement of the treated sections over the untreated and checked sections. To date this planting is in good condition.

"*Cover-crops.*—A comparison between spring vetch and Austrian winter peas for a cover-crop was made on the 1935 Cuthbert raspberry planting of Mr. K. Baker, Abbotsford, B.C.

"Ten panels 150 feet in length were seeded—five panels to spring vetch at the rate of 50 lb. per acre and five panels to Austrian winter peas at 60 lb. per acre.

"Seeding was done with a hand-seeder on May 5th and 6th, 1938. Prior to seeding the panels were thoroughly cultivated.

"Germination was good and growth was rapid during the first part of the season, but dry weather during the summer checked development.

"The spring vetch made a slightly stronger growth and in places where matted less weed development was noted than in the panels seeded to Austrian winter peas.

"The Austrian winter peas made good growth, but were not as vigorous and did not cover the ground to the same extent as the vetch.

"During the picking season neither the vetch nor the peas hampered picking and pickers preferred picking in these seeded panels rather than in the clean cultivated panels, it being somewhat cooler and not as dusty.

"In the clean cultivated panels two cultivations were necessary during the picking season, while no cultivation was done in the seeded panels after the seeding, except for a hoeing around the plants prior to picking.

"The raspberries in the cover-crop panels maintained their size and quality throughout the long picking period of this past season.

"The tramping of the pickers up and down the rows damaged the Austrian winter peas, while the spring vetch seemed to stand up under this tramping and having reseeded is showing good growth and a dense matting is showing this fall. There has been no reseeding or continued growth of the Austrian winter peas.

"The dry summer did not favour the maximum development of either of these cover-crops, but from observations spring vetch is more satisfactory as a cover-crop for this

work than Austrian winter peas. A heavier rate of seeding would be advisable for cover-crop work in raspberries."

Raspberry Variety Trials—Work with raspberry varieties was carried out in both the Salmon Arm and Vernon districts. The Salmon Arm work is reported on by Mr. C. R. Barlow, District Field Inspector, as follows:—

"This work was started in the spring of 1936 when nine varieties of raspberries (25 canes of each) were planted at Salmon Arm, with the object in view of testing their comparative hardiness, quality, and cropping characteristics. All the varieties produced a sufficient crop this year to enable some conclusions to be reached as to their respective merits with regard to bearing, vigour, shipping qualities, and quality of the fruit, and the following table gives this information in brief form:—

Variety.	Growth.	Crop.	Size of Berry.	Firmness.	Flavour.
Preussen	Strong, erect.	Good.	Large.	Firm.	Good.
June	Strong.	Fair.	Small.	Soft, crumbly.	Poor.
Adams 87	Medium to weak.	Fair.	Medium.	Fairly firm.	Very poor.
Antwerp	Weak.	Poor.	Small.	Soft.	Poor.
Chief	Strong, erect.	Fair to good.	Medium.	Firm.	Good, slightly acid.
Newman 20	Medium.	Fair.	Medium.	Fairly firm.	Poor.
Newburgh	Strong, erect.	Very heavy.	Large.	Firm.	Fairly good.
Ohta	Medium, erect.	Fair.	Small.	Medium, soft.	Poor.
Ontario	Medium, erect.	Fair.	Small.	Medium, soft.	Very poor.

"From the standpoint of hardiness, which is a most important consideration in this district, no information is yet available as the winter of 1937–38 was so mild that all varieties came through without injury, and it will be necessary to extend the duration of the tests in order to secure information on this point. Observation of the canes and fruit was made at intervals during the season, and as a result it was decided that six of the nine varieties could safely be discarded as they showed various undesirable characteristics. These varieties were June, Adams 87, Antwerp, Newman 20, Ohta, and Ontario; reference to the above table will show the reasons for adopting such a course. The three remaining varieties, Newburgh, Chief, and Preussen are worthy of further trial. Of these probably Newburgh is the most promising. The canes are erect and strong, the fruit firm and large with fairly good flavour, and it appears to be an outstanding heavy cropper. The fruit matures a few days earlier than Newman 23, which is the variety most extensively grown at Salmon Arm at the present time, and the picking season extends slightly longer than that variety. Chief and Preussen, though producing good crops of firm, high-quality berries, did not appear to be nearly as prolific bearers as Newburgh, but both varieties are of superior quality to Newman 23. Crates made up of one-quarter each of Newman 23, Chief, Newburgh, and Preussen were shipped to Moose Jaw, Sask., and all four varieties were reported upon as being in perfect condition on arrival, and well able to stand another day's shipment.

"If Newburgh proves satisfactory from the standpoint of hardiness it is not unlikely that it may replace Newman 23 as a commercial berry for this district, as it appears to be an equally good shipper, a heavier cropper, and of better quality. It is hoped that in addition to further tests with Newburgh, Chief, and Preussen next year a few more of the newer varieties can be secured for test at the same time."

In the Vernon district this work was under the supervision of Mr. H. H. Evans, District Field Inspector. The following is taken from his report:—

"This is a continuation of the work begun in 1932 to study climatic adaptability with yield and quality comparisons. In the fall of 1937 all varieties were discarded with the exception of Latham, Lloyd George, and Newburgh.

"The winter of 1937–38 was reasonably mild throughout and winter injury not anticipated. There was, however, a slight bud kill in the Lloyd George with none in Latham

or Newburgh. In commercial plantings throughout the district there appeared medium to severe bud injury in the Viking and Lloyd George plantings.

"Growth conditions over the past season were quite good, but extreme drought and heat during the fruiting period affected the yield. Many of the berries ran small and others oversoft for market. Latham proved very disappointing in yield and the berry became very crumbly.

"Lloyd George yield was below normal, but the berry was excellent in size and quality, but inclined to softness. Newburgh not in full bearing, with yield promising, berry firm, good colour, and fair quality.

"The Taylor variety obtained from the Dominion Experimental Farms, Ottawa, was added to the plots last spring. Unfortunately only one plant survived the growing season.

"It is hoped to renew this plot in 1939 and add other promising varieties which may be available."

Lettuce Variety Trials.—The principal lettuce plantings in the Province are in the Fraser Valley and the Okanagan. For a number of years variety trials have been made in both of these districts and were continued in 1938. The results in the Fraser Valley are reported on by Mr. Clarke as follows:—

"The test plots were grown by Mr. D. G. McLellan, Burnaby. The peat-muck soil is representative of a large area in which a large quantity of the commercial crop is produced.

"Seeding was made in the open on April 6th and germination and growth of all plots was good. The plants were thinned to a distance of 15 inches.

"Twenty plants from representative plots of each variety were used for comparison, and the following is a summary of examinations made on June 27th and July 11th:—

"*Seed-house No. 1.*

"*Imperial No. 152 (No. 5136).*—June 27th: Beginning to form heads, inclined to be larger and not uniform. July 11th: Four heads fairly firm, twelve heading well; four very loose, no value. Good type, quality and flavour good. No tip-burn.

"*Imperial No. 847 (No. 6134).*—June 27th: Heads beginning to form. July 11th: Four heads firm, thirteen fairly firm; three soft, no value. Heads small but good type; quality and flavour good. Slight tip-burn showing.

"*Imperial No. 515 (No. 5205).*—June 27th: Good development and beginning to form heads. July 11th: Heads large, good type, five fairly firm, twelve firming up; three loose, no value. Inclined to be large but of good type; quality and flavour good. No tip-burn.

"*Seed-house No. 2.*

"*Imperial No. 847.*—June 27th: Forming heads uniformly. July 11th: Seven heads firm, eleven fairly firm, two no value. Good type and size; quality and flavour very good. No tip-burn showing.

"*Imperial No. 615.*—June 27th: Heads beginning to form but not uniformly. July 11th: Nine heads fairly firm; eleven large and loose, practically no value. Heads are large and inclined to be loose; quality and flavour fairly good but commercial rating questionable. Slight tip-burn.

"*Tip-burn Resistant.*—There was a good germination but the plants did not do well. A few plants that developed were a good type of head; fairly firm, crisp, and very good in flavour and worthy of further testing.

"Fall plots were seeded on July 21st and again on August 12th, but weather was very warm and dry and germination was poor. The plants growing did not overcome the poor start and no report could be made."

The Okanagan trials were carried out at Armstrong and were under the supervision of Mr. H. H. Evans. The following is taken from his report on the work:—

"This project is a continuation of several years' work on variety testing, and is providing information of value to the commercial growers as to improved kinds for spring and fall production.

"The past season was excellent for this work, in that severe tip-burn conditions prevailed during the spring crop period. Similar conditions occurred during the fall crop period for the first time since the project was started. The first frost period for the fall crop was also severe and made a real test for frost-resistance.

"It was unfortunate this season that five of the strains under test failed in germination for both crops.

"*Spring Series.*—Eighteen plots; field planted from cold-frames April 22nd; plants per plot, twenty-five; examinations made June 3rd and June 20th.

"*Varieties and Strains under Test.*—Imperial No. 515, No. 847, No. 152, No. 615, No. 850; New York No. 12, one strain; Tip-burn Resistant; Columbia No. 1; T.B.R. Hybrid.

"*Seed-house No. 1.*

"*Imperial No. 515.*—June 3rd: Heads filling and firming fast, none fit to cut. June 20th: Cutting-heads, 95 per cent.; uniform type, solid, running large; size, four to five dozen; tip-burn light. Very good.

"*Imperial No. 847.*—June 3rd: Heads filling and firming fast, none fit to cut. June 20th: Cutting-heads, 95 per cent.; uniform compact type, solid; size, five dozen; tip-burn heavy. Good.

"*Imperial No. 152.*—June 3rd: Heads growing fast and filling, but not firming; none fit to cut. June 20th: Cutting-heads, 95 per cent.; uniform compact type, solid; size, five dozen; tip-burn heavy. Good.

"*Seed-house No. 2.*

"*Tip-burn Resistant.*—June 3rd: Heads growing and filling fast, but not firming. June 20th: Cutting-heads, 25 per cent.; most of heads blown; size, five dozen; tip-burn almost *nil*. Not suitable.

"*Imperial No. 847.*—June 3rd: Heads filling and firming fast, none fit to cut. June 20th: Cutting-heads, 95 per cent.; uniform compact type, solid; size, five dozen; tip-burn medium. Good.

"*Imperial No. 615.*—June 3rd: Heads filling and firming fast, none fit to cut. June 20th: Cutting-heads, 95 per cent.; uniform type, heads large; size, four to five dozen; tip-burn medium. Good.

"*Seed-house No. 3.*

"*New York No. 12, Stock No. 3593.*—June 3rd: Heads filling and firming fast, none fit to cut. June 20th: Cutting-heads, 92 per cent.; uniform compact type; size, five to four dozen; tip-burn medium, heads overmature. This strain quick maturing. Very good.

"*Imperial No. 515.*—June 3rd: Heads filling and firming fast, not so uniform, none fit to cut. June 20th: Cutting-heads, 90 per cent.; type not so uniform, solid; size, five dozen; tip-burn medium. Good.

"*Columbia No. 1.*—June 3rd: Heads growing fast, but slow filling, uneven. June 20th: Cutting heads, 80 per cent.; type and size very uneven, solid; size, five to four dozen; tip-burn very heavy. Not suitable.

"*Imperial No. 847.*—June 3rd: Heads filling and firming fast, none fit to cut. June 20th: Cutting-heads, 100 per cent.; uniform compact type, solid; size, five dozen; tip-burn heavy. Very good.

"*Imperial No. 615.*—June 3rd: Heads filling fast but not firming, none fit to cut. June 20th: Cutting-heads, none; large and very slack; tip-burn heavy. (Compare with same strain from Seed-house No. 2.)

"*Imperial No. 850.*—June 3rd: Heads filling and firming fast, good type but very uneven. June 20th: Cutting-heads, 95 per cent.; type compact but uneven; size, four to six dozen; tip-burn heavy. Fair.

"*T.B.R. Hybrid.*—June 3rd: Heads filling and firming fast, uniform compact type, none fit to cut. June 20th: Cutting-heads, 100 per cent.; large, uniform compact type; size, four to five dozen; tip-burn light. Very good.

"Where two sizes are given for a variety the first figure indicates the plot runs heavy to that size.

"*Fall Series.*—Duplication of spring plots. Field seeded, July 27th; plants per plot, fifty; examinations made, September 16th and October 17th.

"Trial plots were seeded one week later than the commercial crop with the object of late development to catch frost periods in obtaining resistance records.

"The continuous heat and drought of the late summer and fall periods speeded development so rapidly that maturity of the crop was more than two weeks in advance of any

season since the work was commenced. The first frost period did not occur until October 13th to 21st, nearly three weeks later than normally.

"These combined factors placed the plots in an unfavourable position as regards frost-resistance, as nearly all strains were overmature. Lettuce in this condition is subject to much more severe injury than is the case if the low temperatures arrive prior to full development of the head. At this stage frosts, if not too severe, have a hardening effect without injury. When fully or over mature the frost is inclined to penetrate rapidly with more or less severe injury, depending on the strain. Over the nine-day frost period, two nights of 12 degrees and two nights of 14 degrees of frost were recorded.

"*Seed-house No. 1.*

"*Imperial No. 515.*—September 16th: Heads filling and firming fast; compact type, good texture; eight heads fit to cut. October 17th: Cutting-heads, 98 per cent.; uniform type, solid; size, four to five dozen; no tip-burn; frost-injury medium; overmature. Very good.

"*Imperial No. 847.*—September 16th: Heads filling and firming fast; seven heads fit to cut. October 17th: Cutting-heads, 98 per cent.; uniform compact type, coarse texture, solid; size, five dozen; tip-burn none; frost-injury medium light; overmature. Very good.

"*Imperial No. 152.*—September 16th: Heads filling and firming fast, none fit to cut. October 17th: Cutting-heads, 90 per cent.; uniform compact type, solid, good texture; size, five dozen; tip-burn medium, frost-injury severe; much overmature. Good.

"*Seed-house No. 2.*

"*Tip-burn Resistant.*—September 16th: Heads filling but very slack, none fit to cut. October 17th: Cutting-heads, 50 per cent.; fair type, good texture, heads fail to harden; tip-burn medium, frost-injury heavy. Not suitable.

"*Imperial No. 847.*—September 16th: Heads filling and firming fast, five heads fit to cut. October 17th: Cutting-heads, 100 per cent.; uniform compact type, solid, coarse texture; size, five to four dozen; tip-burn none, frost-injury light, overmature. Very good.

"*Imperial No. 615.*—September 16th: Heads developing slowly, filling good, none fit to cut. October 17th: Cutting-heads, 95 per cent.; uniform large fairly compact type, coarse texture; size, four to five dozen; tip-burn medium, frost-injury medium, overmature. Fairly good.

"*Seed-house No. 3.*

"*New York No. 12, Stock 3593.*—September 16th: Heads filling fast, slow firming, none fit to cut. October 17th: Cutting-heads, 98 per cent.; uniform compact type, firm, fine texture; size, five dozen; tip-burn none, frost-injury medium, much overmature. Good.

"*Imperial No. 515.*—September 16th: Heads filling and firming fast, none fit to cut. October 17th: Cutting-heads, 98 per cent.; uniform compact type, solid, good texture; tip-burn none; frost-injury medium; size, five dozen; much overmature. Very good.

"*Columbia No. 1.*—September 16th: Heads filling fast, not firming, none fit to cut. October 17th: Cutting-heads, 10 per cent.; much too slack, poor type; size, four to five dozen; tip-burn light, frost-injury very heavy, much overmature. Not suitable.

"*Imperial No. 847.*—September 16th: Heads filling fast but uneven; three heads fit to cut. October 17th: Cutting-heads, 100 per cent.; uniform compact type, solid, texture coarse; size, five to four dozen; tip-burn none, frost-injury medium light, overmature. Very good.

"*Imperial No. 615.*—September 16th: Heads filling fast, not firming, none fit to cut. October 17th: Cutting-heads, 95 per cent.; uniform, large, fairly compact, texture coarse; size, four to five dozen; tip-burn none, frost-injury medium, overmature. Good.

"*Imperial No. 850.*—September 16th: Heads filling and firming, very even, five heads fit to cut. October 17th: Cutting-heads, 100 per cent.; excellent uniform compact type, fine texture; size, five dozen; tip-burn none, frost-injury medium, much overmature. Very good.

"*T.B.R. Hybrid.*—September 16th: Heads filling and firming fast, none fit to cut. October 17th: Cutting-heads, 100 per cent.; uniform compact type, solid, fair texture; size, five to four dozen; tip-burn none, frost-injury medium heavy, overmature. Good.

"As previously mentioned, tip-burn injury for the first time struck our fall plantings. The above records are interesting in tip-burn damage as between plots on the fall crop, but more so in making comparisons of performance between the same strains in the spring and fall crops.

"Strains worthy of continuing tests are Imperial No. 847, No. 850, No. 515, No. 615, and all of the New York No. 12 strains."

Apple-scab Control.—Due to the dry weather conditions during the past season there was less apple scab than for a number of years. In the Vernon area Mr. H. H. Evans is in charge of this work. His annual report regarding this work reads as follows:—

"The Vernon District was practically free of apple-scab over the past season. On the experimental plots there was no scab developed even on the check or unsprayed trees. Under these conditions the pathologists of the Dominion Experimental Station considered it useless to make fruit counts at harvest-time. This leaves little to present in table form and this is omitted for the current season.

"The following summary covers other features and observations of the work:—

"Materials used were lime-sulphur, Kolofog, micronized sulphur, wettable sulphur, colloidal sulphur, calcium arsenate, lethalate fluid, and Fluxit.

"There were fourteen plots in the series. The several fungicides were used in varying strengths and combinations as in past years.

"After the pre-pink application a very slight edge-burn and some body spotting of the leaves was noticeable on all plots which received lime-sulphur alone or in combination for this spray. None appeared on plots where the neutral sulphurs were used alone. Following the pre-pink spray, four night frosts were recorded of from 4 to 8 degrees of frost. This may have had some influence on the leaf-injury. No damage occurred on any plot from the calyx or cover sprays.

"Slight stunting and lighter colour of foliage was noticeable in the straight lime-sulphur plot. In all neutral sulphur plots the foliage appearance was good.

"An excellent crop was carried on all plots and there was little observed difference in size of fruit between plots where there was no soil variability."

With regard to this work in the Kootenay the following is taken from the report of Mr. E. C. Hunt:—

"Apple-scab has not been as prevalent here as in previous years; the disease has caused little, if any, losses to the growers in the sprayed orchards. Unsprayed orchards have shown considerable scab-infections on the fruit, but not to the same extent as usually found. Weather conditions were not very favourable for the development and spread of apple-scab.

"Some spraying demonstrations were again carried out this year in the Willow Point area in the control of this disease. Only one combination spray mixture was tested out—the lime-sulphur and calcium-arsenate mixture. The variety sprayed was McIntosh Red, old trees and in full bearing. Four sprays were applied: Pink, May 11th; calyx, May 26th; first cover, June 14th; and second cover, June 28th. Strength of mixture used was lime-sulphur 1 to 60 and calcium arsenate at the rate of 4 lb. to 100 gallons of water. All the apples on one tree were counted and gone over for scab-infection, with the following results: Total apples on tree, 1,944; clean, 1,941; scabby, 3; percentage of clean fruit, 99.8; scabby fruit, 0.02 per cent. The check or unsprayed tree was also counted, having a total of 1,183 apples; clean fruit, 187, and scabby fruit, 996—a percentage of 15.8 per cent. clean and 84.2 per cent. scabby. This unsprayed or check tree was perhaps the worst tree for scab in the district as the tree or orchard has not been sprayed for a number of years. There were sixteen trees in the sprayed plot."

Codling-moth Control.—Codling-moth is now found in practically all of the major fruit-growing districts of the Province. Control-work is being continued with a view to finding the best sprays for this pest both from the standpoint of cost and efficiency. Trials with different materials were again carried out in the Kelowna District under the supervision of Mr. B. Hoy, District Field Inspector. His report as submitted covers all the work done in detail. The following summary taken from his report will give a general idea of the situation, as well as the work which has been attempted:—

"Owing to the mild winter there was a greater number of over-wintering worms this spring than in any year since 1934. Weather conditions from the time the moths emerged

in spring until September were very favourable to the codling-moth. Appended to this report is a table showing the moth catches during July for the past five years from twelve pots located in the same trees throughout the period. You will note that many more moths were taken through the month of July of this year than ever before. (Appendix No. 4.)

"Though the weather was favourable to codling-moth development it was also good spraying weather, and better spraying was done than ever before. Many new high-powered sprayers were purchased; more sprays were applied and generally more care was taken in their application. This improvement in equipment and spraying methods is an indication that growers are becoming spray-conscious. Continued improvement and a further increase in up-to-date powerful equipment is needed. There are still many growers taking a heavy loss from codling-moth.

"This year's loss is about the same as last year. More lenient grading rules allowing stings on 'fancy' grade and a greater number on 'cee' permitted many apples to pass that would have been knocked down in grade or culled in former years. Thirty-two codling-moth bulletins were prepared by this office and broadcasted over CKOV.

"Besides the regular codling-moth broadcasts, this office co-operated with the B.C.F.G.A. and prepared two bulletins on codling-moth control that were mailed to every fruit-grower in the Interior, and a third on packing-house sanitation was sent out to every shipper.

"Spraying demonstrations, which give a more vivid picture of how spraying should be done than any verbal or written description, were held this spring at Westbank, Trepanier, Peachland, Naramata, and Summerland. These demonstrations were well received and a total of 230 fruit-growers attended.

"Spraying experiments to test some of the newer spray materials were conducted at East Kelowna and at Okanagan Mission. The following materials were tested: Black Leaf 155, Phenothiazine, Cryolite, and arsenate of lead. Some of these sprays, as the attached records will show, were used throughout the season and others in split spray schedules with arsenate of lead. In all cases results were checked with trees sprayed with arsenate of lead and Fluxit spreader throughout the season.

"It will be noted that all of the mixtures tried gave good control. Black Leaf 155 and Phenothiazine were equal if not slightly superior to arsenate of lead in killing codling-moth. Both of these sprays might be termed non-wash insecticides. The residue on the apple at the end of the season is not considered poisonous to humans. Unfortunately, both of these materials are more costly to spray with than arsenate of lead. Of the two Black Leaf 155 offers the more promise and may find a use in late sprays.

"Codling-moth bands were again used by many growers. To date there have been no complaints regarding their effectiveness and any examined were found to be satisfactory."

In the control of codling-moth the carry-over of larvæ in boxes presents a source of infestation which is of outstanding importance. The treatment of such boxes has been given consideration and the work carried out during the past season in the treatment of loose boxes in storage is well worth considering. The following dealing with this matter is taken from Mr. Murray's report:—

"Work was continued on the early season heating of packing-houses to speed up moth-emergence before the start of the season. In order to get a closer check on emergency dates under artificial heat, a number of trees were banded in August with ordinary burlap. These bands were left on the trees until December 8th, when they were placed in boxes in a large storage that was being filled with empty boxes (approximately 60,000 boxes were stored in this one room). As soon as heating was started, these bands were placed in boxes covered with cheese-cloth and the boxes put in various parts of the room, some on the floor, some in the centre, and some on top of the stacks of empty boxes. Thermometers were placed as near these boxes as possible, and a record of temperatures at these levels and locations was taken twice each day. The heating equipment consisted of a station-master type of coal heater and was located in one corner of the room, and an overhead circulating fan was hung from the ceiling a short distance away. It was hoped to start heating not later than May 1st, but due to several causes it was May 17th before anything could be done. Three days after heating was started, temperatures at all points were constant, and remained so until heating was discontinued on June 7th. Two weeks after heating commenced, the first moths began to appear, and increased at a very rapid rate. No attempt was made to count

these, however, as emergence began to fall off; the windows were covered with a heavy paper, except for a small hole about 12 by 24 inches, to allow enough light to attract the moths. These open spaces were gone over each day and the moths killed and counted. This was done until June 30th, when the boxes were taken to the orchards. Although the daily captures gradually lessened, a few were captured just before the boxes were moved. Had the heating been started even ten days earlier, it is reasonable to believe these boxes could have been completely cleaned of over-wintering worms.

"From this experiment it has been definitely shown that over-wintering worms in packing-houses and empty boxes can be made to emerge before any damage to fruit occurs. The expense was very small, as can be seen below. Under ordinary temperatures in packing-houses moths do emerge in large numbers before July 1st, but where large stacks of boxes are stored it is very doubtful if sufficiently high temperatures are reached without artificial heat to bring out more than a small percentage of the worms actually in boxes, so that even by holding back box distribution until midsummer a lot of worms would emerge in the orchards.

"The cost of pre-season heating would depend on the time of year it was done; that is, the earlier it was started the more fuel it would take to maintain temperatures; also the type of building used. A reasonably tight building would be very much easier to heat. The cost for fuel and labour, firing, taking out ashes, taking temperatures, etc., in this room holding 60,000 empty boxes was:—

Fuel, 5,350 lb. coal	$30.40
Labour	53.44
Total	$83.84

Cost per box, 0.139 cent."

European Red Mite Control.—European red mite is prevalent in the southern section of the Okanagan and its control in a satisfactory way is being worked on by both Dominion and Provincial officials. The co-operative control-work carried out this year is outlined as follows:—

"Further work was done on European red mite in co-operation with the Dominion Entomological Service. The situation at Kaleden during the early part of the season was serious, and in some orchards the leaves became quite light-coloured, especially Yellow Newtowns, Golden Delicious, pears and prunes. Due to the peculiar behaviour of the red mite, a spray programme that may give satisfactory results one year may be rather disappointing another season. For example, this season a very heavy infestation of European red mite was practically eliminated in prunes with one application of lime-sulphur 1–40 just before the blossoms opened, but pears in the next orchard sprayed with the same material a few days earlier gave practically no control. It was because of these circumstances that it was felt further work was necessary with the old materials, and at the same time try as many new materials as possible. The following materials were used: Elgetol and soluble sulphur for dormant spraying; commercial summer oil in comparison with home-mixed oil; Rotox with Stantex oil; cosmic sulphur and Santobane, No. 100. Elgetol and soluble sulphur were tried to see if these materials were as good or better than dormant oil or lime-sulphur for dormant spraying. A very heavily infested block of Yellow Newtowns was selected. The spray was applied just as the bud tips showed green or delayed dormant. Both materials were applied at recommended strength, Elgetol 1 per cent., soluble sulphur 10 lb. to 50 gallons of water. Although fair controls were obtained with soluble sulphur, there was still quite a large number of eggs hatched later in the season. Elgetol was apparently of no value in controlling European red mite. Only a very few eggs failed to hatch, and this may have been due to some other cause than the spray material used.

"*Summer Oils.*—Both home-mixed and commercial oils were tried, both oils having the same composition—namely, a straight cut oil with a viscosity 70–75 sec., sulphonation 90. This was applied at the usual recommended strength of 1 per cent. The home-mixed oil gave slightly better controls, but two sprays within five or six days of each other practically cleaned up severe infestations, using either material. The variation in controls with these two oils can be accounted for in the fact that the home-mixed oil contained almost 1 per cent.

actual oil, whereas the commercial oil only contained ¾ of 1 per cent. From the work done so far, 1-per-cent. summer oil has proved to be the easiest to use and has given better results than any other material tried. Cosmic sulphur was tried again this season with satisfactory results at a strength of 1–200. The results were about equal to summer oil. No injuries to fruit or foliage were observed, although this material was used during very high temperatures that for several days before and after spraying ranged around 90° F. The only objection to this material observed so far is that it is not recommended to be used with arsenate of lead, although no ill effects were observed when it was sprayed on trees already carrying a fairly heavy deposit of lead arsenate. The following table shows the results with the various materials used:—

Material.	Variety.	Date applied.	Date counted.	Leaves examined.	No. of Mites.
10-per-cent. home-mixed oil	Yellow Newtown	July 12	July 15	50	36
10-per-cent. home-mixed oil and Cryolite	Yellow Newtown	July 12	July 15	50	29
Cosmic sulphur, 1–200	Yellow Newtown	July 12	July 15	50	16
Stantex oil and Rotox, 1–100	Yellow Newtown	July 12	July 15	50	29
Santobane, 100*	Yellow Newtown	July 12	July 15	50	----
Water*	Yellow Newtown	July 12	July 15	50	7
Check	Yellow Newtown	July 12	July 15	50	147
10-per-cent. commercial summer oil	Yellow Newtown and Jonathan	July 20	July 22 and 27	50	29
Home-mixed oil	Yellow Newtown and Jonathan	July 20	July 22 and 27	50	22

* NOTE.—The Santobane 100 gave a very severe burning at the strength used. At a weaker dilution this material would probably have given satisfactory results. It is interesting to note that where water only was used, the best controls were obtained. No explanation can be offered at this time, and it is intended to repeat this spray during the coming season.

"On Winesaps at Kaleden, which developed red mite later in the season than the adjoining Newtowns, winter eggs were quite abundant. Commercial summer oil considerably reduced the mites but did not clean them up, due to poor application, so that a fair infestation can be expected next season. A comparison of egg-counts on devitalized trees (Newtowns) having a heavy early infestation, with Winesap trees having a heavy late infestation is interesting:—

Yellow Newtown—Number of buds, 50; eggs, 18.

Winesap—Number of buds, 50; eggs, 325.

"Apparently where early heavy infestations occur, feeding conditions become so poor the mites are starved out, and the largest percentage of winter eggs that may be laid under these conditions is apparently laid on the fruit, whereas on late infestations the trees are not so badly checked, feeding conditions are more nearly normal, and heavier deposits of eggs are made on the buds and twigs and fewer in comparison on the fruit."

Mealy-bug Control.—This insect is still an important tree-fruit pest in various Kootenay sections. Work to ascertain the best methods of control as carried out this year is a continuation of work which has been done in previous years. For your information the following is taken from the report of Mr. E. C. Hunt, District Horticulturist, and deals with the control-work undertaken during the past season:—

"Although this insect is still present in many Kootenay orchards, it did not cause the damage to the apple-crop this past season as in previous years. This was partly due to better spraying for its control and also to the very warm and dry weather that extended through all of September and well into October, which did not give the sooty fungus a chance to develop to a bad stage on the fruit.

"Four different spray materials for the control of the mealy bugs were tested out this past season at Harrop, B.C. The following materials were used in this experiment:—

"*Plot 1.*—Oliver's oil, 6 per cent. actual oil.

"*Plot 2.*—Stantex dispersing oil, 1 per cent. plus Rotenone 5 per cent. extract, ½ pint to 100 gallons, plus soap-flakes (Lux) at 2 lb. per 100 gallons.

"*Plot 3.*—Oliver's oil, 4 per cent. actual oil plus lime-sulphur 1 to 15.

"*Plot 4.*—Elgetol, 1 per cent. by weight (8 lb. to 80 gallons of water).

"Eighty gallons of spray was used on each plot and was applied on April 7th and when the trees were still in the dormant stage. The weather was fine and warm, but a little windy. A small Hardie spray-machine was used and the pressure was around 225 lb.

"On May 19th, 1938, a careful examination of the plots was made; the mealy bugs were full grown and easy to see. Counts were made on four 4-foot branches (with their offshoots and twigs) of two trees in each plot. An unsprayed tree was also counted. The following table shows the results of the counts:—

Plot 1.—Tree 1, 47 mealy bugs; Tree 2, 16 mealy bugs; total, 63 mealy bugs.
Plot 2.—Tree 1, 22 mealy bugs; Tree 2, 37 mealy bugs; total, 59 mealy bugs.
Plot 3.—Tree 1, 8 mealy bugs; Tree 2, 2 mealy bugs; total, 10 mealy bugs.
Plot 4.—Tree 1, 14 mealy bugs; Tree 2, 2 mealy bugs; total, 16 mealy bugs.
Check.—One tree: Branch 1, 132 mealy bugs; Branch 2, 181 mealy bugs; Branch 3, 405 mealy bugs; Branch 4, 104 mealy bugs. Total, 822 mealy bugs."

Tree-fruit Pollination.

The pollination of tree-fruits on a commercial scale has been undertaken in some orchards in the State of Washington. No extension-work of this kind has been undertaken in British Columbia. The removal of fillers as well as certain standard varieties from our orchards, together with the heavy spraying necessary for clean fruit but detrimental to apiculture, has led to some consideration being given to the possibilities of hand-pollination. During the past season some pollination-work has been done in the Penticton District.

A block of bearing Winesap trees in the Penticton District were, until a few years ago, filled with Jonathan. The fillers were pulled out, but good crops continued until a block of Jonathans a short distance away were taken out about four years ago. Since that time the Winesaps have failed to bear satisfactory crops. This spring, Mr. J. A. Smith hand-pollinated two branches, using McIntosh pollen on one branch and Jonathan on the other. These were the only two branches in the block of Winesaps that required propping. This work should be continued, as more and more orchards are being either top-worked to such varieties as Delicious or Winesaps, and such varieties as Jonathan, Winter Banana, Spitzenberg, and in some cases, McIntosh, that have been planted as fillers are being pulled out. With the heavier spray programme necessary it is almost impossible to keep bees in the orchard, so that pollination troubles will probably be on the increase.

REPORT OF PROVINCIAL PLANT PATHOLOGIST.

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

INTERPROVINCIAL QUARANTINE-WORK.

Special delivery tags, totalling 686, were issued to Prairie nurserymen during 1938, of which 525 have been accounted for to date. In addition, 100 tags were issued for greenhouse stock. Of the orders filled under these tags, 73 contained bulbs, 298 ornamentals, 119 tree-fruits, 140 small fruits, and 72 vegetables. In addition, 86 shipments not provided with tags were inspected at Vancouver. These were all small orders and many of them not commercial.

NEW DISEASES.

The only new disease to be reported is bean rust (*Uromyces appendiculatus* (Pers.) Lév.), which occurred in the bean plantings of two Japanese growers at Pitt Meadows. Whether this will prove a serious disease or not is difficult to forecast. Reports for Canada in the Dominion Plant Disease Survey do not indicate that it is destructive in Eastern Canada, where it is quite widely distributed. An American authority states: "In some of the South-western States and in California it causes considerable loss, but in the Northern States, especially in the dry-bean sections, the rust comes too late in the season to be destructive."

Downy mildew of spinach (*Peronospora effusa* (Grev.) Rabenh.) caused the loss of certain plots of spinach being grown in the Vancouver District for canning. Although the

plants had made good growth and produced an abundance of leaf-tissue, the presence of the mildew rendered them unsuitable for canning, thus destroying the commercial value of the crop. The fungus causing this disease has been occasionally found in spinach in the past and quite commonly on the weed Lamb's Quarters (*Chenopodium album*), but this is the first time it has been recorded as causing economic loss.

DISEASE SURVEYS.

Dr. Drayton, of the Dominion Plant Pathological Service, Ottawa, visited the Coast from April 6th to 21st to make an inquiry into bulb-growing in the Province from the standpoint of disease control and the desirability of instituting a system of certification. The Plant Pathologist accompanied the party for portions of the survey, both on Vancouver Island and in the Fraser Valley, and attended the subsequent discussions.

In consequence of complaints made by growers of small fruits in the Gibsons Landing District an inquiry was made into the causes of the decline in production, more particularly of strawberries, in this area. During May 18th, 19th, and 20th, practically all growers of any importance in the district from Hopkins Landing to Sechelt were visited. A detailed report was submitted to the Deputy Minister.

Owing to definite proof of the presence of a virus disease of cherries in the Kootenays, and the serious nature of certain other virus diseases of stone-fruits present in Western States, and which might have been introduced into this Province, the Dominion Government made arrangements for a tour of inspection of the fruit districts of British Columbia by Dr. D. G. Milbrath, Chief of the Bureau of Plant Pathology for the State of California. Dr. Milbrath spent from June 1st to June 11th at this work. Your Plant Pathologist accompanied him on the Vancouver Island and Okanagan portions of the tour and acted as guide in the Kootenays. It was satisfactory to find that Dr. Milbrath did not find evidence of any disease of known virus nature in either cherries or peaches in the Okanagan, including the Oliver and Osoyoos districts. The Kootenay position will be discussed later.

A review of the barberry situation in the Ladner District showed that stray barberries have been kept down on the railway right-of-way, and that the barberry hedge around a farm homestead about which complaints had been made has been completely removed. The only plants of common barberry now known to exist in the district are the few in the hedge of *Berberis Bealei* around the Ladner School.

Owing to the necessity of his absence in the East, Dr. McLarty, of the Dominion Pathological Laboratory of Summerland, arranged with me to make the plant-disease survey of the Dominion Experimental Station at Windermere, which I did July 21st and 22. This visit also gave me an opportunity to make some collections of weeds and other plants in the Cranbrook and Columbia Valley Districts.

VIRUS DISEASES OF CHERRY IN THE KOOTENAYS.

The disease known definitely to be of virus nature, and which is known as "mottle leaf" or mosaic, is chiefly confined to the City of Nelson, where the number of affected trees may reach a hundred or more. In the fruit districts, one tree has been located at Crawford Bay and two, or possibly more, contiguous trees at Boswell. The difficulty in carrying out an eradication campaign in the city is the great difference in the effects on the tree. Some trees give practically no yields and are obviously dying. There would probably be little opposition to having such trees destroyed. On the other hand trees with quite marked leaf symptoms are yielding heavy crops of fine fruit and it is difficult to convince the owner that such a tree is diseased and a menace to others. The great difficulty is the lack, as yet, of any easily applied objective test. Moreover, two trees in the city which showed typical leaf symptoms failed to give positive results when tested by budding on to seedling stock at the Saanichton Laboratory. In view of the somewhat isolated situation of the City of Nelson, in respect to the commercial fruit districts, the matter might be left to the judgment of the individual owner; but Dr. Milbrath in his observations found what he considered highly suspicious symptoms in the wild cherry (*Prunus emarginata*) in the vicinity of certain affected cherry-trees. According to Dr. Milbrath, it has been shown that this species is susceptible to the disease. It is widely distributed and abundant throughout the Kootenay country and should it become a reservoir of the disease this might have a serious effect on

cherry-growing. However, it does not seem desirable to undertake compulsory measures of eradication until we have some more objective means of diagnosis than exists at present.

It is interesting to note that a mild form of mottling found on winter-injured trees in 1937 had disappeared in 1938, confirming the supposition that there may be an association between winter-injury and a certain type of chlorosis. This also complicates the diagnosis of virus diseases. Specimens from such trees sent to the Saanichton Laboratory in 1937 also gave negative results for virus by budding tests.

A peculiar type of abnormality of cherry-trees in which the leaves become elongated, deeply and often irregularly indented, and asymmetric, has been observed for some time. The symptoms are quite different from those of typical mosaic. Dr. Milbrath was of the opinion that this condition was the same as one known as " crinkle " in California and which is considered to be genetic in character. Evidence confirming this was seen in the Okanagan, where buds or grafts from a normal tree had been worked on an abnormal one and the four-year-old limbs had remained normal. On the other hand, samples of " crinkle " sent to the Saanichton Laboratory in 1937 have given positive reaction for virus. As this virus has shown up as a mottling without malformation, however, it may occur independently of the " crinkle " in the same tree.

The peculiar trouble on Lambert cherries at Willow Point, in which the trees appear perfectly healthy and set heavy crops of fruit which, however, do not mature perfectly and are worthless commercially, was also brought to the attention of Dr. Milbrath. The trouble was, however, new to him, but he was able to say that it was definitely not " buckskin," a virus disease which causes marked abnormality in the fruit. Certainly the trouble has the appearance of being nutritional, but in addition to regular fertilizers, boron, zinc, copper, manganese, magnesium, and iron have now been applied with no results. The difficulty in making virus tests is, that, since the symptoms appear entirely in the fruit, healthy bearing trees would have to be used. Such are not available in the equipment of the pathological laboratories and a grower whose orchard is free from the condition would naturally be reluctant about having it introduced, if it should be a communicable disease.

HERBARIUM.

Some 1,500 sheets have been added to the herbarium, including a number of grasses which appear to be new records for the Province. A considerable number of specimens, some of them new or rare in the Province, others extending the range of a species, have been contributed to the herbaria of the Provincial Museum, the University of British Columbia, and the Division of Botany, Ottawa. Specimens of weeds, grasses, and poisonous plants have been contributed to the Provincial Field Crops Branch; Dominion Seed Laboratory, Vancouver; Dominion Range Experiment Sub-station, Kamloops; and the Ontario Veterinary College.

NEW WEEDS.

Hoary Alyssum (*Berteroa incana* (L.) D.C. Cruciferæ) was found to be quite abundant in and around grain-fields at Cascade and very abundant in an alfalfa-field at Spences Bridge. A few plants were also found along the roadside at Cisco and a solitary plant in an orchard at Creston. This plant is listed in the " Dominion Seeds Act " in Class 4 as a secondary noxious weed. It is an introduction from Europe.

Hound's Tongue (*Cynoglossum officinale* L. Boraginaceæ), a coarse biennial, was found to be very abundant from Anarchist Mountain, Osoyoos, to some distance east of Bridesville, centring around the latter place. It is somewhat surprising that a plant native to the moist climate of Western Europe should flourish so abundantly in a hot, dry district such as this. If it were confined to irrigated land there would be less reason for surprise, but it was plentiful along roadsides and in waste places, as well as under cultivation.

The above weeds are considered to be of sufficient importance to be included in the revised edition of Bulletin 106, now in preparation.

Viper's Bugloss, Blue-weed (*Echium vulgare* L. Boraginaceæ) was found escaping from gardens along the roadside at Merritt. This biennial has been found a troublesome weed under certain conditions in Eastern Canada.

Sun Spurge (*Euphorbia Helioscopia* L. Euphorbiaceæ) was found to be very thick along the roadsides near Windermere. This annual is usually of minor consequence, but judging

by its vigour as seen here it would seem to be capable of becoming a weed of some importance. This is another case of a native of Western Europe flourishing to an even greater degree under completely different conditions. It has been known as a casual weed in Victoria gardens for twenty years, but does not seem to have been reported from the Interior.

DISEASES STUDIED BY ASSISTANT PATHOLOGIST.

Certain plant diseases have been given special attention by W. R. Foster, M.Sc., Assistant Plant Pathologist, and these have been reported on as follows:—

Effect of Boron on Drought-spot of Bosc Pears, Saanichton, 1937 and 1938.

In the Okanagan Dr. H. R. McLarty found that a boron deficiency was the cause of drought-spot and corky core of apples and pears. Two years' results (Table 1) indicate that boron may not be the limiting factor under Coast conditions. Further tests, however, are necessary to make sure that the trees are getting the boron. Application by sprays will be made in 1939. The applications in 1937 and 1938 were made in March and February respectively.

Table 1.

Plot No.	Treatment.	Rate per Tree.	Degree of Infection.				Number of Fruit examined.
			Free.	Slight.	Medium.	Severe.	
1937		Oz.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	
1	No treatment	...	69.2	21.0	9.8	...	361
2	Borax	8	79.3	16.4	2.7	1.6	445
3	Borax	16	65.9	24.2	9.9	...	470
4	Boric acid	6	80.3	13.8	2.2	3.7	405
1938							
1	No treatment	...	72.9	14.9	7.3	4.9	2,138
2	Borax	8	81.5	10.2	5.1	3.2	1,995
3	Borax	16	77.0	11.8	5.9	5.3	2,268
4	Boric acid	6	75.0	9.4	7.2	8.4	1,727

Dry-berry of Loganberry and Raspberry.

Seven hundred loganberry seedlings were tested for their resistance to the dry-berry disease. Unfortunately, not one of the seedlings showed sufficient resistance to be of practical importance.

For the first time crosses were made. Hybrids of loganberry x Cuthbert raspberry and loganberry x boysenberry are growing well in the greenhouse. The Cuthbert raspberry is practically immune to this disease and the boysenberry has shown some resistance. About three years, however, will be necessary before their susceptibility to dry-berry can be determined.

Malformation in Gravenstein Apple-trees.

A peculiar malformation, or distortion, of both trunks and branches of the Gravenstein apple in British Columbia appears to be caused by a virus. The growth from six healthy scions grafted on a malformed Gravenstein tree developed typical symptoms. A pitted condition was first noticeable in the second year with very marked malformation in the third year. Scions from the malformed tree were placed on a healthy one, but the growth so far has been too slow to show very definite symptoms. No organism, bacterial or fungus, has been found associated with this trouble. "Flat limb" is the name proposed for the disease. It has been found at Nanaimo, Terrace, and Vancouver, British Columbia.

Wheat Midge.

The wheat midge has been causing considerable damage to spring wheats in many of the Coastal districts of British Columbia for many years. The midge in its orange to yellow maggot stage sucks the milky juice from the young kernels, causing the grain to shrivel and the head to blight and be imperfectly filled.

Every effort should be made to grow early-maturing winter wheat varieties like Dawson's Golden Chaff or Red Rock which completely escape midge damage and are better adapted to Coast conditions than spring wheat. The average yields of Dawson's Golden Chaff or Red Rock winter wheats have been much higher than spring wheats.

If a farmer desires to grow spring wheat and his land is well drained he should seed (according to Mr. R. Glendenning's results, as given in correspondence with him) an early maturing variety like Reward or Marquis before the plum-trees bloom. (European varieties such as Grand Duke, Victoria, etc.)

Unfortunately, a considerable number of farmers cannot seed either winter wheat or spring wheat before the plum-trees bloom owing to poorly drained land. In an attempt to find a variety which would resist the infestation of the midge, thirty-five varieties supplied by Mr. L. H. Newman, Dominion Cerealist, were grown on a farm at Cedar, Vancouver Island. Only one variety of the thirty-five—Kota, with 47.2 per cent.—had less than 100 per cent. of the heads attacked. Further work will be required to determine the importance of this apparent resistance. The following are the varieties which were 100-per-cent. attacked: Apex, Aurore, Bishop, Brownie, Canus, Ceres, Coronation, Dicklow, Early Red Fife, Early Triumph, Federation, Florence, Ford, Garnet, Goose, Jenkins, Kubanka, Marquis, Mindum, Nabawa, Nubriggn, Onas, Pacific Blue Stem, Pelcraw, Pioneer, Prelude, Quality, Red Bobs, Red Fife, Reliance, Renown, Reward, and Supreme.

Holly-leaf Defoliation in Storage.

During the Christmas season of 1937, a number of importers of English holly from British Columbia into Ontario and Quebec complained about its unsaleability owing to a leaf-drop. This leaf-drop or defoliation is the separation of the leaf from the stem at the abscession layer. The following experiment was therefore made:—

Slightly over 100 lb. of holly was cut from holly-trees free from leaf-drop. In order to get a representative sample, the holly was mixed as much as possible at the plantation and again when packing. Twenty cardboard cartons, 16 by 16 by 18 inches, similar to those used by the trade, were lined with different kinds of paper—namely, (1) wax-paper, used in shipping for the first time in 1937 and the kind of lining used on shipments complained about, (2) heavy brown wrapping-paper, and (3) newspaper. Five pounds of holly was placed in each lined carton. The cartons were then sealed and cracks stopped with glued paper strips. To four of the cartons lined with heavy wax-paper, distilled water was added in quantities of 50 c.c. each for two cartons and 200 c.c. each for the other two. For two others, wrapped in heavy wax-paper, carbon dioxide was added for ten minutes each. Every treatment was replicated and the cartons stored for two weeks at temperatures of 45° and 70° F.

Results.—Holly-leaf drop took place only in cartons lined with waxed paper. Holly in ten cartons lined with waxed paper and stored at about 70° F. dropped its leaves, while that in four cartons lined with brown paper or newspaper had no defoliation. In the cartons lined with waxed paper there was a considerable amount of moisture condensed on the lining when the cartons were first opened up, while there was none in those lined with brown wrapping or newspaper. Although there was no defoliation in those lined with brown wrapping or newspaper the holly was too dry and the colour was slightly faded. No leaf-drop took place when the cartons were stored below 45° F. for two weeks regardless of how they were lined. The holly was also in excellent condition.

Recommendations.—English holly should be kept cool in storage at all times, at a temperature of 32° to 40° F. (Table 2). If there is any possibility of temperatures higher than 50° F. the carton should not be lined with waxed paper.

Table 2.

Lining.	Temperature.	Leaf-drop.	Colour.	Moisture Content.	Sale-able.
	Degrees F.	Per Cent.			
Heavy brown paper	45	0.0	Very good.	Very good.	Yes.
Heavy brown paper	70	0.0	Slightly faded.	Too dry.	No.
Newspaper	45	0.0	Very good.	Very good.	Yes.
Newspaper	70	0.0	Slightly faded.	Too dry.	No.
Light waxed paper	45	0.0	Very good.	Very good.	Yes.
Light waxed paper	70	80.0+	Poor.	Too Wet.	No.
Heavy waxed paper	70	80.0+	Poor.	Too Wet.	No.
Heavy waxed paper plus 50 cc. water	70	100.0	Very poor.	Too Wet.	No.
Heavy waxed paper plus 200 cc. water	70	100.0	Very poor.	Too Wet.	No.
Heavy waxed paper plus CO_2 for ten minutes	70	100.0	Very poor.	Too Wet.	No.
Unwrapped	70	0.0	Faded.	Too Dry.	No.

In this connection the following note may also be of interest: Elmer Hansen and Henry Hartman, of Oregon State College, have found that the presence of ripening fruit in storage may cause holly to drop its leaves. They even go so far as to advise against shipping holly in a car which has recently held apples or pears. Ripe apples and pears give off a gas, ethylene, which can defoliate holly at a concentration of about 1 part in 10,000,000 of air.

Pear-scab Control.

In 1936 a pear-scab control investigation was started with the co-operation of the Experimental Station at Saanichton. The object was to determine the relative effectiveness of new sprays against the standard lime-sulphur. The results for 1937 and 1938 are given in Tables 3 and 4. A summary of results for 1936, 1937, and 1938 are given in Table 5.

Both Bouisol and lime-sulphur are satisfactory fungicides for pear-scab under Coastal conditions. Three applications, pink, calyx, and three weeks after, are all that are necessary in an average year. Occasionally, with a wet June, a fourth spray is necessary. Throughout this experiment every second row of pears was left unsprayed in order to have an abundance of inoculum. In another portion of the orchard where no unsprayed rows were left the sprays gave a greater than 95 per cent. effectiveness.

Table 3.—The Effect of Different Fungicides on the Control of Pear-scab, Saanichton, 1937.

Plot No.	Treatment.	No. of Fruit inspected.	Degree of Infection.			Fruit Marketable.
			Free.	Slight.	Severe.	
			Per Cent.	Per Cent.	Per Cent.	Per Cent.
1	Lime-sulphur	2,365	57.4	22.0	20.6	79.4
2	Bouisol	1,440	44.0	28.6	27.4	72.6
3	Bordeaux	1,582	53.8	23.7	22.5	77.5
4	No treatment	1,949	11.4	29.7	58.9	41.1

Table 4.—The Effect of Different Fungicides on the Control of Pear-scab, Saanichton, 1938.

Spray Material.	Concentration.	Fruit examined.	Degree of Infection.				Fruit Marketable.
			Free.	Slight.	Medium.	Severe.	
			Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.
Lime-sulphur	1–40 gals. water	5,561	66.8	13.8	9.4	10.0	80.6
Bouisol	5 lb.–100 gals.	4,247	63.4	19.3	9.7	7.6	82.7
Bordeaux	4–4–40	5,054	65.6	17.1	10.5	6.8	80.1
No treatment		4,814	18.1	22.6	26.7	32.6	58.9

Table 5.—Summary for 1936, 1937, 1938.

Plot No.	Treatment.	No. of Fruit.	Percentage Marketable.			Average.
			1936.	1937.	1938.	
1	Lime-sulphur	12,306	94.9	79.4	80.6	84.6
2	Bouisol	10,134	99.4	72.6	82.7	84.9
3	Sulsol	4,026	97.2	-----	-----	-----
4	Bordeaux	6,636	-----	77.5	82.7	80.1
5	No treatment	11,339	94.9	41.1	40.7	58.9

Free: No scab.
Slight: Up to aggregate of ½ inch in diameter.
Medium: From ½ inch to 1 inch diameter in aggregate.
Severe: Over 1 inch in diameter.

Creston Wheat Problem.

In the Reclamation area lack of kernel development in some of the spikelets of the wheat-heads appears to cause considerable loss. In one case, a 2,000-acre field, the loss was estimated at between 30 to 40 per cent.

Preliminary investigations suggest that the cause is physiological and probably nutritional. Ten analyses by the Spurway system indicate that the available phosphates are very low. An indication of boron deficiency in certain other species of plants was also observed in the Creston District. A series of fertilizer tests has been outlined for the spring of 1939.

Bunt in Northern Okanagan.

Ridit, one of the varieties resistant to bunt which we have tested for seven years, has been licensed by the Dominion Government. Ridit is becoming of increasing importance to the Northern Okanagan and also to the Creston area.

Little comment is necessary on the results given in Table 6 of the yield and percentage of bunt of different varieties of winter wheat grown at Armstrong, B.C., in the fall and spring of 1937 and 1938 respectively. The season was dryer than usual, and two varieties—Hussar and Triplet x White Odessa—proved to be fairly drought-resistant.

Table 6.

Variety.	Percentage Bunt.	Yield in Bushels per Acre.
Jones Fife	41.5	19.1
Hussar	0.4	43.9
Jenkins x Ridit	0.3	27.4
Honhenheimer x White Odessa (130)	0.0	21.7
Hymar	0.0	34.0
Oro	5.9	28.2
Rex	0.1	29.6
Ridit x Utah Kanred	3.0	29.6
Triplet x White Odessa	0.1	43.9
White Odessa x Hard Federation	0.0	32.6
Ridit	0.1	40.0

The following scientific papers were published during 1938:—

Foster, W. R.: Control of Snapdragon Rust (*Puccinia antirrhini*). Scientific Agric. 18. 524–526.

Dearness, John, and Foster, W. R.: Coniosporium disease of Apples and Crabapples. Can. Jour. of Research 16. 274–276.

REPORT OF PROVINCIAL ENTOMOLOGIST.

MAX H. RUHMANN, B.A., ENTOMOLOGIST.

The weather in the Interior during the year was unusually warm and dry, high temperatures being maintained until late in the fall. In consequence, the activities of many insect species were more pronounced than usual and brood development more rapid.

San Jose Scale (Aspidiotus perniciosus).—During April and May the infested areas of Cawston, Keremeos, and Kaslo were examined. A slight extension of the infested area was noted at Kaslo. The Cawston and Keremeos areas were again examined in October by Mr. E. P. Venables, of the Dominion Entomological Staff, and myself. The infestation was found to have extended into ten orchards not previously infested. This scale was again reported from the Osoyoos District. Infestations were also recorded at Penticton and Kelowna this fall.

Codling-moth (Carpocapsa pomonella).—Due to climatic conditions during 1938, the development of this insect was more rapid than usual. The emergence of the second-brood moth was much earlier than any previous record in the Interior, making it necessary to apply the first cover-spray for the second brood by the middle of July, and the warm weather extending into late fall caused an unusually heavy infestation of the second brood, resulting in severe losses in some orchards.

Colorado Potato-beetle (Leptinotarsa decimlineata).—The outbreak of 1936 at Grand Forks has been considerably reduced, with the possibility of complete eradication during 1939. This will, to some extent, depend on the co-operation of the potato-growers through their aid in examining their own potato-crop and report infestation. A detailed report on the Colorado potato situation in the Grand Forks area was submitted earlier in the year.

Tarnished Plant-bug (Lygus pratensis).—Considerable loss through "cat facing" caused by this insect was noted in the Oliver District.

Wireworms (Elateridae).—Considerable loss of truck and field crops is noted yearly. Losses were particularly high in the Grand Forks potato-crop during 1937 and 1938.

Fall Web-worm (Hyphantria cunea).—Although orchards were comparatively free of this insect, due to general spraying, choke-cherries and alder were severely defoliated. Although this insect has been unusually plentiful for several years no evidence of parasitism was noted.

Buffalo Tree-hopper (Ceresa bubalis).—Injury from this insect is quite severe at Keremeos.

European Fruit-scale (Aspidiotus ostreaeformis).—The distribution of this scale is quite general in the fruit areas of the Okanagan and particularly numerous at Keremeos. In the latter district, due to the application of dormant sprays, it is now being considerably reduced.

Imported Cabbage-worm (Pieris rapae).—A severe infestation of this insect was noted at Grand Forks.

Cabbage-maggot (Hylemyia brassicae).—Considerable injury was noted generally.

Onion-maggot (Hylemyia antiqua).—Losses through this insect were much lower than usual.

REPORT OF PROVINCIAL APIARIST.

A. W. FINLAY, APIARIST.

The season of 1938 was generally satisfactory in every respect to bee-keepers in all parts of the Province. No severe weather conditions, unfavourable to the bees, were encountered during the preceding winter and colony losses were lighter than usual, not exceeding 15 per cent., and this due chiefly to tardiness in replacing failing queens. Early spring examinations found most colonies to be short of stores but fair to good in strength, so that an early honey-flow from dandelion, with favourable weather at the time, was welcome as a stimulant to continued brood-rearing and replenishment of stores.

Cool and wet weather during mid-April checked brood-rearing and caused considerable trouble in requeening. Reports of queen losses were general, as most of the queens imported for replacements are received at this time. With favourable weather towards the end of

April, normal conditions were resumed. A few wet and cloudy days during May, when colonies were fairly strong, resulted in congestion of bees in the hives followed by excessive swarming. The remainder of the summer was exceptionally dry and warm, so much so that nectar-secreting plants on high lands and thin soils dried up to the extent that the honey-flow was very slow.

Scale hive records in Lower Mainland Districts showed a gain of only 1 to 2 lb. a day from main-crop sources, but as this light honey-flow continued without interruption over a long period the aggregate surplus crop was quite satisfactory. In the irrigated districts of the Interior, where ground-moisture was plentiful, the long continued dry weather with high temperature was conducive to nectar-secretion and record honey-crops were obtained in many apiaries, some bee-keepers reporting the best crop they had experienced for many years. In the orchard districts the loss of bees as a result of arsenical spraying of fruit-trees was very much lighter than usual, undoubtedly owing to rapid drying conditions, as heavy losses in previous years were distinctly traceable to humidity and cloudy weather following the application of such sprays. Commercial bee-keepers in the orchard districts have, in recent years, moved their apiaries away from the vicinity of fruit-trees to an increasing extent, owing to heavy losses from spray poisoning. The result in the imperfect pollination of fruit-trees, especially stone-fruits, has been so noticeable that many orchardists are now hiring colonies to be placed on their lands during fruit-bloom. The usual rate paid for bees is about $20 for a unit of six colonies. They are left in the orchards for from two to three weeks, when, by previous agreement, the bee-keeper is notified to move the bees to safety a few days in advance of application of the calyx-spray. Hundreds of colonies are hired in this manner and the practice appears to be rapidly growing, with mutual benefit to bee-keepers and orchardists.

A very good honey-crop was obtained on Vancouver Island in the logged-off areas, where fireweed yielded steadily in spite of extremely dry conditions. Forest fires and a heavy pall of smoke interfered with the bees to some extent, but no loss of colonies from fire were reported, though some hives had to be moved to safety. Migratory bee-keeping to the fireweed districts is steadily increasing on the Island, and the recent bush fires will add considerably to the area occupied by this plant, which appears to thrive on the deposit of potash left by such fires until it is crowded out by other growths.

The total honey-crop for the Province is estimated at 1,584,120 lb., an increase of 156,664 lb. over the good crop of last season and a record for the Province to date. The quality is excellent and will mostly grade No. 1 light.

THE HONEY MARKET.

It was anticipated that the action of the Board of Railway Commissioners for Canada, in granting special freight rate privileges on honey shipped to the Vancouver market from Winnipeg over a year ago, would seriously affect the wholesale price of British Columbia honey on the home market. From reports received so far this season, commercial producers in this Province disposed of about 50 per cent. of their crop on the early market at the usual price. Later sales, however, were made at from ½ to 1 cent. less when they had to meet the competition of consignments from Alberta and Manitoba as they appeared on the market.

As the larger consignments of honey from the Prairie Provinces usually arrive about a month to six weeks later than our local product is available, it would appear advisable for British Columbia bee-keepers to prepare their honey for market as soon as possible after the close of the season, so that orders may be filled for replenishment of merchants' stocks, as far as possible, ahead of the arrival of competitive imports.

FIELD-WORK.

District Apiary Inspectors made excellent progress in early spring examination of colonies for the control of contagious bee-diseases, with very little interruption from inclement weather. Systematic inspection of apiaries usually extends from the beginning of April to the end of August, but many emergency cases and special calls for inspection are attended to before and after these dates. The steady favourable weather throughout the summer enabled the staff to examine almost 2,000 more colonies this season than last, and it was very satis-

factory to note that, regardless of the increased number of colonies inspected, the number of cases of disease found was about 20 per cent. less than last year.

The attendance of your Provincial Apiarist, usually with the District Inspector, at bee-keepers' field-days held throughout the summer at various points was appreciated by bee-keepers, and opportunity was generally taken at these meetings to demonstrate practical methods in the manipulation of colonies for honey production and other matters of educational interest, including the diagnosis and treatment of diseases.

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

Inspector.	District.	Examined.		A.F.B.	E.F.B.
		Apiaries.	Colonies.		
A. W. Finlay	General	121	2,701	32	12
W. J. H. Dicks	Greater Vancouver	261	824	31	3
E. R. Freeman	Lower Fraser Valley	472	2,215	201	7
John Gillespie	Vancouver Island	128	843	12	10
H. L. Johnson	Chilliwack-Sumas	259	1,214	38	10
J. F. Roberts	Okanagan	212	2,077	61	...
J. A. Smith	South Okanagan	9	98	12	...
Totals, 1938		1,462	9,972	387	42
Totals, 1937		1,485	8,002	548	55

The annual check-up on apiaries in districts where no resident Apiary Inspector was employed was carried out as usual with the assistance of various District Representatives of the Department. On Vancouver Island, from Nanaimo to Menzies Bay, bees were found to be in excellent shape, due to favourable wintering conditions, and entirely free from disease. Some evidence of careless bee-keeping was found in the appearance of scattered and neglected equipment, explained by the owners to discouragement after depredations of bears the previous season. On the other hand, several well-attended apiaries of neat appearance were found, where previous success had encouraged their expansion to commercial proportions.

In the Lytton, Ashcroft, Lillooet Districts, where the few commercial bee-keepers average about 200 colonies each, excellent conditions of the bees and fully modern equipment indicated a successful season which later reports verified. No disease was found here or in the Kamloops and surrounding territory. In the Okanagan Valley, many of the larger apiaries were visited during June. Prominent bee-keepers reported that bees were never in better shape at that time, and this condition appeared general, with a considerable improvement in the disease situation.

From Penticton south, in company with Inspector John A. Smith, a number of apiaries were examined in the Cawston, Keremeos, and Oliver Districts. Colony conditions were found to be generally good, with bee-keepers anticipating a good crop should their bees escape the ever-present menace of loss from arsenical-spray poison.

The Kootenay Valley was visited towards the end of June, and favourable conditions for bee-keeping noted from Nelson to Creston. Some time was spent in the Creston area where a complete inspection and check-up was made of all bee-keepers in the district, covering forty-two apiaries. Disease was found in two places only and the eight colonies affected were promptly destroyed.

REPORT OF CHIEF VETERINARY INSPECTOR.

ANSON KNIGHT, V.S., CHIEF VETERINARIAN.

During the year a number of infectious and contagious diseases have been dealt with by your Inspectors. A number of these diseases are not listed under the "Contagious Diseases (Animals) Act," but if not brought under control would entail considerable losses to the farmers and live-stock men throughout the Province. For such diseases as hæmorrhagic septicæmia and blackleg, which have been somewhat prevalent during the year in various sections of this Province, the farmers have been obliged to use prophylactic measures by way of vaccines and serums.

Throughout the pasturage season we have found all classes of live stock in fair to good condition. Pasturage on the ranges, especially in the Lower Okanagan and Chilcotin, has been somewhat short, but throughout the Nechako-Bulkley Valley and Lakes area the pasturage has been good. The result has been that the majority of cattle have gone on the market in good condition. Throughout the northern section, including Central British Columbia, the grain and hay crops are particularly light. There has been a tendency on the part of the beefmen to sell off their younger cattle to cut down on the numbers of cattle that would otherwise have been wintered. This policy has entailed the shipping of a number of good breeding heifers which would otherwise have been kept for grading and breeding in the beef herds throughout Central British Columbia.

In the Peace Block there is a tendency to increase the swine population, at the same time keeping up the quality. This is particularly noticeable north of the Peace River, where the grain has to be hauled long distances. They have found it to their advantage to feed the grain and ship hogs. With the present prices for hogs this has given them good returns for their wheat and other grains. The quality of the hogs is well maintained, and the percentage of select bacons is on a par with the older sections of the Prairie Provinces. The number of sheep kept throughout the Cariboo, Central British Columbia, and the Peace River Block has not increased, but I note that at present there is a better quality of breeding stock in service and, therefore, we may look for the maintenance of quality in the future.

Report on the diseases that your Veterinary Branch has had to deal with throughout the year follows:—

FOOT-ROT.

This disease is almost entirely confined to the Interior of British Columbia or probably more particularly the Okanagan Valley, where 17,000 head of sheep have been looked over during the last year. This disease has been causing considerable trouble owing to infected ranges. After treating the sheep and getting them in good condition, by utilizing contaminated range and other ground the sheep become reinfected. If this disease is to be cleared up amongst our Interior sheep it would be well to prevent sheep from running on certain ranges, or hold these ranges in abeyance for pasturage purposes for a period of two or three years when there is a chance of the virus causing the disease to die out. This disease has not been reported to your Veterinary Staff along the Coast regions or Lower Fraser Valley, nor throughout the Chilcotin, Cariboo, or Central British Columbia.

PULMONARY EDEMA.

Dr. D. H. McKay reports that he was called to farms situated at Monte Lake and Falkland and found the cattle dying from pulmonary edema. The parties were advised to use the pulmonary mixed bacterin as a preventive measure. No further cases were reported.

COCCIDIOSIS.

Only one outbreak of this disease was reported in the neighbourhood of Falkland. Medical treatment was advised and apparently no further losses occurred.

HÆMORRHAGIC SEPTICÆMIA.

This disease takes a slight toll of our cattle almost every year. A small outbreak occurred on Vancouver Island, where five out of seven head of dairy cattle died. In this connection I may say that these cattle were recently brought in from Alberta. Shipping and climatic conditions no doubt had an effect on the cattle; hence the heavy percentage of losses. Also, an outbreak occurred in the Voght Valley, where the loss of thirty-one head of cattle was reported. This disease is not listed under the "Contagious Diseases (Animals) Act," but the advice was given to the owners of cattle as to the control and elimination of this disease by using the bacterins and segregating infected cattle and the burning of the carcasses.

BLACKLEG.

A small number of young cattle were lost owing to the onslaught of this disease. In such districts where it is likely to occur, many live-stock men adopt the practice of inoculating with blackleg aggressin all stock under two years of age. This method has proven very effective. All cattle dying of this disease were burnt on the spot.

STERCOREMIA.

This disease is due to dietary troubles or faulty feeding, caused by the absorption of toxins in the system. It usually occurs amongst ewes fed on coarse fodder with lack of exercise. Advice as to the handling of breeding ewes was given and also medical treatment.

CASEOUS LYMPHADENITIS.

This disease is caused by the bacillus of Prisz affecting old sheep. This disease was brought to our notice through a shipment of 112 head shipped to a packing-house in Vancouver, thirty carcasses out of 112 showing evidence of this disease. This disease does not necessarily cause loss of the entire carcass unless the animal is somewhat emaciated through the onslaught of the disease. It generally affects the glands of the body. Lambs are not affected.

PLANT-POISONING.

Some losses amongst cattle dying from the poisonous effects of eating larkspur occurred in the Stump Lake area and also at Aspen Grove. The poisonous ingredients of this plant work very rapidly and animals respond very slowly to medical treatment. This is almost impossible with cattle poisoned on the ranges as they are not under daily observation. Annual loss also occurs from this plant throughout the Nechaco, Bulkley Valley, and Lakes area, where the plant is very prevalent. The losses in the lower part of the Province this year were no doubt due to the lack of other forage-plants during the excessively dry pasturage season. Where other feed is plentiful there is little tendency throughout the summer months for the cattle to eat this plant. A few losses also occurred from water hemlock, which is quite common throughout Central British Columbia.

PARASITES.

Very little trouble was reported by sheep-owners due to the losses occurring through internal parasites. Your Inspectors have year after year endeavoured to instruct the sheepmen as to the proper medical treatment of sheep and lambs affected. Also addresses have been given by your staff to Farmers' Institutes. This has had the effect of the farmers treating and handling their sheep in a proper manner. In looking over a large number of sheep no evidence of internal parasites has been noticed this year. The proper control and handling of pasture ground is also a double check on controlling such parasitic troubles.

ENCEPHALOMYELITIS.

An outbreak of this disease occurred for the first time to our knowledge in the lower part of the Eastern section of the Province in the vicinity of the Kootenays. No outbreaks occurred in Central British Columbia, nor was there definite proof of the disease in the Peace River Block. A number of cases occurred in Northern Alberta within a few miles of the Alberta-British Columbia Boundary.

While in the Peace River Block my attention was directed to a number of suspected cases of this disease, but on investigation I found these to be quite ordinary farm troubles. Particularly noticeable in this respect were cases of horses affected with swamp fever. A peculiar factor in the onslaught of any disease is the psychological aspect in the minds of the people. In a number of instances where ordinary farm troubles would not cause them any concern, this year, owing to the prevalence of encephalomyelitis and the advertising occurring in the daily papers, it led people to suspect almost any ordinary disease to be the disease in question. This entailed considerable mileage and trouble in investigating such reported cases.

This is a preventable disease; therefore the farmer to protect his horses can make use of the vaccine which has proved its efficiency both in the United States and throughout Canada. I believe in the United States and by the report of the Montana Station that the question of quarantining diseased animals has not proven very effective in checking the trouble. We are working somewhat in the dark as to the intermediary agent or carrier of the disease. If it is due to ticks, flies, mosquitoes, or any other biting-insect over which we have no control, the question of quarantine would not prove effective. In my visits throughout Northern Alberta in looking into a number of cases I found that where horses were in

a band of ten or twelve one or two of them would show symptoms of the disease, the others remaining perfectly healthy. In some of these cases no check or quarantine measures were adopted, and yet the balance of the horses remained in a healthy condition.

There is considerable investigational work being carried on by the various Governments throughout North America, and it may prove in time that the carrier of the disease will be found. We, however, have diseases which are perhaps more fatal than encephalomyelitis, such as hæmorrhagic septicæmia and blackleg, and in these diseases the prophylactic measures are left with the stock-owner.

Herewith Dr. J. D. Macdonald's report setting out his work with this disease in the Kootenay district is attached.

"EQUINE ENCEPHALOMYELITIS.

"This disease broke out in the Kootenays during last summer, and undoubtedly came in from affected horses, etc., and has also been rife in Alberta and Montana for the last few years. Attached is a summary of places and districts affected, and number of animals involved:—

July to October, 1938—East Kootenay.

District.	Total reported.	Likely not diseased.	Animals diseased.	Died of Disease.	Animals recovered.	Total dead.
Hosmer	4	2	2	1	1	3
West Fernie	4	----	4	2	2	2
Baynes Lake	2	----	2	2	----	2
Waldo	1	----	1	1	----	1
Galloway	1	1	----	----	----	1
Cranbrook	1	----	1	----	1	----
Lumberton	2	----	2	2	----	2
Tata Creek	1	----	1	1	----	1
Creston	3	2	1	1	----	3
Wynndell	1	----	1	----	1	----
Wilmer	2	2	----	----	----	2
Golden	4	----	4	3	1	3
Nelson	1	1	----	----	----	1
Totals	27	8	19	13	6	21

"In addition to the twenty-seven cases reported there is no doubt that other deaths from the disease have occurred. Also, in formulating the above list, it would not be wise to disregard the possibility that some listed as "Likely not diseased" were also diseased. Every endeavour was made to ascertain and sift all evidence, symptoms, and history in each case. Those seen alive and listed as recovered were mostly treated at the outset of the disease, and there is no doubt that treatment and care at the early stages would prevent such a high mortality as at present. There is a danger, however, that a recovered horse may be actually dangerous to other horses in spreading the disease. Also, although temperature of recovered horses showed normal, there was noticed a certain change in condition, with a tendency to put on fat and a general bogginess; and it is doubtful if a horse once sick with the disease ever really does recover."

TUBERCULOSIS.

This year a slight increase in the number of reactors to the tuberculin test is reported. During the year your Inspectors visited 1,025 premises and inspected 10,681 cattle, in which there were 104 reactors. The majority of these reactors occurred in three or four herds. One herd in the vicinity of Victoria accounted for 47 out of the 104. These diseased herds have been retested within the past two months and at the present time are showing no reactors. Both the East and West Kootenays have proven to be quite free of the disease, and also the Interior points in the vicinity of Kamloops, Ashcroft, and points south.

Your Inspectors are endeavouring to keep a close check-up on any herd where reactors are found, and it is to be hoped that these will show a clean bill of health during the coming year. A large herd affected in the vicinity of Victoria appeared to be of a very virulent type and spread quite rapidly through the herd, necessitating considerable loss to the owner.

In the matter of inspection of dairy premises, your Inspectors report that there has been a gradual improvement within the last few years. You will note on the list of premises inspected that a considerable number are ungraded. These apply very largely to parties keeping cows for private use and not retailing to the public.

The demand for T.B.-testing and inspection of dairy premises, and also the call on your Veterinary Inspectors concerning certain diseases of an infectious nature, has kept your staff more than fully employed throughout the year.

Summary of districts visited, cattle inspected, and premises graded, together with a summary of T.B.-testing for the year from December 1st, 1937, to November 30th, 1938, appear in Appendix 5 and 6. Details are on file in the office at Victoria.

REPORT OF DAIRY BRANCH.

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

Milk production has been surprisingly good in view of the intense drought experienced in most areas, and an actual increase in total production over that of 1937 will be recorded. Prices have again dropped due, undoubtedly, to the presence in Canada of surplus stocks of creamery butter. Dairy crops in general suffered in yields and stocks of foodstuffs are sufficiently low to occasion misgivings for the rest of the winter.

DAIRY-FACTORIES.

Twenty-seven butter-factories, three cheese-factories, two condenseries, one milk-powder plant, and one casein plant have operated during the year. A cheese-factory commenced manufacture at Armstrong and appears to have had a successful season. Several creameries, in addition to butter, manufacture ice-cream for the wholesale trade; a few establishments specialize in this, and numerous small plants manufacture and retail. All factories and milk plants have been called on regularly by officials of this branch. Equipment and methods pertaining to grading and testing of milk and cream supplies have been carefully checked and results of check-tests have been periodically forwarded to producers. Matters relating to sanitation and storage have been discussed and inspections and recommendations made.

CREAMERIES.

About 5 per cent. more creamery butter has been made than during the season preceding. Rapid increase in total manufactured is unlikely, considering the diversion of supplies to other channels.

CHEESE.

A large percentage increase in cheese manufacture has occurred with the opening of a factory at Armstrong. The variety made is a Cheddar or ordinary Canadian which seems to have been very favourably received by the market. Cheddar cheese is also made near Vancouver, and one or two Italian varieties at a factory at Chilliwack.

CONDENSED PRODUCTS.

An increase in the evaporated-milk production of the year took place, the somewhat improved price being mainly responsible. The amounts of milk-powder (skim) and of casein produced are slightly greater than heretofore.

ICE-CREAM.

The season, on the whole, was favourable to the manufacture of ice-cream and more was produced. There appears to be a gradual diminution in number of small country plants, the wholesalers of Vancouver reaching up great distances into the Interior. For the investment needed, this phase of dairy manufacturing is rather at the mercy of season and climate.

HERD IMPROVEMENT.

There are in operation, fourteen Cow-testing Associations with eighteen routes. A total of nearly 8,000 cows is on test regularly under the system. The average butter-fat yield of

all completed lactation periods during 1938 reached 353 lb. for the first time since the recession in yield that commenced with 1933 due to retrenchment in feeding. While it is difficult to estimate accurately the financial benefit of Cow-testing Associations to British Columbia during the twenty-five years that have elapsed since their institution under the Provincial Dairy Branch, there is good reason to believe that dairy farmers receive annually $500,000 due to herd improvement during this period.

The work with dairy sires continues and the eighth list will be published early next spring.

CREAM-GRADERS' LICENCE EXAMINATION COURSE.

No licence examination course was held during 1938 owing to scarcity of applicants. The course for 1939 will be held in Vancouver, commencing March 6th.

LICENCES ISSUED.

During the year, twenty applicants for testers' licences were examined. Seventy-six testers' licences were issued and forty-one licences to cream-graders. To fifty-five persons, firms, companies, or associations creamery or dairy licences were issued.

VERIFICATION TESTS.

No verification tests were requested during 1938.

MEETINGS.

Meetings were attended at the following places: Vancouver (4), Agassiz, Chilliwack (2), East Delta (2), Matsqui, Creston, Vernon (2), Kelowna (2), and Salmon Arm.

DEMONSTRATIONS.

One demonstration in farm cheese-making was held at the farm of J. Turner, Cadboro Bay. Twenty-four persons attended.

PUBLICATIONS.

Dairy Circulars No. 35, "The Seventh List of Dairy Sires," and No. 34, "Annual List of Milk and Butter-fat Records," are the publications for the year. The dairy circulars on the care of milk and cream on the farm are being revised.

NEW DISTRICTS.

Surveys were conducted in new districts to ascertain resources in dairy cows and crops, as well as the general readiness for the institution of factories. Creston was investigated by F. C. Wasson, of this Branch, who, in company with C. Twigg, District Horticulturist of Creston, spent from April 20th to 24th, inclusive, in the area, reporting too great a scarcity of dairy animals for immediate action other than the shipping of cream to the nearest creamery available.

The area east of Lone Butte, including Bridge and Roe Lake Districts, with that of Forest Grove, was carefully canvassed by the writer for possibilities for dairy development. Forest Grove appears fairly well served in cream-shipping facilities.

GENERAL.

Regular returns of manufactured dairy products are received and transmitted in co-operation with the Dominion Bureau of Statistics. Eastern market returns for butter and cheese from the Dominion Dairy Branch are regularly made available to those interested. 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.

REPORT OF THE POULTRY BRANCH.

J. R. TERRY, POULTRY COMMISSIONER.

The weather generally during the past winter was milder than usual, but the crucial period of the year for poultry-breeders—spring—lagged very far behind other years. March and April were much too cold for profitable hatching operations.

The hot and dry weather experienced throughout the entire summer and late into the fall caused very rapid development of young stock generally. The result was that early hatched pullets were laying in some instances six weeks to two months earlier than is considered profitable. Annually around October 15th thousands of early-laying pullets get a violent set-back, occasioned by the usual cold winds at this date. The result is laying is almost reduced to zero, and false moults induced in the majority of cases.

Time and again this Branch has pointed out the folly of forcing pullets, by high-protein feeding and limited yard-room, to the point where birds are laying heavily at four months of age. The eggs produced—pee-wees in size—are not profitable, and such precocious laying also checks the body-growth of the pullets. Contrary to belief, the moulting of six-months-old pullets, with consequent rest period from laying, is not beneficial to the birds. Many breeders maintain that the early moult and rest fortifies the pullets to the extent that they make first-class breeders in the spring.

From a financial standpoint, 1938 may be classed as more favourable than the previous year. Demand was good, and with fewer birds raised, coupled with better returns and a pleasing drop in feed costs, returns were undoubtedly higher. It is interesting to note that a few breeders, who market large numbers of chicks and started pullets on the Prairies, have this year traded for grains, principally wheat.

Egg prices for the year averaged higher than at any time for the past ten years. The prices received during that period are as follows:—

	Cents.		Cents.
1928	29	1934	15
1929	30	1935	16
1930	24	1936	21
1931	20	1937	24
1932	15	1938	25
1933	15		

It should be noted that prices quoted are averaged for the three principal sizes—large, medium, and small.

Again this year high-pressure feeding resulted in many immature pullets laying vast numbers of small pee-wee eggs, thus breaking the price seriously just when eggs were becoming scarce. The average consumer will generally buy the smaller and cheaper egg without realizing that in comparison small eggs at 35 cents per dozen are dearer than large eggs at 45 cents. At prices quoted, the smaller eggs are actually two eggs short in weight. In other words, fourteen eggs should be given if 10 cents less per dozen is charged.

BREEDING AND REARING RESULTS.

For the first time in four years very little complaint was heard as to hatching results generally. The mild weather during the late winter in most sections allowed the breeding fowls to be out on range earlier than usual. There appears to be more matured fowls utilized by the hatchery patrons and other breeders than in the immediate past. This is as it should be. This Branch has consistently attacked the exclusive use of pullets for breeding purposes. For very early hatched chicks some pullets' eggs may have to be used, but it is not recommended as a general practice.

There appears to be an expanding market for British Columbia hatching-eggs from the larger hatcheries in the Prairie Provinces. From inquiries received many more eggs are being purchased this year.

Whether the exporting of eggs, instead of chicks later, will make any difference to the total value of poultry products exported remains to be seen. Suffice it to note that our Provincial hatching-eggs are being sought after more eagerly each year.

Many of the hatcheries enlarged their incubating capacity and reported larger volume of sales during the year. There appears to be signs that the market is at times saturated with day-old cockerels, but it is the writer's opinion that in a very few years the proper and profitable management of this class of chicks for eventual table-poultry purposes will be better understood, and thus take care of the relatively large number of surplus male chicks.

A large demand can be easily worked off by producers specially feeding and marketing the majority of cockerels as broilers at eight to ten weeks. When properly prepared for frying, a quick and satisfactory market will be available. The present wasteful method of selling day-old cockerels at public auction is to be deprecated. Many would-be consumers baulk at having to feed chickens for two months before killing.

A circular dealing with the fattening of day-old chicks is being prepared by the Branch.

As usual, chick-sexing was practised by the hatcheries, who in most cases used Occidental labour for the work. With experience most of those engaged in the work are getting to the point where their skill almost equals the best of the Oriental experts.

POULTRY-DISEASES.

As usual, members of the Branch have examined or investigated numerous outbreaks of disease amongst all classes of fowls, but principally chickens and turkeys. Most of the outbreaks were recorded from the Fraser Valley, and evidence is not wanting that in many cases beginners and farmers have bought up, unknowingly, diseased stock from hucksters and dealers. In many cases the birds have been kept in a diseased condition for weeks before calling on the Branch officials for assistance. In many cases the only advice that could be offered was to destroy and burn the whole flock. It is to be regretted also that after advice is given for treatment in many cases the owners neglect to take any trouble to carry out instructions.

The principal diseases and numbers of same investigated are as follows:—

T.B.	20	Pullorum	6
Paralysis	63	Diphtheretic roup	18
Coccidiosis	38	Premature moulting	20
Ovarian-trouble	5	Infectious bronchitis	2

Turkeys, 6; ducks, 9; rabbits, 37.

With regard to turkey and rabbit investigations, the turkeys were all "blackhead" infestations, and the rabbits were nearly all cases of cannibalism—eating young—brought on by interference of children.

It will be noted that in the above table paralysis, in its various forms, was by far the most frequently investigated. A few years back the principal offender was Pullorum trouble, but evidently due to blood-testing this disease has been less frequent of late.

It is still very difficult to get breeders to market their infected flocks where paralysis is prevalent. They willingly dispose of all affected male birds, but are loath to clear out females. Breeders seem to want some form of drugs recommended, so that they may attempt to cure birds affected. There is no known remedy, and those breeders who are endeavouring to breed from paralytic fowls are taking awful chances.

Some bad cases of coccidiosis were also inspected during the year. In the majority of cases the affected birds were less than one year old. It is very noticeable that in almost every outbreak attended the fowls were ranging over ground that had not been rested for years, and also allowed to scratch in hen-manure piles.

The Branch wishes to acknowledge the co-operation of Dr. E. M. Bruce, V.S., at the Dominion Experimental Laboratory at Saanichton, who has during the year post-mortemed many carcases delivered or advised sent there by this Branch.

DRESSED-POULTRY TRADE.

From increased inquiries there appears to be quite an increase in the number of table-poultry producers, many being situated close to seaside resorts or large cities.

By judicious advertising more carcases are being graded for market, especially turkeys. This work is in the hands of the Dominion Department, and is at present voluntary inspection only.

The usual breeds are utilized for the choice table trade and in addition several large varieties are being used. The Jersey Giants, both black and white, are used either pure or crossed with some other general-purpose breed.

Cross-breeding for laying pullets is also providing a large number of surplus cockerels for the table. The favourite crosses are Red-Wyandottes, Red-Rocks, Red-New Hampshires, and Leghorn-Reds. These breeds are in addition to the stand-bys—Sussex, Rock, Orpington, and Game crosses. The Sussex hen and Game male cross is the premier mating for tip-top table poultry.

BLOOD-TESTING.

The fourth year's work got off to an early start this year, and with a normal season's weather the work was expeditiously carried out by Mr. G. L. Landon, assisted by Mr. John Smith. With the exception of 2 or 3 per cent. of tested fowls on Vancouver Island and the Interior, the Fraser Valley flocks comprised the rest. A statement regarding flock-approval has been prepared by Mr. Landon, and follows this report.

The testing was again handled by the Laboratory at the University of British Columbia at Point Grey, under the direction of Dr. Jervis. The culling, banding, assembling material, and inspection was again carried by the Department. Over 90,000 birds were tested, with the White Leghorns far in the majority. Reds, Rocks, New Hampshires, and Light Sussex were the runners-up.

The Inspectors during testing again found quite a number of birds suffering from colds and incipient roup. The work of the Inspectors in culling and inspecting again met with the approval of flock-owners generally. It was found that where the flocks have been repeatedly culled, the improvement taking place each year justifies the assertion of one of the oldest breeders in the Province that "generally an outsider makes better culling than the birds' owners." A Directory of Breeders was again published.

BOYS' AND GIRLS' POULTRY CLUBS.

With a grand total of fifty-one clubs, eleven more than last year, a banner year was achieved. More and more of the clubs are purchasing day-old chicks instead of hatching-eggs, the totals this year being:—

Chick Clubs	34	Number of chicks	5,845
Hatching-eggs Clubs	17	Number of eggs	2,106

The Barred Rock chicks were favourites, followed closely by Rhode Island Reds, White Leghorns, and New Hampshires.

In the hatching-eggs section, the choice was between Barred Rocks (seven clubs), White Leghorns (five clubs), Rhode Island Reds (four clubs), and Light Sussex (one club).

The clubs were formed by District Agriculturists, Farmers' and Women's Institutes, Poultry Associations, school teachers, and others. Many of the club members exhibited at fall fairs and poultry shows. The Vancouver and Victoria Exhibitions again sponsored junior judging competitions, assisted by the Dominion and Provincial Departments of Agriculture. At both fairs the contestants were out in larger force than ever before. Some very high scores were made at both fairs by the winners.

WATER-FOWL.

The ducks and geese population barely held their own during the past year. Amongst the ducks, White Pekins, Khaki-Campbell, Indian Runner, and Muscovy were the more popular. With the medium-weight ducks, Khakis and Indian Runners, producing per bird numbers of eggs equalling yields of the best Leghorns, it is surprising more of these fowls are not kept. It should be remembered, however, that without good range on grass land it is expensive to feed ducks. With streams and range as mentioned they should be profitable as egg-layers alone.

With geese, practically ninety-eight per cent. of flocks owned are of Toulouse blood. This breed, next to the Chinese geese, are the best layers of the large water-fowl. They are excellent for crossing purposes, either with African, Chinese, or the White Embden.

TURKEYS.

With a heavy drop in production in the Prairie Provinces last year Provincial-grown turkeys here were in better demand and fetched slightly higher prices per pound. A majority of the dealers exhibited Dominion-graded turkeys, and these in many cases fetched premium prices.

Bronze, White, and Red Bourbons were again the favourite breeds.

RABBITS.

The Branch, co-operating with the Vancouver Rabbit-breeders' Association, again published a breeders' directory, which was eagerly sought after. The majority of rabbit-breeders now stock Angora wool rabbits solely. A slight increase is to be reported and shippers generally appear to be satisfied with market prices. A big demand has been experienced from the United States and Great Britain sources. The price has risen slightly and just now $3 per pound is being paid for 2-inch commercial Angora wool by the mills.

OFFICE AND FIELD WORK.

Towards the fall of the past year there was a sudden influx of inquiries from settlers and others desirous of taking up poultry-work. This situation was prophesied by many breeders, and generally it does occur when feed costs drop and a demand sets in for poultry products in consequence.

Many of those inquiring desire to try out the battery-laying cage system. This is a very radical change from the old-established methods, and as pointed out, needs operators to be of much more experience than that evidenced by inquirers.

In connection with the Provincial Association, which is now comprised of the following local associations—Ladysmith, Victoria, Vancouver, Mission, Kamloops, Penticton, Revelstoke, Vernon, and Fernie, and Provincial unattached members—a comprehensive breeders' directory and list of Provincial show winners was published.

Several poultry bulletins were revised and published during the year.

POULTRY FLOCK APPROVAL.

Mr. G. L. Landon, Flock Approval Inspector, has submitted the following report on poultry approval work for the year 1938, this being the fourth year of approval by the Department. A total of 92,178 birds were blood-tested as compared with 93,008 in 1937. The following tables show the statistical data on four years' testing:—

Year.	No. of Flocks approved.	No. of Birds tested.	No. of Bands used.
1935	117	42,074	30,926
1936	127	77,493	63,616
1937	143	93,008	72,330
1938	149	92,178	63,327
Average for 4 years	134	76,188	57,549

SUMMARY OF FOUR YEARS' TESTING.

Year.	No. of Birds tested.	No. of Reactors.	Percentage of Reactors.
1935	42,074	2,563	6.09
1936	77,493	1,879	2.42
1937	93,008	3,224	3.47
1938	92,178	1,842	2.0
Average for 4 years	76,188	2,377	3.1%

BREED STATISTICS, 1938.

Breed.	No. of Birds tested.	No. of Reactors.	Percentage of Reactors.
White Leghorns	68,112	1,199	1.76
R.I. Reds	7,752	257	3.44
B.P. Rocks	6,573	106	1.61
Light Sussex	1,326	89	6.71
New Hampshires	5,072	144	2.83
Miscellaneous breeds	2,051	47	2.29
Retests	1,292	------	----

A total of 304,753 birds have been blood-tested during the four years, with an average percentage of reactors of 3.1 per cent. The year 1938 shows the lowest percentage of reactors, with a marked improvement over 1937. In addition to a steady improvement in the percentage of reactors, there has been a marked improvement in feeding and management of the breeding flocks entered for approval. Systematic culling is having its effect.

Many of the flocks are now headed by R.O.P. approved cockerels, and there is a greater tendency to use these males each year.

There has been a marked change in the attitude of poultry-breeders and hatcherymen towards the blood-testing and approval. Four years ago criticism and opposition were quite pronounced, while at the present time this has almost disappeared.

Weather conditions were very good during the four months of testing this year, the best of any year yet, owing to almost complete absence of fog.

Excellent co-operation was received from Mr. John A. Smith in carrying on the blood-testing of the flocks. Mr. Smith has now had three years' experience in this work and is giving efficient service.

I would also like to mention the co-operation received from Dr. J. G. Jervis and his laboratory staff at the University. It is due to such co-operation that the testing is completed so rapidly each year, thus keeping the cost down to the flock-owners. Nowhere else in North America is this service to the poultrymen given as cheaply as in British Columbia.

The co-operation received from the hatcheries has also been an important factor in carrying on the blood-testing in the Fraser Valley. By providing efficient crews, they have enabled us to speed up the work very considerably.

Since the completion of the blood-testing, every flock has been inspected one or more times, and all leg-bands from reactors collected. In addition, the flock-owners have been given instruction on various phases of production where necessary. Where conditions were not sanitary, instructions were given to clean up.

REPORT OF FIELD CROPS BRANCH.

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

Following one of the driest seasons experienced for years the harvesting of all field crops took place under exceptionally good conditions and at a much earlier date than usual.

Due to a fair supply of moisture in the spring, hay and fall-sown crops did not suffer to the same extent from the dry season as did spring-sown crops. Nevertheless, the yield of hay was generally lower, and in some cases was reported reduced from 25 to 50 per cent. of normal. The quality of the crop, however, averaged up well, having been cut and stacked under favourable conditions.

Grain-crops were generally much below average in yield but the quality was good. The benefits to be derived from sowing grain and other crops in the fall, providing there is good drainage, was most marked on Vancouver Island. As a good illustration of this, one can best refer to the case of a farmer in the Sidney District, on Vancouver Island, who sowed 10 acres to Trebi barley in the fall of 1937 and harvested 835 bushels in 1938—an average yield of 83½ bushels per acre. The same barley, had it been sown in the spring, which is the common practice, would probably have not yielded more than 25 bushels per acre.

Many spring-sown grain-crops were cut green for feed on account of poor growth and lack of pasture.

Potatoes and other root-crops yielded below normal.

Field-crop seeds, generally speaking, gave below average yields and prices also were below those of 1937.

B.C. FIELD CROP UNION.

Interest in this Association has been maintained during the year, the total membership being 315 members.

The annual meeting took place during the Winter Fair at Hastings Park, Vancouver, on November 22nd. Your Commissioner, who is secretary-treasurer, presented his usual annual reports covering secretarial duties and finances. These will all appear in the printed annual report of the Association.

This year's annual meeting was privileged, through the kindness of the Minister of Agriculture, in having in attendance almost all of the directors representing the various districts of the Province. Most of the directors are members of the Advisory Board of Farmers' Institutes.

The speakers at the annual meeting of the Crop Union at this year's meeting were Mr. H. A. Schoth, Agronomist of the United States Department of Agriculture at Corvallis, Oregon, and Dr. S. E. Clarke, Agrostologist of the Dominion Experimental Farm, Swift Current, Saskatchewan. The former spoke on " Progress in the Production of Forage Crops," and the latter on " Hybrid Field Corn."

CHICAGO INTERNATIONAL AND TORONTO ROYAL FAIRS.

A number of exhibitors from this Province again availed themselves of the opportunity of exhibiting at both Toronto Royal and Chicago International. It is gratifying to be able to report that our exhibitors once more brought credit both to themselves and to this Province, in spite of the dry season.

The Department as in former years took care of the transportation charges. This service is much appreciated by the exhibitors, as many of them would be unable to participate in these exhibitions without this assistance.

The complete lists of British Columbia winnings at both of these exhibitions, which are attached, reveal the following information:—

Chicago International.—Twelve prizes won, including two first prizes and reserve champion for field peas.

Toronto Royal.—Seventeen prizes won, including four first prizes, championship for field peas, and reserve champion for barley.

PROVINCIAL SEED FAIR.

The annual Provincial Seed Fair was held in conjunction with the Winter Fair at Hastings Park, Vancouver, November 21st to 23rd, 1938. The entries, which numbered considerably over 400, were much larger than for several years. This was probably due to the increased number of classes, particularly for registered or certified vegetable-seeds.

A meeting of seed-growers took place during the Fair and general interest in the Fair itself was most gratifying to all concerned.

The Winter Fair is becoming more appreciated each year as a centre where farmers can get together and discuss their problems at a time when farm-work is slack.

DISTRICT SEED FAIR.

District seed fairs were held at Dawson Creek, Armstrong, and Vanderhoof. Your Commissioner participated in the judging at Dawson Creek and Armstrong. These district seed fairs serve as useful feeders to the Provincial Seed Fair. All of these fairs were well patronized both in number of exhibits and in attendance.

SEED-DRILL SURVEY.

Seed-drill surveys conducted under the joint auspices of the Provincial and Federal Departments of Agriculture were conducted in the Interior and in the Peace River Block.

The samples in the Peace River Block were secured by T. S. Crack, District Agriculturist, whilst those in the Interior were secured by officials of the Horticultural Staff at Vernon.

The results of these surveys clearly indicate that a large number of farmers continue to sow seed which is badly infested with weed-seeds.

On file in the Department is a report of all seed-drill samples taken at seed-time and examined for weed-seeds. There were eighty samples taken, including forty-nine wheat, twenty-nine oats, and five barley. Only sixteen samples of wheat, eight of oats, and one of barley qualified for No. 1 grade. The report shows that the most prevalent noxious weed-seeds were ball mustard, stinkweed, hare's ear mustard, and wild oats. Most prevalent non-noxious weed-seeds were lamb's-quarters, yarrow, wild buckwheat, and false wild oats.

SEED-CLEANING MACHINERY.

Several hand-cleaners and power-machines were purchased during the year under the joint Provincial and Federal policy. The power-machine was installed at McBride, whilst the hand-machines were for use in the Peace River Block.

These cleaners are proving of real value in the districts in which they are installed and apparently are being used to the fullest advantage. In addition to this, they serve as a useful medium for keeping Farmers' Institutes and other agricultural associations intact.

CROP COMPETITIONS.

Two standing field-crop competitions for green oats were again held in the Peace River Block; the one at Groundbirch and the other at Progress. A corn competition was also conducted in the Armstrong District.

HYBRID FIELD-CORN TESTS.

Following up the work started in 1937 through the co-operation of Dr. S. E. Clarke, Agrostologist of the Dominion Experimental Farm, Swift Current, tests with hybrid field-corns and some of the standard varieties were continued in the Interior, and several field-days arranged by Mr. M. S. Middleton, District Horticulturist at Vernon, and his staff were held. Dr. S. E. Clarke was the chief speaker. Your Commissioner was also present and spoke briefly.

Although the attendance at the field-days was not large, nevertheless it was quite evident that those who did turn out were very much interested in learning of ways and means of improving their corn-crops. Considerable dissatisfaction has been expressed by farmers in past years in the quality of the seed they have been receiving.

The field-days referred to above were held at Vicar Bros.' Ranch, Kamloops; Ross Lockhart's farm, Armstrong; Coldstream Ranch, Vernon; and Simpson Ranch, Kelowna.

Appended to this report is a table showing the complete results obtained from the various tests.

Of the hybrid field-corns tested A-2 was generally found to be the most suitable. On the other hand, of the standard varieties Golden Glow was generally superior to the others.

SPURWAY SOIL-TESTS.

During the year 137 tests of soil samples were made for farmers and gardeners by S. S. Phillips, Assistant Field Crops Commissioner. Letters recommending fertilizers and cultural practices were written by Mr. Paul C. Black, based on these tests.

Farmers are showing much interest in their soil-fertility problems, and the number of samples being sent in for analysis are steadily increasing.

A statement of all soil samples tested by the Spurway method is on file in the office, and covers soils received for analyses from approximately 100 farms.

The soil-tests reveal that lime is needed in the majority of cases to neutralize soil-acidity. They also show a deficiency of phosphoric acid. An adequate supply of humus was also lacking in a great many samples.

THRESHING RETURNS.

Through the co-operation of the District Agriculturists and officials of the Horticultural Branch, this office keeps a record of the amount of grain and seed threshed.

The reports showing the amount of grain and seed threshed in the various areas for 1938 will not be completed until early in 1939. For this reason the returns for 1937 are attached.

PERMANENT PASTURE.

Realizing the need for improving our pastures and also the importance of permanent pastures on many farms, pasture plots have been established on several farms. The mixtures used vary according to soil and climatic conditions. In this connection fertilizers are also being applied and their value noted in building up pastures, particularly the wild white clover.

FIELD-CROP SEED PRODUCTION.

In co-operation with the Plant Products Division of the Federal Department of Agriculture, this Branch directs seed-promotion activities as far as field-crop seeds are concerned. Figures showing the production of seed for 1938 are not yet available.

The following statement shows the kinds and quantities of seed produced in 1937:—

Kind.	Quantity, Lb.
Mangel	6,120
Corn (field)	8,700
Timothy	1,000,000
Red clover	200,000
Alfalfa	65,000
Alsike clover	200,000
Timothy and alsike (mixture)	100,000
Crested wheat grass	1,000

In comparing the value of the seeds produced in this Province in the years 1927 and 1937, a period of ten years, it is interesting to note that the total value of seeds in 1927 was $72,652.50 and in 1937 it was $245,491.22. In other words, the total value of all seeds grown in British Columbia in 1937 was 400 per cent. greater than in 1927.

This office is continually looking into the possibilities of extending our seed-growing operations in this Province, and much encouragement has been given to suitable growers, with the co-operation of the Dominion Seed Inspectors. It should be pointed out, however, that the whole situation must be carefully surveyed before much encouragement is given to any individual.

The main points to consider are: (1.) What kind of a seed-grower will the individual make. It must be remembered that care at all times must be exercised in the production of seed. (2.) The type of land. (3.) The kind of seed. It is of no use encouraging a man to grow a kind of seed for which there is little demand or than can be produced more cheaply in other places. (4.) Is suitable stock seed available. (5.) Is harvesting, threshing, and cleaning machinery available which is suitable for the particular kind of seed under consideration.

During the past year through a joint Provincial and Federal seed policy considerable quantities of alsike, red clover, and alfalfa were made available to farmers in Central British Columbia and the Peace River District, on the basis the farmers pay half the cost of the seed or return an equal quantity of the same grade of seed within two years. It is interesting to note that most of the farmers preferred to give the cash rather than take the seed on a time basis. The highest grade of seed of the best strains and varieties was distributed. At the present time the market prospects for seeds of red clover, alsike, and alfalfa are favourable.

Encouragement has also been given to the production of certain grass-seeds such as Crested Wheat Grass and Creeping Red Fescue. At the present time considerable quantities of these seeds are imported. It is hoped that this Province will not only be able to supply its own needs within a few years but will have seed for export.

With respect to alfalfa-seed production, Mr. M. S. Middleton, District Horticulturist, Vernon, writes as follows:—" The Ladak alfalfa-seed at Okanagan Landing is progressing favourably and this year Mr. Frank Choveaux, on whose farm the work was started four years ago, has been designated an Elite alfalfa-seed grower for this variety. He has now over 100 acres seeded to Ladak for seed production. So far results would indicate that this

variety is superior in hardiness, drought-resistance, yield, and in fineness of stem and quality."

Increased interest is being shown in Meadow Foxtail grass in the Williams Lake District. For this reason your Commissioner obtained some seed of this grass from Europe for use in that area. It is hoped that in the not too far distant future a local source of this seed will be available.

It should also be stated that 100-lb. lots of the Aberystwyth strains of orchard grass and perennial rye grass-seeds have been imported from England. These are pasture strains which should be worth propagating in this Province.

During the year your Commissioner attended the annual meeting of the Lytton Alfalfa Seed-growers' Association. A splendid alfalfa-seed business has been built up in this district due in part to the encouragement and assistance given by this Department.

With the object of securing more information regarding certain varieties of swede turnips being offered on the market and also to ascertain their suitability for seed-production purposes, samples of seed were obtained from various seed-houses in Canada and sent to the Dominion Experimental Farm, Agassiz, for testing. Owing to the very dry season rather disappointing results were obtained, but the work will be continued next year.

Valuable service has been rendered to the seed and grain industry in this Province by the Dominion Plant Products Laboratory which was opened in Vancouver last year.

WEEDS.

The weed problem has received the usual attention from this Branch as it is realized that this is an important matter. To obtain the best results the co-operation of all those operating land in the Province is essential and this Branch is directing its energies along this line. In going through the Province, it is obvious that greater interest is being shown in this problem and the public generally is becoming more weed-conscious.

The importance of the weed problem in the Peace River Block is recognized and the Department again supplemented the weed-inspection work undertaken by the Provincial Police in that area by reappointing S. E. Cushway, of Baldonnel, as Weed Inspector for the north side of the Peace River, and C. Mixer, of Kilkerran, was appointed Weed Inspector for the south side of the river.

A fairly active educational campaign has also been carried on. The illustrated weed bulletin and posters are being revised, and several instructive and timely stencilled circulars have been prepared by Mr. Paul C. Black and distributed to Farmers' Institutes.

Weed specimens have been collected whenever time has permitted and the same forwarded to Mr. J. W. Eastham, Provincial Botanist, for identification and mounting.

The use of chemicals for weed-control has been further investigated. The chemicals in question are activated carbon bisulphide, sodium chlorate, and calcium cyanamide.

H. H. Evans, District Field Inspector at Vernon, states that the results obtained from applications of sodium chlorate made by farmers in the fall of 1937 for the control of perennial weeds has been variable. In the case of morning-glory (*Convolvulus arvensis*) and creeping or Canada thistle (*Cirsium arvense*) he states "that quite good control was obtained, but in the case of couch-grass (*Agropyron repens*) control was quite variable, and on hoary pepper-grass (*Lepidium draba*) the results were poor."

Activated carbon bisulphide was tested out on a small area in the Armstrong District for the control of hoary pepper-grass. Poor results were obtained, but the matter is receiving further attention.

On Vancouver Island calcium cyanamide in the powdered form was used by a few farmers for the control of wild mustard. Here again the results were not satisfactory, due to several reasons. However, further tests will be carried on in 1939.

E. C. Hunt, District Horticulturist at Nelson, states "that some test-plots for the control of couch-grass were made in the fall of 1937 with sodium chlorate. One plot was located at Harrop and the other in the Willow Point section. Two methods of application were made, namely: (1) By spraying at the rate of 2 lb. of sodium chlorate to 1 gallon of water; (2) by mixing the chemical with sand or dry soil, broadcasting both ways and applying at the rate of 180 lb. per acre.

Mr. Hunt further states "that where the couch-grass was sprayed with the sodium chlorate a very satisfactory kill was noticed last spring and a very marked difference was observed between the treated and untreated section. On the other hand, very little, if any, kill was noticed where the sodium chlorate was applied with the sand or soil and broadcasted."

GRAIN SCREENINGS.

Mr. Walter Sandall, District Field Inspector at Vancouver, reports that: "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 prescribed regulations."

In compliance with the Provincial "Noxious Weeds Act" and amendments thereto, 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 screenings, shall not be removed from any elevator, mill, or warehouse to any place within the Province, except by special permit issued at the office of the District Field Inspector, Court-house, Vancouver, B.C.

Permits consist of two specific forms—i.e., one permitting removal of grain screenings by feed merchants or dealers, and one a feeder's permit which entitles the holder to remove screenings and conditional to prescribed regulations. Permits are issued only to applicants whose premises are so situated that the use of screenings will not, in the opinion of the Inspector, develop a weed-menace. Such premises are subject to inspection from time to time.

During the year screenings permits were issued for various quantities from 1 ton to 200 car-loads. These permits are valid during the year of issue and expire on December 31st of that year, providing the quantity covered by such permit is not sooner exhausted. A permit entitles the holder to remove uncleaned and refuse screenings from only the grain-elevator or dealer stated on the permit.

A car-load of grain screenings equals approximately 30 tons.

During the year 1938, eighteen permits to remove screenings have been issued, providing for the removal of 686 car-loads—approximately 20,580 tons, of which only 6,250 tons 760 lb. was actually removed.

Twenty-one feeder's permits have also been issued, covering the purchase by the holders of screenings amounting to a total of 403 tons 200 lb., of which only 100 tons 962 lb. was removed.

MANAGERS' REPORTS.

Complying with regulations governing the movement of grain screenings, monthly reports were received at the office of the District Field Inspector, Court-house, Vancouver, B.C., from managers of all grain-elevators and the principal dealers within the Province. Each report contained name and address of consignee, date of delivery, quantity, grade, number of permit (if any), and whether for home use or export. The forms are supplied by the Provincial Government.

The table in Appendix No. 7 will show the quantity of screenings removed from British Columbia grain-elevators each month during 1938, as compiled from the managers' reports. It will be seen that from September to the end of the year, screenings deliveries in Vancouver showed a considerable increase over the same period a year ago, due to the heavy flow of new crop grain from the Province of Alberta.

B.C. WINNINGS AT TORONTO ROYAL, 1938.

Red Clover.—8, A. D. Paterson, Ladner.

Wheat, Hard Red Spring.—5, Mrs. C. Kelsey, Erickson; 9, G. H. Hiffernan, Rolla; 13, W. L. Clegg & Sons, Chilliwack.

Wheat, Durum.—3, Wm. Rogers, Tappen.

Wheat, Soft Winter.—5, Wm. Rogers, Tappen.

Barley, Six-rowed (Region 1).—1, Miss Hilda W. Pearkes, Sidney.

Peas, Field.—1, Douglas Gibson, Ladner; 3, B. Young, Koksilah.

SEED FROM A REGISTERED OR CERTIFIED CROP.

Barley, Six-rowed (Region 1).—4, B. Young, Koksilah.
Oats, White, Other than Early (Region 1).—7, B. Young, Koksilah.
Wheat, Winter.—2, B. Young, Koksilah.
Potatoes (Green Mountain).—1, Ross Bros., Pemberton; 3, S. J. Gray, Milner.
Potatoes (Irish Cobbler).—1, J. Decker, Pemberton.
Potatoes (Any Other Variety).—2, Ross Bros., Pemberton; 3, J. Decker, Pemberton.
Championship (Peas).—Douglas Gibson, Ladner.
Reserve Championship (Barley).—Miss Hilda W. Pearkes, Sidney.

B.C. WINNINGS, INTERNATIONAL HAY AND GRAIN SHOW, CHICAGO, 1938.

Field Peas (Large Yellow).—1, Doug. Gibson, Ladner; 3, C. W. Stirling, Sidney.
Field Peas (Small Yellow).—2, C. W. Stirling, Sidney.
Field Peas (Any Other Varieties).—1, C. W. Stirling, Sidney.
Reserve Champion Sample of Field Peas (Large Yellow).—Doug. Gibson, Ladner.
Soft Red Winter Wheat.—3, Wm. Rogers, Tappen.
Hard Red Spring Wheat—7, Mrs. A. Kelsey, Erickson; 12, Geo. H. Hiffernan, Rolla; 19, W. S. Simpson, Sweetwater.
White Winter Wheat.—2, Wm. Rogers, Tappen.
Alfalfa-West.—3, J. W. Abbott, Baldonnel.
Red Clover.—4, A. D. Paterson, Ladner.

WOMEN'S INSTITUTE BRANCH.

MRS. V. S. MCLACHLAN, SUPERINTENDENT.

The outstanding Women's Institute event of the year was the Provincial conference held in Vancouver in July. By means of a grant made by the Department and a similar sum raised by the institutes, the Provincial Board was able to pay the transportation expenses of the 105 official delegates from all parts of the Province, and over one hundred other institute members attended the sessions and took an active part in the discussions. Miss H. McCain, Superintendent of the Quebec Women's Institutes, was a guest of the Provincial Board for the conference, and valuable addresses were given by the Honourable the Minister of Agriculture; Hon. G. M. Weir, Minister of Education; Dr. H. E. Young, Provincial Officer of Health; Dr. G. M. Shrumm, Director, U.B.C. Extension Department; and the Deputy Minister of Agriculture. The conference closed on the third evening with a banquet at the Vancouver Hotel, attended by about 200 institute members. The official delegates were the guests of the Department.

In addition to the Provincial conference, district conferences were held in the following districts: Peace River, North Vancouver Island, South Vancouver Island, Kootenay and Arrow Lakes (a joint conference), Okanagan, Salmon Arm, and South Fraser. Possibly the wider interest aroused by these conferences accounts for the fact that no institutes have lapsed during the year and thirteen new ones have been organized.

Mrs. H. McGregor, Penticton, Provincial President, is now President also of the Federated Women's Institutes of Canada. In this capacity she expects to visit London in July, 1939, to attend the Triennial Conference of the Associated Countrywomen of the World.

Successful Junior Institutes are reported by the Prince George, South Saanich, Squamish, Progress, Saltair, and Penticton Institutes. Boy Scouts and Girl Guides are supported actively by eleven institutes, seven of which actually sponsor the companies. The Scouts at Somenos and the Scouts and Guides at Sooke were organized by the local Women's Institutes.

Institutes are co-operating actively in the organization of Youth Training Centres, the first of which was held at Hazelmere under the auspices of the Women's Institute, with a registration of sixty pupils. Other centres are reported at Telkwa, Southbank, and Woodpecker. At Hazelmere and Cedar young people's clubs have been organized to carry on the work learned at the Centre.

Boys' and girls' poultry clubs are reported by Shirley, Sooke, Midway, Coleman Creek, Cedar, and Rock Creek. Shearerdale and Coleman Creek have calf and pig clubs for their young folk; St. Elmo and Rock Creek have potato clubs. Numerous institutes also sponsor garden clubs, manual training classes for boys, and sewing and cookery classes for girls, and every institute fair or flower show has its classes for children in sewing, cookery, handicrafts, and school-work.

HANDICRAFTS.

Weaving is now established as a definite craft in eighteen centres, of which the most notable are Pender and Mayne Islands, Victoria, Lone Butte, and Slocan Valley, and three institutes own looms for the benefit of members.

In the Peace River, Arras, Cecil Lake, and Pouce Coupe are experimenting with dyes made from local plants and obtaining some very charming colours, but it remains to be seen how durable these will prove.

Perhaps the most valuable result of the revival of weaving and spinning is the contact such work forms with new Canadians, many of whom used to spin and weave in their home-lands, and now find themselves occupying proud positions as teachers in their communities. Excellent results in this connection are being obtained in the Peace River and among the Mennonites at Merville.

At Pouce Coupe Mrs. Spencer Tuck organized a handicraft exhibition in connection with the fall fair, which was an outstanding success. The handicrafts of all the block were demonstrated, including those of Norway, Ukraine, and Czechoslovakia, which were demonstrated by institute members wearing the national dress of their home-lands. At this exhibit progress also was entirely original and showed a straw hat plaited from oat-straw.

Seven institutes report practical results in glove-making. At Prince George buckskin is obtained from the Indians and made into gloves and mitts. Four institutes report skilled basket-makers, and practically every institute has some members who make hooked rugs and wool-filled comforters.

The Craft Centre organized at Hope is becoming known. Despite road-making which hindered traffic in 1937, and the forest fires of 1938, sales have steadily increased. One of the great difficulties in connection with sales is the poor quality of work usually coming from women in isolated districts, to whom the centre might be the greatest boon. To overcome this the Branch has purchased a small sample exhibit which particularly stresses artistic design and colouring. This is now touring the Peace River Institutes, while a growing list of applications awaits its return to Victoria. The Peace River Institutes have promised to add one of their best samples of work to the exhibit when they return it. The Youth Training Centres should also help to raise the standard of work.

The Department sent an exhibit of leather-work, weaving, and pottery to the Royal Winter Fair at Toronto, which aroused universal approval. The Provincial Board sent a small exhibit of weaving and rug-making to the Glasgow Exhibition, and an exhibit of basketry, crystallized fruit, and pottery to the Triennial Conference of the Associated Country-women of the World in London for next July.

HEALTH-WORK.

In the Kootenay District the eye treatment for children, started with an anonymous donation of $1,000, has proved so satisfactory that the donor has given another $1,000 to continue the work.

OTHOA SCOTT FUND.

The child for whom treatment was provided in 1937 has been discharged, and the Provincial Board is now arranging to provide treatment for a second crippled child. Meanwhile donations to the fund continue to come in fairly steadily.

DENTAL CLINICS.

Pender Island, Quick, Fraser Lake, and the Peace River, where clinics have been held for the last two or three years, all report little work required on the children's teeth in 1938. Seventeen institutes held or attended clinics during the year. At Robson the $80 raised by the parents towards the expense of the clinic was stolen from the local store. However, the institute valiantly set to work and replaced the money, finally holding a clinic costing $160.

New institutes have been organized at Koksilah, South Vancouver Island District; Hornby Island, North Vancouver Island District; Lull Bay, North Fraser District; Port Kells, South Fraser District; Osoyoos, and a new one at Penticton, Okanagan District; Birch Island, Forest Grove, and Pavilion, Salmon Arm District; Greenwood and Fauquier, Kootenay District; Parkland, Peace River District; and Forestdale, in the Cariboo.

Total number of institutes	174
Total membership	4,275
New institutes organized	13
Institutes disbanded	*Nil*
Total receipts by institutes	$46,455.63
Total expenditures	$40,637.18

A monthly bulletin of items of interest to Women's Institutes is sent out each month and receives continued approval.

Twenty-two institutes participated in fall fairs, or held flower shows, and fifteen applied for and received the five book prizes given by the Department.

ANNUAL REPORT ON SOIL-SURVEYS.

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

Field operations during the summer of 1938 included the beginning of a soil-survey of the Central Interior, soil classification of the Lumby Valley and tributary valleys to the east of Vernon, an investigation of soil and native plant relationships on the Kamloops Range Experiment Station, and a survey of the bottom of Duck Lake on the Kootenay River Flats. New mapping-work in 1938 involved the classification of about 184,000 acres.

CENTRAL INTERIOR SURVEY.

A reconnaissance soil-survey in the Central Interior was carried on for three months. The area classified, which lies in the Prince George District between Shelly and Woodpecker, amounts to approximately 136,000 acres.

Elevation at Prince George is 1,862 feet above sea-level, but the greater part of the map area lies somewhat higher on a gently undulating plateau, with average elevation about 2,250 feet. The temperature range is from a maximum of 90 degrees F. in summer to 41 degrees below zero in winter. Mean annual temperature is 39 degrees, and annual precipitation is 19.33 inches. The summer weather is characterized by long, warm days and cool nights. Rainfall is highest in June, with a total of 6.83 inches during May, June, July, and August. The pattern of precipitation is remarkably even during the crop-growing months. The cool night temperatures are instrumental in permitting the greatest moisture economy by plants. Less rainfall for crop production is required here than in more southerly districts.

The climax type of native vegetation is white spruce. When the climax forest is destroyed by fire, the burn is soon covered by a luxuriant sub-climax growth of aspen, willow, birch, weeds, and shrubs. On old burned areas, or where seeding conditions have been favourable after forest fires, there is a stand of lodge-pole pine. The sub-climax deciduous growth is the most easily reclaimed for agriculture.

The fine-textured soils, which cover the greater part of this region, were accumulated during the decay stages of the last glaciation, when the waters of a great lake were impounded in the old valley-depressions behind ice barriers. The shore-line of the lake has been found at about 2,450 feet elevation, above which are large areas of rock and glacial till. Below the old shore-line are the potentially arable soils of the region, which at present are roughly estimated to cover almost a million acres.

The mud from the ice-sheet was discharged into the lake during the summer melting period. The coarser material settled first near the points of maximum discharge, and the finer sediments were carried out to settle more slowly in quiet water. In the most tranquil

part of the lake the fine clay accumulated and settled. Fine sediments of different texture were thus distributed on the lake-bottom. As the ice barriers melted the lake-level was lowered, and the Fraser and Nechaco drainage systems began to trench out their present channels in the lake-bottom. Vast quantities of fine sediments were transported away at this time and discharged into the Fraser Delta. These sediments contributed largely to the area which is now dyked and farmed between Chilliwack and the Coast.

The soils support a forest cover, are podsolic, weakly acid in reaction, and deficient in organic matter. If cleared and properly farmed the heavier textured soils can be made to produce good yields of crops.

The main soil type in the map area is a heavy clay covering about 95,000 acres, of which approximately 3,600 acres are under cultivation and 500 acres represents old and new slashing. Development takes the form of small plots of slash and cultivated ground throughout the clay area. Satisfactory yields of such crops as wheat, oats, clover-seed, timothy, potatoes, roots, and garden-truck demonstrate the utility of this type of soil for farming. The clover and timothy seed, potatoes, and vegetables are of outstanding quality.

The remaining arable soil types in the map area consist of fine materials which form the Recent terraces of the Fraser and the flood-plains of tributary streams. These soils amount to about 13,000 acres, and approximately 500 acres are under cultivation. The total of potentially arable land in the map area is about 108,000 acres. Total development amounts to about 4,600 acres cleared and slashed. There are approximately 115 miles of roads in the area and eight schools, two of which are closed.

LAND-TENURE IN CLASSIFIED AREA.

	Acres.
Land in private ownership—	
Crown-granted	33,516.9
Privately held	42,609.32
Subdivided into 5-acre lots	4,964.4
Pre-emption Record	3,375.0
Total	84,465.62
Land in Government ownership—	
Crown land	27,862.2
Reverted to Crown	16,584.0
Land Settlement Board	3,489.27
Vacant	3,088.0
Application to Purchase	400.0
Total	51,423.47
Total in map area	135,889.09

Arable land in Government ownership amounts to about 29,958 acres, and submarginal Government-owned land 21,465 acres; hence there are nearly 30,000 acres available for new settlement in the map area. Submarginal land in private ownership is about 6,424 acres. The submarginal land tends to revert to the Government at a faster rate than the arable types. In areas that have been soil-surveyed a review of the submarginal land problem is recommended. A remarkably large acreage in the map area is privately held, compared with the acreage actually under cultivation.

Most farms are potentially arable, yet acreage under cultivation is small and development in the past has been slow. Slow progress may not be charged against land values, which average from $5 to $8 per acre. The general lack of progress is probably due to economic factors such as distance from market and the rapidity of communications. The proposed Alaska Highway would bring the present map area within twenty-four hours of Vancouver by truck, and this may provide the stimulant for which the district has been waiting.

OTHER CLASSIFICATION WORK.

In order to meet the requirements of a soil-survey report on the Okanagan region, it was essential to classify the bottoms of side-valleys to the east of the main Okanagan Valley.

This work, covering about 40,000 acres, was completed in November. It included a part of the Shuswap River Valley and several valleys tributary to the Lumby District.

The relationship between soil, native vegetation, and climate is of fundamental importance to soil classification in British Columbia, particularly when related to altitude and latitude. For some years the economic importance of separating several soil and vegetative zones has been recognized, but the order of their occurrence and the main distinguishing features of each zone had not been established.

This problem was attacked during the summer season by Mr. R. H. Spilsbury, Assistant Soil Surveyor, and Mr. E. S. Tisdale, Agrostologist in Charge of the Dominion Range Experiment Station at Kamloops. The objective was to survey and identify the succession of soils, climates, and plant-life which occurs in the semi-arid interior at elevations between 1,100 and 6,000 feet above sea-level. This cross-section could then be applied wherever similar conditions prevail in the Province. The work was done on the Dominion Range Experiment Station. The practical issue involved is the separation of the ranges into several production categories by using the natural-soil zone boundaries. The soil zones on the range are related to the annual growth factor and the carrying capacity for live stock.

In the early part of the field season the bottom of Duck Lake, on Kootenay River Flats, was examined to determine the value of the soil-material for reclamation. The examination of the lake-bottom was undertaken by the use of a boat, which was kept located by triangulation. The work was done with the co-operation of Mr. R. Pollard, Assistant Engineer, Water Rights Branch, Nelson. A preliminary report on the area, which covers about 8,000 acres, was completed on April 27th.

GENERAL.

Work was continued during the winter and part of the summer season on the report and map material of the Lower Fraser Valley Soil-survey. The map was drafted by the Surveyor-General and Chief, Hydrographic Service, Ottawa, and printed in the latter part of 1938. The report manuscript is undergoing final treatment at Ottawa and should be published before spring of 1939.

Soil-survey field-work has been completed in the Lower Fraser and Okanagan Valleys. The report on the Lower Fraser Valley is in the hands of the publisher, and the Okanagan report material is in the first stage of preparation. In addition to the two areas in which field-work has been completed, soil-surveys have been undertaken which cover parts of several other farming districts. These are the Thompson Valley, the East Kootenay region, and the Central Interior. Reports for publication on the latter are not warranted until the work in each area has been completed.

REPORT OF DISTRICT AGRICULTURISTS.

LOWER MAINLAND DISTRICT.

R. G. Sutton, B.S.A., New Westminster.

It is probable the season of 1938 will go down in history as one of the driest ever experienced by this district. In spite of this feature, crops were generally very good.

There was some snow and some heavy rains during the winter, but the weather was generally mild. Spring work started in good time with plenty of moisture. Pasture came on well but practically disappeared during the hot, dry weather of the summer. Haying and harvest came in in good shape and the autumn weather was mild and fine well into October.

There was little, if any, damage from flooding on dyked lands this year, no great amount of frost damage and, due to dry weather, some of the more damaging plant-diseases were at a minimum.

During the early part of the fall the land was a little too dry for good ploughing, but rains have improved this condition. The season draws to a close with conditions near to the average for other years.

Live-stock Conditions.

Last year mention was made of the heavy shipments of dairy cattle from this district to the United States. This year, the movement has continued, but on a much smaller scale.

Dairy cattle have, as a rule, wintered well and come out in good shape in the spring as feed was plentiful. There was a marked decline in milk production during the summer due to dry weather adversely affecting pastures. So marked was this shortage that some men had to draw heavily on the current year's hay-crop to keep up the milk-flow. Thus, in a few cases, winter-feed supplies may not be as ample as last year but no great shortage is anticipated. The price of dairy cows has kept up well during the season.

There was some change in the swine situation, as early in the spring the price of young pigs went away up, in some cases to $6 and $7 for weaners. The reason for this appeared to be an acute shortage of feeder hogs in the Prairie Provinces. There are several large hog-feeding establishments near Vancouver where feeder hogs are purchased and fed garbage to finish them. As these plants could not fill their requirements for feeders on the Prairies, they scoured the local district for odd lots of feeders and, failing to obtain them, had to buy weaners instead.

This condition has continued till this date, but not to the same extreme as last spring. One effect already noticeable is that more sows than usual have been bred for spring farrowing and several men are laying plans for raising feeder hogs to sell to the feeding plants. This appears to be an excellent trend and is being encouraged.

Spring litters came in good shape this year and losses were light. At no time after litters started to come was there any very severe weather.

Lambing started generally in February and the crop was good. With mild weather and early grass, the lambs did well and losses were light. There is no particular change in the general sheep picture.

There is as much, or more, interest shown in raising draught horses as compared with last year. There was a fine crop of colts raised and fully as many, or possibly a few more, mares have been bred. Some car-load lots of horses were brought in from Interior and Prairie points during the spring and there seemed to be no difficulty in disposing of them. Prices ranged much the same as last year.

Stock generally go into the winter in fair to good condition and, while feed-supplies are not as large as last year, yet no great shortage is anticipated.

Field-crop Conditions.

The winter was generally mild so clover-crops wintered well. A few cases of damage to clover from heaving were reported after a frosty period in the spring, but this was not general. As the winter waned it became evident there was a considerable surplus of hay on hand. After some negotiation, this started to move to the Province of Saskatchewan and, all told, some 250 cars were loaded at Valley points. The price received was not high, $9 f.o.b., but the movement had the effect of clearing up a heavy surplus and helped to stabilize the local price.

Seeding started in some localities early in March and some early potatoes were planted before the 15th. Seeding, however, was not general till the first week in April. Showers in some localities interrupted the operation and caused some delay, but by May 15th it was fairly well completed.

The hot, dry weather came about May 15th and continued till October, broken only a few times by local showers. Pasture, of course, suffered greatest damage and created a very real problem on some farms. Milk yields dropped and some had to draw on the current year's hay-crop for feed.

As the dry weather continued, it was thought the grain-crop would suffer. Straw was probably shorter at threshing-time but yields were not greatly reduced. One explanation offered was that the yield was lower this year, but because so little of the grain lodged it was practically all harvested, while other years the yield has been heavier but losses from lodged grain were so much greater. Some areas reported light yields of grain and others reported yields heavier than usual. It could be summed up by saying yields were patchy, with the general yield approximately up to average.

The hay-crop suffered a little from dry weather, but was off before it could be much affected. Yields were approximately up to average but definitely lower than last year, around 2.5 to 3 tons.

Ensilage corn went into the ground a little later than usual but came on well and the fine late fall permitted a good degree of maturity. Yields would stand at an average compared with other years.

Potato-crops seemed to stand up well in spite of dry weather and there was very little late blight in evidence. Some yields of as high as 14 tons have been reported, but the average among growers will be in the neighbourhood of 8 to 9 tons.

Probably the biggest red-clover seed-crop was threshed this year. Each year the clover-seed area has been spreading, and now production is high in some areas where four years ago no clover-seed was grown. Estimates put the total amount threshed at 150 tons, with some farms reporting yields of 500 lb. per acre and some only 100 lb.

Assistance to Settlers' Plan.

This work continues to demand a good deal of time that is not easily spared from regular agricultural work. It has been claimed that this is work which might be left over for slack time, but such cannot be done. For example, a settler under this plan has received authorization from the Relief Office to purchase a cow or horse. After some searching, he finds one to suit him and this office is at once requested to make an inspection of the animal. If the inspection is not made within a day or two the vendor of the animal finds sale elsewhere; the settler is disappointed, and this office is blamed for the delay.

During the year some seventy to eighty calls at farms have been made on this work, thirty head of live stock inspected, and approximately twenty-five new applications investigated. The most cordial relations are maintained with the Relief Office, and every effort is made to avoid delay in dealing with this business.

Land Settlement Board.

At the request of the above Board, several appraisals have been made of farm properties in which they are interested.

Seed-promotion Work.

As reported, the big feature this year has been the heavy production of red-clover seed. Several years ago, production of this seed was limited to the Sumas-Matsqui District. During the depression years, when so many farmers of the district were hard put to purchase the necessary clover-seed for spring seeding, this office advised a number to cut over their pasture-fields in the fall and thresh out what clover-seed was otherwise going to waste. This was done in a number of cases and lots of 20, 50, and 100 lb. of good clover-seed were recovered. Since then the production of red-clover seed in commercial quantities is no more limited to Sumas-Matsqui. Good yields in marketable quantities are now reported from Langley, Ladner, Mission, and Dewdney, as well as from the original district of Sumas. There was a heavy set of seed this year, and with the increased acreage the total production is in excess of 150 lb. This figure is considerably greater than the annual consumption, thus leaving a surplus.

Apart from red-clover, seed of wheat, oats, and barley, and some corn is produced and offered for sale as the market demands. Considerable progress has also been made in the production of vegetable-seed. Considerable time has been spent encouraging growers to exhibit at different fairs, and assistance has been given in preparing exhibits and in the various operations contingent upon seed production. Mention might be made of the local seed and potato show which has been held for four years now in Langley Municipality. This is purely a local effort and a ribbon show, but it serves as a feeder for the Provincial seed show and has also done much to standardize types and varieties, and to encourage seed-growing in the district.

This office has co-operated closely with those in charge of this fair, has assisted in preparing prize-lists, and in setting up and judging exhibits. The fair this year showed a substantial growth over last year and appears to have established itself. It has possibly grown to its maximum as a ribbon show and it appears that if it is to occupy its proper place as a district seed show, some financing of the prize-list will be necessary. It is recommended that it be recognized as such and placed on the same footing as other assisted seed shows.

At the request of the Field Crops Commissioner, a fifteen-minute radio address was given last spring over the Chilliwack radio station. This address emphasized the value of pure

seed and contained some remarks relative to the spread of weeds. The small Clipper seed-cleaner continues to be very useful and is constantly on loan to men who use it to clean up small amounts of seed. It is submitted that much more seed-promotion work might be done if time permitted.

Farmers' Institute and other Meetings.

Some fifteen to twenty winter meetings were attended and addresses given, or some of the departmental films shown. One showing of these films was given at the local high school. A number of field-days were attended and addresses or demonstrations given. Chief among these were the field-days of Jersey, Guernsey, Ayrshire, Swine, and Horse Breeders' Associations. Four ploughing-matches were attended and assisted, also several annual meetings of fall fair associations.

Warble-fly Control.

There has been a marked increase in the interest shown in warble-fly control. Last year control-work was carried on in two areas, and this year in the following six areas: Agassiz, Dewdney, and Pitt Meadows (first year); Atchelitz and Hatzic (second year); and Barnston Island (third year).

The season being open, this work was started in February and two general applications were made in each area. The work was organized in each case through some local organization. The actual treatment was done by volunteer labour on the system of the old-fashioned bee, supervised in each case by your representative.

In the Agassiz District, 116 herds were treated, totalling 1,184 head of stock, showing a total count of 4,143 warbles. Dewdney District, 88 herds, 1,717 head, 5,431 warbles. Pitt Meadows District, 89 herds, 1,533 head, 3,476 warbles. Atchelitz, 196 herds, 3,191 head, 5,700 warbles. Hatzic, 33 herds, 466 head, 859 warbles. Barnston Island, 18 herds, 303 head, 124 warbles.

It may be interesting to compare these figures with those of a year ago:—

Atchelitz: 1937—38 herds, 1,323 head, 3,483 warbles. (This is hardly a fair comparison, for in 1938 the area under control was more than doubled; thus it comprises one-half first-year treatment and one-half second year.)

Hatzic: 1936—47 herds, 603 head, 1,300 warbles. (There was no control here in 1937.)

Barnston Island: 1936—22 herds, 360 head, 1,158 warbles; 1937—21 herds, 305 head, 404 warbles; 1938—18 herds, 303 head, 124 warbles.

This last district gives the most encouraging picture and shows a substantial reduction in warble-count each year. Being surrounded by water, it makes an ideal control area although residents claim the fly crosses the river from Pitt Meadows District. This will be checked now that Pitt Meadows is under control. It is worthy of note that of the count of 124 warbles in herds on Barnston Island, 54 were found on one animal which had been brought from another district during the winter. Were it not for this one animal, the infestation would indeed be low.

Present indications point to renewed activity in this phase of work next spring, with the possibility of two new additional areas.

To sum up, six areas were under control this year, totalling as follows: Herds, 540; number of head, 8,394. The total warble-infestation on these 8,394 head was 19,733.

If all these six districts and two additional ones request control treatment next spring, it will be necessary to ask for some temporary assistance as this work comes on with a rush, and must all be done between the time the warbles are ready and the beginning of spring work.

Junior-club Work.

Interest in this work continues to be well sustained. Too well, in fact, for your Agriculturist to give proper supervision to it. This year, there were fourteen poultry clubs, fifteen calf clubs, two swine clubs, and five potato clubs; or a total of thirty-six.

The poultry clubs were organized through this office and then the work of inspection and supervision was left to the Poultry Branch. Similarly, as soon as the organization of the potato clubs was completed, they were left in the hands of the Dominion Certified Seed Potato Inspector for instruction and inspection. An attempt was made to pay at least

one visit of inspection to all the members of the swine and calf clubs, but there was not time to do the job properly. Every member of the live-stock clubs received one visit, but visits had to be made in too hurried a manner.

There seems to be less interest taken in swine clubs this year. It seemed difficult in the spring to get sufficient members, and then at judging time one club showed only seven and the other nine.

There was more interest shown in calf clubs, and Ayrshire, Holstein, and Jersey calf clubs made a splendid showing at Vancouver Exhibition. Then at Chilliwack five calf clubs and their owners kept the show-ring busy for a whole day. Other clubs were judged at Langley, Haney, Matsqui, Abbotsford, and Agassiz Fairs. The general type and condition of the calves shown is a great improvement on what it was a few years ago. Club members seem to have profited by the training in selection, feeding, and exhibiting calves. It appears to be a good idea to arrange one field-day for each club. Two such were held, but time did not permit any more.

The increase in the number of potato clubs is largely due to the good showing made by the two Poplar boys at the Dominion contest in Toronto last year, and also to the organizing work of the local leaders. The repeated success of the potato team at Toronto will probably again stimulate the work and there is a possibility of an increase in the number of clubs next year.

The two clubs organized last year at Langley and Poplar had no difficulty in disposing of their crop of certified seed this spring, and the Ladner and Richmond clubs disposed of their crop as commercial stock through Safeway Stores, Limited.

In the Ladner club, there were fifty-three members and in the Richmond club twenty-five, making a total of seventy-eight. Each of them grew one-tenth acre and this would mean between 40 and 50 tons graded stock which was marketed in this way.

One field-day was held for the two Richmond clubs, when your Agriculturist, in company with Dominion officials, inspected each plot and gave talks to the members. Similar field-days were held with the Langley, Ladner, and Poplar clubs.

The live-stock clubs were all judged at local fairs. Some of the potato clubs were judged locally and some at the Provincial seed show in November.

Junior Judging Classes and Competitions.

An effort is made to carry on judging classes in connection with each of these clubs, but it is not always possible to do it. Classes were organized this year at Richmond, Langley, Chilliwack, Ladner, and Abbotsford, and the work was then left to interested adults to carry on voluntarily. Some years this has worked very well and again, not so well, because while the will to help has never been absent some of our men find it hard to get the time. However, some very good work has been done this year, as the following paragraphs will show.

Judging competitions were held at each of the field-days mentioned above and also at Chilliwack and Langley fairs. A full day's practice judging competition was held at Agassiz Experimental Farm for the benefit of club members from the upper end of the Valley, and another of the same at Colony Farm for those in the district adjacent to Vancouver.

Your representative conducted and supervised each of these contests and also the main open judging contest held at Vancouver Exhibition. Here, there were six local teams competing, and from forty to fifty young people in the individual contest.

Langley and Milner teams won first and second place, with a Chilliwack team coming third. A poultry-judging team from Langley also won first place. All the work of preparing for this contest and of tabulating the results is done in this office. Your representative also supervised a similar contest at Victoria Exhibition.

During the Vancouver Exhibition week, the district elimination contest in dairy judging was held, also the Provincial elimination in potato judging. In the former case seven teams competed and in the latter four teams. The dairy contest was won by a Chilliwack team of Allan Keenleyside and Lloyd Tranmer, and the potato contest by Douglas Gilmore and William Ebbs, of Richmond. There being only one swine team eligible from this district, no local contest was held.

At the Provincial contest at Armstrong, the Chilliwack dairy team and the Chilliwack swine team were successful. This made a total of three teams from this district qualifying for the trip to Toronto—namely: Chilliwack swine and dairy and Richmond potato.

Final preparation of these teams for the contest at Toronto was carried on by the following: The potato team was trained by Mr. H. S. MacLeod, Dominion Potato Inspector, and his associates. The dairy team by Mr. Reg. Unsworth, of Chilliwack; and the swine team by Mr. James Manning, of Chilliwack, assisted by your representative. Your representative had the good fortune to be asked to go to Toronto to represent the Department at the Royal Winter Fair and to accompany the British Columbia teams on their way to the contest. It proved to be a very interesting and instructive trip, and it was particularly gratifying to see the excellent showing made by the British Columbia teams. This trip has been reported in detail already.

The Richmond potato team managed to win the championship by a small margin over an Ontario team, thus making the second win for this Province in two years. The dairy team scored second place, and this makes it the third time a British Columbia team has won second place, and each time the team came from Chilliwack. This establishes a record for consistently good work. The swine and beef teams each scored fifth place, which appears to be very good work considering the disadvantages they face, particularly the swine team.

It is also worthy of note that two British Columbia club boys won awards in the potato club classes at Toronto. William Ebbs, of Richmond, won first in the A.O.V. potato class with a particularly good sample of Netted Gems, and Bert Robinson, of Langley, got second in the Green Mountain class.

Lime Committee.

As was the case last year, the work of this Committee has occupied a great deal of time and entails a large quantity of clerical work and correspondence. In capacity of secretary to the Committee, your representative has attended some twelve meetings and handled up to date over 390 applications. These applications cover 3,535 tons, on which the total subsidy paid out amounts to $1,767.50.

The bulk of this tonnage is used on the Lower Mainland where it is most needed. A smaller quantity has been used on Vancouver Island and the Gulf Islands. A detailed report of the work of the Committee was submitted on April 1st last, covering the fiscal year of 1937–38, and another covering the current fiscal year will go forward April 1st next.

The change recently made in the method of paying out the subsidy is very much appreciated by this office, as it eliminates the work of making out and mailing the cheques.

Miscellaneous.

Between 75 and 100 threshermen have been contacted. Blank report forms have been sent to each, and when returned these reports have been tabulated and forwarded to Field Crops Commissioner.

On instructions, some time was spent conducting parties of visiting United Kingdom agriculturists through this district. On instructions also, assistance was given the steer-finishing project initiated by Safeway Stores, Limited. Two lots of twenty-four steers were placed with qualified farmers and the progress of this work is under advisement. Some cattle-buyers from the Interior have been aided in finding and purchasing their requirements. One day was spent judging school-gardens in the Haney District.

The usual routine of office work has been carried on, and records up to December 15th show as follows: Letters received, 989; letters sent out, 1,284; visitors to office, 879; telephone calls, 1,089; bulletins sent out, 406.

NICOLA AND THOMPSON VALLEYS.

Donald Sutherland, B.S.A., Kamloops.

In the general aspect climatic conditions throughout the year were not favourable for the optimum development of plant and animal life. Fortunately, certain compensating factors served to so temper conditions that in the final analysis the agricultural industry, from the productive standpoint, except in certain restricted areas, has not suffered to any extent.

Winter set in early in November of 1937 with heavy falls of snow. A partial thaw occurred in December, but which did not help the agriculturist. Before the snow had completely gone away cold weather set in again and almost the whole country-side was covered with a sheet of ice. Upon this, later snows in January and February piled up and stock

wintering out, particularly horses, had difficulty in rustling sufficient old growth to sustain life. Some losses occurred in the spring, but fortunately the winter was comparatively mild; otherwise losses undoubtedly would have been very heavy. Those with sufficient supplies were feeding steadily from mid-November to mid-April. Practically all available feed-supplies were cleaned up.

The run-off was a gradual one and the ground being free of frost almost all the moisture soaked in, which gave plant-growth a vigorous start in the spring.

June and July were hot, dry months and plant-growth in the dry-farming areas and the ranges suffered greatly as a consequence. Rains in the latter part of summer and the early fall provided good late pasture in the fields and on the ranges. Feed-supplies in some parts were limited, but the winter up to the time of writing has been an open one, and except for cattle being grain-fed for winter and spring sale stock have not had to be fed. Unless the balance of the winter should prove unusually severe and long, there should be sufficient supplies of feed to carry through. In fact the mild months of November and December should enable some to ship out alfalfa-hay held back in case the winter should prove severe.

Summing up the situation then, with the exception of the dry-farming areas around Kamloops and the non-irrigated lands of the North Thompson, crop returns were fair and feed-supplies, by reason of the open winter thus far, are sufficient to carry stock through to the spring.

Plant-growth.

Grain and hay crops while up to average in the irrigated sections were light elsewhere amounting to a 50-per-cent. crop. Potatoes though good in quality were lighter in yield by 20 per cent.; tomato and onion yields were reduced in the same proportion.

The movement of the potato and onion crops has been slow and draggy, the major part of both crops being still unsold. Fruit production showed a decrease of 40 per cent. in yield, though quality was good. Prices were fair and with a good demand the crop was marketed readily. Small-fruit areas of the North Thompson valley suffered severely from drought, both in yield and quality. Returns to the operators were only a fraction of those in the normal year.

Live Stock.

Live stock, particularly cattle, were shipped out in greater numbers than for some years past. Shipments of cattle from Kamloops and district for the first eleven months of 1937 totalled 4,476 head as compared with 6,772 for the same period this year. This may be explained by the fact that with no surplus feed-supplies herds throughout the country were sharply reduced. Prices of cattle were down from last year by a cent to a cent and one-half, due to the falling-off of prices in the States and consequent lack of sale for Canadian cattle.

Sheep and lamb prices were fairly steady and in line with the previous year's prices. The sheep-breeders report that wool shipments from the Province amounted to 360,000 lb. a considerable reduction from last year. The difference is due to quantities being held over on the prospect of higher prices next year and also because of a larger volume being sold privately for local use, a greater interest being taken in homespun-wool articles.

Palm Dairies, in Kamloops, reports a 20-per-cent gain over last year in butter-fat shipments. Unfortunately, prices are down by reason of the heavy stocks of butter in Canada at the present time. This, of course, is a general condition and does not detract from the generally healthier and more progressive condition of the dairy industry in this area.

Live-stock Shows and Sales.

By permission of the Minister of Agriculture, your representative again acted as secretary-manager of the annual Bull Sale and Fat-stock Show at Kamloops. In addition, this year a horse sale and show was held sponsored by the recently formed Interior Horse-breeders' Association, assisted by the Provincial Department of Agriculture. Both undertakings were highly successful. The cattle show and sale has done a great deal to promote the better breeding and feeding of commercial beef cattle in the Province. Following the successful beginning last year, horsemen believe that the horse show and sale can and will play an equally important part in furthering the progress of the horse industry.

Boys' and Girls' Clubs.

Six clubs were organized and meetings were held regularly through the summer months. Members completing the work totaled fifty-two, as compared with forty-eight in 1937. At Westwold a sheep club was organized for the first time. Entries were judged along with other club entries at the Kamloops Exhibition and were later sold at the Ram and Fat Lamb Sale and Show on October 1st, realizing good prices for the youthful contributors.

Seed-grain Distribution.

This office undertook the distribution of seed-grain advance by the Department to seventeen applicants in the district unable to purchase their requirements. The kind and quantities of grain advanced were as follows: Red Fife wheat, 2,400 lb.; Bluestem wheat, 4,400 lb.; Reward wheat, 1,300 lb.; Alaska oats, 3,900 lb.

The Alaska oats introduced the past two years have aroused great interest. For moist bottom-lands and in areas subject to frost, this variety is maturing and assuring farmers of grain where in the past they have given up any thought of being able to harvest a mature crop.

Warble-fly Control.

Assistance was given to the Live-stock Commissioner in his warble-fly control programme. Cattle in the Westwold area were treated for the first time. Material was also provided to treat the cattle owned by the Tranquille Sanatorium. In addition, material was provided to treat cattle in the Black Pool, Louis Creek, and Chinook Cove areas. At Black Pool results of past treatments have been so successful that no warbles were found this year on the cattle and the powder was not used. At Chinook Cove, cattle-owners were most appreciative of the programme and have requested already for continuation of the work next year. Returns are not all in as yet, and when received will be forwarded direct to the Live Stock Commissioner.

Grasshopper-control.

Considerable time was given to grasshopper-control work in the Kamloops and Nicola areas. The latter district in particular suffered a very severe infestation, but which was successfully fought and hoppers killed off in countless thousands.

A real advance was made in control methods. The Nicola committee developed the use of a dilute oil spray that has proven to be highly successful. A pressure-sprayer with two hose-lines was purchased and mounted on a truck. Diesel oil was used and emulsified with water with a casein spreader. In the early season a 10-per-cent. solution was sufficient to kill the young hoppers. Later on the strength was increased to 15 per cent. to kill the adult hoppers.

This method was very successful with the roadside hopper which hatches out in concentrated egg-beds. This fall forty-three breeding-spots were staked, and these will be visited by the spray-crew early in the season and should result in this species being virtually eliminated in the early part of the season allowing the bait-crews to concentrate on the Red Legs species. This should greatly reduce operating costs and as well prove a highly efficient means of control.

The Kamloops committee developed a mechanical bait-spreader unit under the guidance of Mr. I. Ward, of the Dominion Entomological staff, and a local firm constructed an experimental machine. The baiting crews, both at Kamloops and Nicola, made certain alterations found necessary and before the season was over the machine was doing excellent work. Those in charge calculated total savings of bait up to 50 per cent. were possible; one less man was required on the truck and, in addition, a perfectly safe and even spread was secured.

Farmers' Institutes.

Farmers' Institutes continue to be vital in the agricultural development of this area. One new institute was formed during the year at Westwold. A successful convention of District " D " was held at Kamloops on June 17th, your representative acting as secretary.

The district institute is sponsoring an Achievement Contest. A trophy for annual competition, provided jointly by them and the Department of Agriculture, will be awarded each year to the institute in District " D " judged as best fulfilling the aims and objects

set out for the institute organization. The institutes are keenly interested in the competition and several are making a determined effort to win the trophy this year.

The thought of setting up bulletin libraries at various points was carried out. Five units were prepared this year, each comprising some 300 selected bulletins. These were separated under various headings, numbered and catalogued and should prove very useful. The units are being placed with the Chinook Cove-Chu Chua Institute, Westwold Institute, Revelstoke Institute, the St. George's Indian School at Lytton, and the fifth retained in this office.

CHILCOTIN, WILLIAMS LAKE, AND CARIBOO.

G. A. LUYAT, B.S.A., WILLIAMS LAKE.

The marked improvement shown by a general rise in prices of agricultural produce sold from Cariboo and Lillooet Districts during the year 1937 was not maintained in 1938. Prices of all live-stock products declined slightly from the beginning of the year, and coupled with the fall in values was a severe drought which reduced field-crop yields and range-forage growth to a minimum. It is claimed that 1938 was the driest year on record for this district. A very light covering of snow was had during the winter, followed by no rain until August, the only month in which any appreciable moisture fell. During the autumn months only light showers were received from time to time until the first light snowfall of November 11th. From then on till the end of the year another several inches fell. Temperatures during the winter months of January and February kept fairly well on the mild side with the thermometer never registering lower than 20 degrees below zero at the higher altitudes. Summer frosts were entirely absent all over the districts, with the first signs of it making its appearance on October 10th. This made the longest growing season for many years on record. During the late fall and early winter the daily temperatures have been very mild, with only a few cold snaps occurring from time to time.

LIVE-STOCK INDUSTRY.

Beef Cattle.—The optimism amongst the cattlemen built up during the season of 1937 was lowered in 1938 through the poorer prices paid for cattle. With demands from the United States not as keen as in 1937 the prices paid were correspondingly weaker in British Columbia, but the market held steady on the grass-run cattle throughout the shipping season with a slight improvement showing at the end of the season.

Good cows had a particularly strong run on the market all season as well as bulls. This is probably explained by the fact that one packing firm in Vancouver made a specialty of putting cow beef on the market and the other firms had to follow suit in order to compete. Those feeding beef for the spring market of 1938 did not receive the advance in the market expected. In the fall of 1937 feed-lot men paid higher prices for store cattle than previously, all of which helped to cut the spread in the market to a minimum.

A large percentage of the cattle from this district this year again were marketed in Vancouver on consignment to commission agents operating on the Vancouver stockyards. The prices received in Vancouver were: Steers, $4.50 to $6 per cwt.; good heifers, $4 to $4.75; cows, $3 to $3.50. Feeder cattle at country points sold from $3 to $4, depending on the quality, with the demand quite keen.

Cattle were marketed early in the season in heavier quantities than ever before, especially during the month of August. Just why this should have been the case is hard to explain, because cattle were not finished off to the same degree as in former years by that month and, more so, there was a heavy crop of grain being harvested on the Prairies, with it price-declining making available cheap grain for the winter feeding of Prairie cattle, which would come on to the Vancouver market in the late fall in competition with Cariboo cattle; and following drought conditions and short crops, the Prairies had been depleted of their cattle population to a point where all cattle carrying insufficient flesh would be turned into the feed-lot. Prices held firm in Vancouver until the beginning of November, when a temporary decline intervened while Alberta unloaded some of her cull material. Towards the end of the year the prices advanced somewhat over the average of the shipping season.

Feeder Sale.—The first annual stocker and feeder show and sale held in Williams Lake on October 7th, under the auspices of the Cariboo Live Stock and Fair Association, was quite successful and brought good prices for the contributions. In fact the yearling steers and heifers commanded prices equal to those of 1930, the year in which cattle prices began to slump. A short crop of grass on the Cariboo ranges, and hay not overly abundant, but a bumper crop of grain on the Prairies all seemed to make the year opportune in which to hold this event for the first time. It had always been difficult to convince the cattlemen that feeder buyers will pay better prices than the packer or butcher for young grass steers and to enter cattle into a sale of this kind was one big experiment in the estimation of many.

There was confusion in some minds as to what properly constituted a feeder animal; the popular opinion being that the feeder buyer was looking for a thin stocker animal, failing to realize that extra fleshing on a feeder steer is cheaper bought by the feed-lot man than put on with grain and that he is willing to pay a premium over the packer price for it. The general averages covering both the show and commercial cattle entered in the sale were $4.68 per cwt. for calves; $4 per cwt. for two-year-old steers; $3.97 on the yearling steers; and $3.74 per cwt. on the yearling heifers.

From these prices it will be noted that the feeder calves did not sell to the very best advantage, but this was accounted for by the fact that entries in the calf classes were light and buyers would not take the risk of being caught with less than a car-load.

Well over 800 head of cattle were sold through this sale. Some herds were drifted over the trail 150 miles to take advantage of this market. At all times during the auction there was keen competition displayed, and the buyers were not able to fill all their requirements. It was estimated at the close of the sale that fully another 600 to 700 head could have been sold without difficulty. There were buyers and visitors present from all parts of the Province. This event was the first of its kind to be held in the Province.

On the day previous to the feeder sale the regular annual auction sale of beef cattle was held with 531 head entered. Many of these cattle were strictly feeders entered in the wrong sale, but it was difficult to convince some of the contributors of this fact. This sale has been an annual one since 1930 and the majority of the committee in charge favoured holding it in the usual way, although it was really a duplication of the feeder sale, considering that to-day good young grass cattle cannot be classed as anything but feeders. The outcome was that through advertising the first event as a beef sale it was patronized only by the beef buyers and they bought them at their own price, while on the following day at the feeder sale not only did the feeder buyers attend but also the packers, and with about thirty buyers in all bidding the price went up.

In order to accommodate all the cattle at the sale it was necessary to extend the P.G.E. Railway shipping yards, and to this end Mr. R. Wilson, general manager of the railway, co-operated to the fullest extent. With the new accommodation it is now possible to hold for sale purposes in small lots 1,200 head of cattle. It is expected that the feeder sale of next year will be a two-day event with the elimination of the so-called beef sale. A feeder sale here can be developed into an event of commercial scale and a yearly market where all the feeder and stocker cattle can be sold from the surrounding district at prices established by supply and demand. At some of the Prairie feeder sales as many as 4,000 head are sold within two days. The total turnover of the cattle sales, including the bull sale, was $49,061.82.

Bull Sale.—The first annual bull sale was held under the auspices of the Cariboo Live Stock and Fair Association on October 6th, with thirty-four Herefords averaging $133.32 and eleven Shorthorns making $98.53. Two Shorthorn females sold for $100 and $80. Sixty-one bulls in all were entered in the sale, but sixteen local registered range-fed Hereford bulls did not sell and were handicapped in being in the rough just off the range and not quiet. They lacked that bloom and growthiness looked for in well-developed yearling bulls. The top price paid at the sale was $250 by C. E. Wynn Johnson for "Ardmore Gay Lad 18th," a Hereford bull. "Sunnybrae Nabob," contributed by C. Turner, Westwold, sold for $180, also to C. E. Wynn Johnson. Other buyers in the white faces were Lord Martin Cecil, 100-Mile Ranch; Chas. Moon, Williams Lake; C. D. Hoy, Quesnel; H. Hill, Marguerite; St. Joseph's Mission; 150-Mile House; Duke Martin, Alexis Creek; and A. Furrer, Lone Butte. It may be of interest to note that five bulls purchased by C. D. Hoy, a Quesnel

merchant, were placed in the Nazco country where the cattle lack very much in breeding and where registered bulls have not been in common use.

The Shorthorn entries in the sale were made up from the herds of James Turner, Cadboro Bay; A. and W. Watt, Kamloops; Joe Bulman, Westwold; and W. W. Sharpe, Stettler, Alta. The top bull "Glengorm Newton," entered by the latter breeder, sold for $150 to Duke Martin. Other buyers in this breed were J. Wiggins, Miocene; R. Mulvahill, Chezacut; and R. C. Cotton, Riske Creek. The sale was rated as being quite successful and the contributors were very well pleased with their sales. It was somewhat of a departure from the usual custom of sales of this type, being held in the spring of the year. The offering was made up of long yearling bulls just off pasture and at an age when they do not show to the best advantage.

The sale was much needed as the majority of the Cariboo ranchers will not journey out to buy their bulls and, consequently, use grade bulls or trade older bulls amongst themselves. By so doing they have not given themselves a chance to become acquainted with the improvements and progress made by pure-bred breeders in the development of beef cattle. A local bull sale helps to meet this situation. The infusion of new blood into many herds is very necessary and practical when as much as 50 cents per cwt. extra is paid for steers from herds sired by pure-bred bulls of good type.

In regard to pure-bred herds maintained in the district, Mr. Dan Lee, Hanceville, has recently purchased forty head of Hereford cows with calves at foot of Domino, breeding from Hunter Bros., Olds, Alta. Mrs. R. C. Cotton, Riske Creek, maintains a large herd of pure-bred Shorthorns and Wm. Muir, Meldrum Creek, and W. Dingwall, 127-Mile House, are building up small herds.

Range and Feed Conditions.—Unless a heavy snowfall comes this winter the cattle-ranges may suffer a serious shortage of water. Water-holes and lakes were lowered considerably during 1938, owing to the light snowfall of last winter and continued drought throughout the summer. Ranges suffered considerably and only a very slight growth of grass was made immediately following the spring run-off.

The timber grazing was particularly good in comparison and cattle drifted back into such range and came out in good shape. Cattlemen in competing on commonage for open range have grazed these areas with almost complete destruction of the bunch-grass plants, to be succeeded with weeds of various kinds. If more scientific and modern grazing practice had been followed in the past by herding and distributing cattle in the summer to the cooler wooded ranges, resting off the open areas while in growth, our present much-overgrazed conditions would not exist.

The wooded ranges are well supplied with forage of the pea-vine and wild vetch types and are capable of growing an abundance of luxuriant grazing, but are as yet still virgin. Several stockmen from the Big Creek country drifted their market steers from their home range over into virgin range just beyond the Bridge River country for the summer, and later shipped them from Shalath on the P.G.E. Railway. The range was reported to be exceptionally good, but the steers although herded were restless and did not do as well as they should have in fresh range.

The hay-supply for the coming winter will be adequate on most ranches. Hay-crops were particularly good on the natural hay-meadows where flooding water was available, the extra heat of the late spring driving the growth. A normal crop was had under irrigation of alfalfa and mixed hay. Some of the smaller operators with little or no irrigation suffered and had to dispose of extra cattle.

Breeding.—The calf-crop for the year was somewhat under normal for the district, although a few reported an increase. In some herds the loss of young heifers at calving-time was heavier than usual following poor wintering and nutritional conditions. Losses in the calving two-year-old heifers are heavy enough under the most efficient management and hard to prevent. A part solution to the problem would be to spay all small undesirable heifers when yearlings and thereby cut down the death-rate of the calving two-year-olds, because no doubt the weakest, smallest, and poorest heifers are predisposed to calving-trouble. The spaying of heifers is an old custom practised formerly by the older cattlemen, but an art which has been lost to the younger generation because in the last twenty years or so "spays" have not commanded any premium over open heifers. Another angle to

consider in its favour under present conditions is culling to grade up the breeding herd, which alone justifies the practice. Old cows which are fast attaining an unproductive age but which are still having calves yearly can be spayed and sold profitably before they fall into the canner class.

Sheep.—The few small range bands of sheep remaining in the Cariboo have been dispersed along with some farm flocks, making a further decline in the number of sheep kept in the Cariboo district. At the present time there only is one large band in the Lillooet country, operated by Hayward, who has been wintering on Pavilion Mountain and ranging in the mountains adjacent to Bridge River. It seems rather a pity that more sheep cannot be kept in this immense territory, but several factors enter into the business which makes sheep production on a scale larger than a farm flock rather a hazardous occupation. The nature of the country, in the first place, does not lend itself very well to this type of production. The greater part of this district has a cover of brush which makes good summer sheep-range but under such conditions it is extremely difficult to secure the services of herders for any length of time. Cattle have the priority of rights on the open range. Predatory animals make it increasingly hard to run sheep in bushy ranges unless constant supervision is given them. There are always a number of people going into the business without previous experience, and when well into it their losses are so heavy that they throw up their hands in disgust and sell out, usually on a low market.

In the farm flocks the lamb crop was good. Lambs sold at $6.50 per cwt., which is 50 cents better than in 1937. The bulk of them were shipped at the close of the fair at Williams Lake after being shown there. Some 400 head were entered and were sold privately, the annual sale of these by auction being discontinued. The annual clip of wool was assembled at Williams Lake and shipped to the British Columbia Sheep-breeders' Association at the Pacific Coast Terminals. The shipment of 1938, a total of 8,026 lb., was the smallest amount ever shipped out by pool car and being 50 per cent. of the quantity shipped in 1937. With wool prices declining sharply in the spring some wool-growers were induced to sell privately. These private sales were in part responsible for the smaller shipment made in the pool car, the balance being due to the decline in the sheep population.

The breeding amongst the farm flocks seems to be mostly a mixture and in many cases of Oxford and Hampshire type. At one time the Oxford breed was the most popular, but with the market demanding a more compact cleaner-cut lamb blood of the quicker maturing breeds had to be infused. The demand for rams this fall has not been very keen, many still using grade rams.

Dairying.—Butter-fat has commanded a somewhat higher price all through the season. The highest price paid by the Quesnel Creamery was 36 cents during the month of March, while the lowest was 23 cents for August and September; these quotations being f.o.b. shipping-point. The make for the year will show an increase of 37 per cent. over that of 1937, which is outstanding in view of the dry year and a general shortage of feed. Except for a few permanently in dairying and operating well-bred herds, there does not seem to be much stability of occupation amongst cream shippers, the bulk of them producing cream only when prices are good or when employment away from the farm becomes slack. No grain feeding is done to dairy cattle anywhere in the district. In most localities there is an abundance of good summer grazing which offers splendid opportunities for several months of dairying at low cost of production.

Swine.—Local hog prices have kept up very well during 1938 and the demand for pork from the mining areas has been keen. There has been a very short grain-crop, making the finishing of hogs difficult. The swine industry in the Cariboo is unstable and this is probably so owing to the climatic conditions. Small farms growing little more than sufficient grain for feeding purposes in normal years have difficulties following seasons of drought or summer frosts when the total crop is almost *nil.* This means that some of the swine herd has to be sold off and later replenished when favourable conditions return. A few ranch operators run swine on a pasture system whereby only a very limited amount of grain is fed during the finishing month. Hogs run under conditions of this kind do not make their growth within six months and rarely ever reach market under a year old, and then can only be graded as poor feeders displaying the effects of over-grazing. Some would claim that

the net returns are much higher from hogs run under such a system, but the cost of the pasture is not considered in their calculations.

The breeding of swine in the Cariboo is pretty well confined to the Yorkshire, with some crossing with Tamworth. A few breeders are using Berkshire boars on York sows, expecting the resultant cross to make up for what should be more generous feeding. Only a part car of hogs was shipped to the Vancouver market over the season, the balance being used for the local mining trade. Weather conditions in the spring were ideal for farrowing and normal litters were had.

Horses.—Good draught horses are in keen demand and hard to get, although the supply is gradually being built up through the use of more registered draught stallions which are being imported from year to year. Clydesdale registered stallions either for travel or ranch use have been kept by nine ranchers, and registered Percheron stallions used have been kept by two ranchers in this district.

The Percheron colt brought out from Alberta in 1937 by Zirnhelt & Sons was sold to the Chilco Ranch this year. This horse travelled between Soda Creek and Quesnel in 1937 under contract to the Cariboo Horse-breeders' Club and left twenty-one living colts, all showing good promise of size with plenty of substance. In 1938 Yorston Brothers contracted their Clyde colt "Bonny Laddie" to the club and covered the run from Australian to Quesnel three days per week by truck. This club has done good work in replenishing the district with good horses on the small mixed farms where it is often hard to find a horse to suit and the money is not always plentiful with which to buy. In another two or three years the supply of horses in the district should be adequate to meet the needs of the district.

In light horses more interest is being taken in the development of saddle-horses for range work. Lac la Hache has quite a number of stocky mares in foal to a thoroughbred stallion purchased from the Kamloops District two years ago. This horse is coupled properly to breed cow ponies of the right type. The thoroughbred stallion "Terrifier" is now on the Anahim Reserve. This stallion of good racing blood is 15 years old and at an age which demands good attention. The thoroughbred "Student," owned by the 100-Mile House, although old is leaving fair saddle stock. High-class saddle and cow horses command prices ranging from $100 to $150.

Poultry.—The poultry industry is slightly on the up-grade in the Cariboo District but the egg requirements are far greater than the supply. As yet there are only a very few men engaged in egg production on a commercial scale, the bulk of eggs coming from poultry kept as a side-line. Even with the buying of all the grain fed to a flock, eggs can be produced profitably, providing sufficient skim-milk and green feed needed by the flock are available from the farm.

The initial outlay required in a small commercial proposition is small and should not create an obstacle to some settlers engaging in the business and making themselves self-supporting in very short while. Eggs generally market at 5 cents more per dozen than in Vancouver, and give the local producer a slight edge over the distant producer and, besides, they reach the consumer in a fresher condition. Turkeys for the Christmas market brought the producer from 25 cents to 30 cents per pound. One ranching company raised and marketed 250 birds of exceptionally good quality. Many turkey-raisers have the failing of allowing their birds to forage and rustle for themselves without a grain supplement, thus developing underweight birds for market.

More and more cattlemen are appreciating the value of feeding a mineral supplement. That used here has been the product "Mono-calcium Phosphate." From all reports, mineral where fed intelligently has done good work in leaving stronger calves at birth, more vigorous cows around calving time and an increased calf crop. On many ranches more generous feeding and a better quality hay is all that is required but cattlemen in such cases expect a mineral supplement to cover up the damage done by short rations. The feeding of a mineral is particularly helpful to cattle when wintered on low quality swamp hay or hay that has reached a state of high maturity.

Hay.—Even though there was only a very light protecting snowfall last winter no winter-killing of alfalfa resulted. Irrigation-water was not very plentiful on some ranches, and had to be conserved to reach the more distant hay-meadows in order that a light watering might be given. The natural or swamp meadows where flooded yielded higher tonnage

than in the previous year, owing to the heat prevailing during June and July. On the whole well-irrigated alfalfa yielded a normal crop. Hay-crops on the mixed farms where practically no water is used produced a very meagre crop.

The first rains of the season came during the month of August, leaving the ranges and all unirrigated crops without sufficient moisture to make any appreciable yield. Districts lying in the eastern portions of Cariboo, where the precipitation is normally heavy enough for crop-growing, suffered tremendously from the continued drought. All hay-crops cut in July were harvested in the best of condition and under ideal weather for curing. Some trouble was experienced with the second cutting of alfalfa and wild-meadow hay in August and September when intermittent showers delayed operations.

The grain yields were almost *nil* in many sections of the Cariboo. On some ranches water had to be turned in before germination could proceed in the spring.

Insects and Pests.

Annual meetings of the South Riske Creek and Clinton Grasshopper-control Areas were held on October 22nd and November 8th respectively. The amount of $161.17 only was expended on the South Riske Creek Area and quite a fair amount of supplies are on hand for next year. The grasshopper beds which were mainly concentrated on the lower river-benches in 1937 were then poisoned very efficiently. Later a fungus plague followed, wiping out those hoppers which had scattered in small numbers but widely over the range. This year's infestation was very light, demanding a very small crew a short while to hold them in check. Very good work has been done on this area in the last few years.

In the Clinton zone the expenditure was $974.83. Here the hoppers were spread over a much wider country, and material had to be transported in a mixed state long distances in order to poison the smaller outbreaks here and there. The committee in charge of this area very wisely do not allow mixing-pens to be made unless they are of a permanent structure with a tight mixing-floor. These corrals are properly labelled with a poison-danger sign warning uninformed people against turning saddle-horses or live stock into them. Old poorly constructed mixing-pens first used when this work began have been torn down and the poisoned ground covered with stones. Dangers to live stock have been eliminated as far as it has been humanly possible. All cattle operators are well satisfied with the measures taken towards this end. No crops were destroyed within the area by hoppers during the year.

The infestation which was general along the Cariboo Highway from the 100-Mile House to Williams Lake has abated. Here outbreaks never last more than a year or so, because the type of country is long, narrow valley, and hoppers, seemingly in having no sense of direction, fly into the timber where laying is impossible, thereby exterminating themselves. No trouble was encountered in the vicinity of Williams Lake.

Pests.—The woodchucks in the vicinity of the 150-Mile House have been pretty well cleaned out with the use of Cyanogas. The Columbia ground-squirrel is not receiving the attention it should with all the means of control placed at the disposal of the settlers. A further demonstration was given on the Woodjam Ranch in the Horsefly District in hopes that it would stimulate efforts to exterminate this rodent. Game Warden L. Jobin, who has travelled the North Thompson and Fraser divide in summer, claims that this country up to a 4,500-foot level is alive with this rodent. This being the fact, it will take several years of conscientious work to exterminate them to a point where they no longer are a factor in crop-growing. In any case very little effort is made on the part of settlers to help themselves in this respect and it is found that Cynogas pumps are going rusty from non-use.

General.

Under the direction of the Provincial Horticulturist thirty-four experimental apple-trees were put out in the Soda Creek District. These are of the hardier varieties of apple and some crabs. Two growers were selected with different soil types and moisture conditions: Mr. J. Dyas, with a light sandy loam and no irrigation, and Mrs. T. Douglas, with a gravelly well-manured soil and an abundance of irrigation-water. In checking over the trees in late fall it was found that all had done well; those under the care of Mrs. Douglas had made better growth under the well-fertilized and irrigated conditions.

Crested wheat-grass stands last season suffered from the drought, but did better than stands of other types of hay or grass under the same conditions.

Wool handicrafts in Cariboo are getting established, although Mr. and Mrs. J. Firrell, of Lone Butte, as a result of some Department extension in 1935, have made some remarkable progress in this work, now making a finer spin, enabling them to weave men's scarves. From this work they have been able to derive a gross income of $25 per sheep from their farm flock. In other words, in their spare time during 1937 they made $200. It might be stated that " where there is a will there is a way."

SKEENA AND BULKLEY VALLEY.

S. G. PRESTON, M.S.A., SMITHERS.

The whole growing season was free from frost, and only for this reason was it possible to obtain garden products or grain. One or two frosts during the growing season would have set crops back beyond recovery.

A mild fall, with some rain late in October and in early December, has replenished in part the supply of soil-moisture. It also started some creeks flowing, thus ensuring water on most farms for the winter.

Weather was excellent for haying and harvest. Grain was threshed early and most of the fall ploughing completed before freeze-up, although some soils were rather too dry for good ploughing.

Pasture became scarce in the summer for dairy cattle, but there was plenty for beef cattle where they were ranged away from the farming area.

Of the areas covered by this report—namely, Terrace, Hazelton, Bulkley Valley, Lakes District, and Nithi River—the Lakes District suffered least for lack of moisture, while the south and west slopes of the Nithi River District were almost barren.

FIELD CROPS.

All field crops were approximately one-half the expected yields. While the amount of timothy-seed is very low, this is due to farmers cutting more than the usual acreage of timothy for hay. There were two reasons for so doing: (*a.*) On farms carrying a considerable number of live stock it was necessary to cut a greater acreage for hay than usual to obtain feed for winter. (*b.*) The prospects for a remunerative price on timothy-seed did not appear encouraging, so a number of growers cut for hay with the view there would be a better price for hay than seed.

Yields.—The following table shows the total yields of the various crops for the past three years and the 1938 percentage of the 1936–1937 average:

Crop.	1936.	1937.	1938.	Average, 1936–37.
				Per Cent.
Spring wheat (bu.)	15,117	14,294	8,210	55.8
Fall wheat (bu.)	390	4,567	739	29.8
Oats (bu.)	66,480	43,336	31,727	57.7
Barley (bu.)	9,403	15,310	5,964	48.3
Peas (bu.)	76	1,251	8	------
Rye (bu.)	72	128	44	23.2
Timothy (lb.)	1,132,411	1,570,860	290,918	21.5
Fescues (lb.)	-------	3,300	1,400	------
Brome grass (lb.)	6,000	8,000	------	------
Crested wheat grass (lb.)	900	1,200	800	76.0

This table does not accurately represent the effect of the season on crops, as acreages of various crops vary year by year, but the total acreage of spring wheat, barley, and crested wheat grass would be higher in 1938 than previous years.

SEED-GRAIN DISTRIBUTION.

Seed-grain was scarce in some sections of the district in the spring. The Lakes District, having suffered from frost during the growing season in 1937, particularly was short of

seed. Most of the seed-oats required was obtained from Vanderhoof, while seed wheat and barley needs were furnished by the Smithers area. A good deal of work was done by your representative at that time to ensure sowing of reliable seed. While there were a number of complaints regarding weeds present in some of the Vanderhoof oats, this was natural when an unexpected demand for seed occurred. The opportunity was taken to impress growers with the necessity of growing varieties suited to their district and in using clean seed. A shipment of No. 1 Alaska seed-oats was sent in by the Provincial Government and distributed from Fort Fraser, Fraser Lake, Endako, Burns Lake, and Telkwa. This grain was sold to the farmers at 75 cents a bushel.

Timothy-seed Sales.

Prices on timothy-seed were fair at the first of the year but quickly dropped when seed began to move. None of the 1937 crop was sold until the New Year. Prices ranged from $4 down to $2.75 per hundred, f.o.b. shipping-point, for No. 1 seed, with an average of approximately $3. Further, there was little demand for No. 2, so the carry-over is chiefly of this grade. The following table gives the approximate distribution of sales:—

	Tons.
Francois Lake	80
Bulkley Valley	320
Houston	40
Barrett Lake	40
Woodmere	20
Private sales	60
Total	560

Approximately 5 tons of the 1938 crop has been marketed at $5 per cwt., f.o.b. Telkwa. This, however, does not indicate the expected price as there are no quotations as yet from the dealers, but very little increase in price is expected.

Field Crop Union and other Tests.

A number of farmers took advantage of the Field Crop Union to test out various crops or start themselves in some particular crop. The following list gives the experiments tried and the number of farmers taking same:—

(1.) Testing five perennial grasses: Western Rye, Brome, Crested Wheat, Meadow Fescue, and Tall Oat	1
(2.) Testing grass mixture for Beaver Meadow	1
(3.) Fall Rye (Storm)	2
(4.) Fall Wheat (Karkov)	7
(5.) Olli Barley	2
(6.) Chancellor Peas	4
(7.) Parkland Brome Grass	1
(8.) Crested Wheat Grass	10
(9.) Grimm Alfalfa	7
(10.) Ladak Alfalfa	3
(11.) Columbia Russet potatoes	1

These fields were mainly inspected during the season, but the grasses, alfalfa, and fall grains were not seeded in most cases until there was some indication of moisture being available.

The Olli barley produced excellent quality grain, but was about one-third to one-half crop due to lack of moisture. Only two alfalfa stands were observed; that at Tatalrose had a growth of 4 inches on July 21st and was a complete stand, while the one at Smithers was seeded on a garden-patch but had grown only on a few of the moisture portions. The Columbia Russet potatoes grown at Telkwa were of excellent quality and gave a good yield.

Early in 1938 a policy was approved whereby farmers could apply for sufficient alfalfa, red clover, or alsike clover seed for up to 5 acres at half the delivered price. During the season 100 lb. of alfalfa, 138 lb. of red clover, and 73 lb. of alsike clover were distributed to fifteen farmers in amounts ranging from 10 to 35 lb. A number of the growers report

satisfactory growth of the seed obtained, but with the dry season this growth is limited, so no satisfactory report will be available until 1939.

Two pounds of Elite stock seed of Swallow timothy and a sample of the IM-37-1 strain of alfalfa were received from the University of Alberta for test. The Swallow timothy was sown at Quick and the alfalfa at Smithers. The Swallow strain of timothy is an improved forage type and appears to be much superior to ordinary varieties for grazing or hay. The IM-37-1 strain of alfalfa is one of the best obtained under Edmonton conditions for general usefulness as well as seed-setting ability.

Live Stock.

Very little can be said with regards to changes in the beef situation. A slow but continuous attempt is being made by producers to raise an improved and more uniform type. The Hereford breed is the most popular in this district, with very rare inquiries for Shorthorn or Aberdeen Angus breeding stock.

Shipments of live stock to the market show an increase over 1937. This is due to three reasons: (*a*) Shortage of feed, making wintering-over of more than necessary stock impracticable; (*b*) slight increase in price over 1936 and 1937 levels for the first part of the season at least; (*c*) buyers making more than usual efforts to obtain cattle. There is a tendency when a buyer calls on a farmer and makes an offer for a few cattle that he will accept the offer, especially if he has less than a car-load for sale.

The following table shows the shipments of live stock from this division for the past year, as supplied by the Smithers Division of the Canadian National Railways:—

From.	To Vancouver and New Westminster.	To Prince Rupert.	Total.
	Car-loads.	Car-loads.	Car-loads.
Burns Lake	15	13	28
Forestdale	3	----	3
Topley	5	----	5
Knockholt	3	----	3
Houston	3	----	3
Barrett	1	4	5
Quick	1	----	1
Telkwa	6	7	13
Smithers	2	----	2
Hazelton	----	1	1
Terrace	----	2	2
Totals	39	27	66

Included in these figures are 89 sheep from Burns Lake and 89 sheep from Fraser Lake.

The following figures show the comparision of live-stock shipments in 1938 to 1936 and 1937:—

Shipments.	1936.	1937.	1938.
From Bulkley Valley District to—	Car-loads.	Car-loads.	Car-loads.
Vancouver and New Westminster	27	24	39
Prince Rupert	25	26	27
Edmonton	----	5	----
Totals	52	55	66

Dairying.

There is a definite increase in interest in dairying. The points which make this obvious are as follows:—

(*a*.) Building and actions with regard to placing of creameries. This year a new creamery is being put up at Telkwa. The old creamery at Vanderhoof has been pur-

chased privately and a strong agitation is being made to have this installed at Burns Lake. While the latter appears improbable at the time, it shows that farmers and business-men are becoming aware of the relation of dairying to a sound and permanent type of farming.

(*b.*) Two Ayrshire bulls were brought into the Uncha Valley in 1937. This area is a part of the Lakes District and, while this district has previously been concerned only with beef and timothy production, the introduction of dairy cattle and leguminous crops in the past two years indicates a definite trend toward a more diversified type of farming.

(*c.*) Use and exchange of suitable bulls. Several young Holstein bulls were sent in by the Holstein-Friesian Association a few years ago. The result of their breeding is just now beginning to show. Credit is due also to the supervisor of the Bulkley Valley Cow-testing Association, who has gone to a deal of trouble to see that the bulls are exchanged and proper breeding lines followed when possible.

(*d.*) Natural spread and seeding of leguminous crops for feed. The results of feeding grain and timothy hay for milk production were not at all encouraging, but in the past few years there has been a very great increase in the clover content of the hay. Further, people are seeding clover and some alfalfa each year. These feeds are more palatable to the cattle, as well as requiring less grain than straight timothy.

(*e.*) Long winter-feeding and low price for beef. This has discouraged the beef industry to a large extent, but where the dairy cows are fed properly during the winter they give a return for the feed instead of merely maintaining the animals until they can again get on the grass.

Warble-control.

A definite drive was made to induce cattle raisers to treat their animals for warbles. This pest is not serious in any part of this district, but it was felt advisable to start control before it became worse, as nearly all cattle have a few warbles in the spring. Consequently, measures were commenced through the Bulkley Valley Farmers' Institute, the Quick Farmers' Institute, the Uncha Valley Farmers' Institute, and the Bulkley Valley Cow-testing Association. There were thirty-six applicants from the Bulkley Valley with 618 cattle, for which Deraten was supplied by the Department. This material was distributed with instructions on times and method of application. Not all reports are yet received, but from those obtained the following results are indicated:

First application, March 25th to April; Second application, April 15th to April 30th; number of cattle treated, 618; average number of warbles, 6.4+; total, 3,980. Average results, good.

A number of the farmers have been treating their stock for two to four years, and these found there was an average of only one to three warbles per animal, while animals previously untreated occasionally had as many as fifty to sixty warbles.

Swine.

Hog-raising is at present at a standstill. A few are raised each year for local needs and some for the Prince Rupert market.

A number of excellent pigs are produced each year at Terrace. Most of the feed has to be purchased so only a limited number are raised on each farm where they can be partially fed from scraps from the house.

Sheep.

A few sheep are kept on several farms, but only for local use. A number of farmers find them a profitable side-line, but would not raise sufficient to require herding or extensive fencing. Predatory birds and animals are a drawback to sheep-raising, so those produced have to be kept near the farm buildings.

Horticulture.

General.—The dry season affected the growth and productivity of fruit-trees, small fruits, and gardens. A cold spring at blossom-time, during which bees could not assist in pollenization, is considered the reason for the poor setting of fruit in the Terrace District. While 1937 was an exceptionally good fruit-year, the yield in 1938 was generally about half

to one-third of the average. Sweet cherries were almost a complete failure, but the cooking cherries were fair. A few of the orchards produced a medium crop of apples, but those in sod were very poor. The berry-crop was about sufficient for Terrace needs. A few cases were shipped to the Bulkley Valley, but in turn some strawberries were shipped into Terrace from Vanarsdol and adjacent points.

While yields of potatoes and other vegetables were generally light, the quality was excellent. There will at least be sufficient of all vegetables for local use, while several carloads of potatoes have been shipped to Prince Rupert. Shipments of potatoes are chiefly from Doughty and Hazelton.

Experimental Apple-tree Planting.

A number of hardy types of apple-trees were again supplied by the Department of Agriculture for trial in this district. Of eighty-one trees received, sixty-three were from the Central Experimental Farm, Ottawa, and eighteen from the Morden Nurseries, Manitoba. These were used to replace winter-killing from previous plantings as well as four new lots being set out. The trees this year were two- and three-year stock and appear to be more satisfactory than the ones sent in in 1937, which were older and suffered a good deal of winter-killing as well as failing to survive when planted.

Iris Distribution.

Two shipments of iris roots were sent by the Department to this district. These were kindly supplied by Robert Murray of Victoria. These were distributed in lots, of chiefly twelve, to various people between Hazelton and Burns Lake. Instructions for care and planting were given when delivered.

Poultry.

There is very little to report with regard to poultry-raising. This stays at about the same level year by year. A number who raise poultry for eggs or meat and give them proper care find it a remunerative side-line, for there is always a shortage of eggs in the fall and a good market for dressed chickens and turkeys. Some particularly good turkeys are raised in the district and the producers find a ready market at Christmas-time.

The poultry club has for two years produced Rhode Island Reds and this year members were able to market some good dressed chickens.

Junior Clubs.

The clubs organized in the Bulkley Valley District numbered four, with a total membership of thirty-six boys and girls. Membership indicates those finishing the projects. These clubs were at Terrace, Smithers, Telkwa, and Southbank. There was one less club than for 1937. Although a number more wished to join the dairy calf club, they were not able to secure suitable calves. None of the clubs was considered of sufficient merit to warrant sending a judging-team to compete at the Provincial eliminations at Armstrong.

The pigs of the Terrace Swine Club were judged on the farms by Mr. B. West and myself. The calves of the Bulkley Valley Dairy Calf Club were shown at the Telkwa Barbecue on September 5th and were judged by Mr. K. McBean, Superintendent of the Bulkley Valley Experimental Station. The Uncha Valley Club was judged by Mr. A. Howell, C.T.A. Supervisor, Smithers. The boys and girls of this club brought their calves to a picnic and field-day held at the Uncha Valley School. Besides placing the calves, local competitions were held on calf-judging and showmanship. For the poultry club, each member was asked to pick out a pen of two pullets and a cockerel. They were scored and their placing based on these scores.

Weed-control.

There were few complaints this year with regard to weeds. Utilizing the weed chemical sent here in 1936, some experimental work was done to ascertain the best time of year to spray perennial weeds to obtain the best results. Accordingly, ox-eye daisy, Canada thistle, and couch-grass were sprayed in the spring, summer, and just previous to freeze-up. The earlier sprayings have not given the results desired, but trials with couch-grass in other parts of the Province indicate that the late sprayings will be more successful. Some work

was done with dandelions, especially on lawns. A number of chemicals have been suggested to control this weed without materially injuring the lawn. This year kerosene, copper nitrate, and light and heavy applications of Atlacide were used. In all cases results were negative. The outside leaves of the dandelion would be killed, but new growth always came up from the centre.

NECHAKO AND PRINCE GEORGE.

James Travis, Prince George.

A plan for the promotion of bee-keeping during 1938 being under consideration, meetings featuring this project were promoted.

A warning was issued to all Farmers' Institutes and prominent growers regarding the advisability of securing tests on seed-grain suspected of being frosted in the fall prior to harvesting. Plans for pure alsike-seed production were formulated.

The first treatment of cattle for the control of warble-flies throughout the defined Pineview area was administered by local volunteer inspectors. The Derris powder formula was used.

Package bees, purchased on behalf of applicants, arriving from California by mail and express, were attended to and installed on behalf of owners. Fruit-trees, apples, on arrival, were repacked and consigned or delivered to selected growers. Several purchases of pure-bred boars were negotiated. Meetings in connection with gopher-control throughout McBride, Croydon, and Dunster Districts were attended. Boys' and Girls' Clubs were organized at eight centres.

Ploughing-matches.—Two ploughing-matches were featured during the month of June; one—the seventh annual—at Vanderhoof, at which Indians and whites competed; the other —Hixon-Woodpecker District, second annual—was held at Woodpecker. More than usual public interest was displayed at both centres, many farmers and business-men were in attendance.

At Vanderhoof a weed-chemical demonstration treating perennial sow-thistle was carried out on the roadsides.

Professor G. M. Shrum, in charge of arrangements for the establishment of Youth Training Centres, was assisted in formulating plans to include this territory.

The Central British Columbia Seed Fair was held this year at Vanderhoof on November 2nd. A substantial increase in the number of exhibits was recorded, together with greater evidence of public interest. A new feature was introduced when members of the Nechako Junior Grain Club exhibited their samples of Legacy Oats grown from registered seed. A number of the exhibits were considered by the judge as qualified to enter the Provincial Seed Fair at Vancouver, which resulted in the following prizes being awarded: Alsike clover, two firsts, two seconds, two thirds, and one fourth; red clover, one first; oats, one first; wheat, 1 fourth; field peas, one third; canning-peas, one first.

Under his direction classes of two weeks' duration were conducted at Southbank, Telkwa, Vanderhoof, Woodpecker, and Prince George; Mr. Kenneth Caple and staff being in charge. Courses of instruction in practical agriculture, soils, field crops, live stock, handicrafts, foods, nutrition, clothing, and health were given. Judging from the generous attendance, local interest, co-operation, and enthusiasm with which this project was welcomed throughout the districts where centres had been established, the popularity and success of these schools is assured.

Field-crop Notes.

The alsike-seed crop throughout the Prince George and Vanderhoof areas threshed out at less than the previous year, although the very short crop last year, with consequent high prices, and the excellent condition of the alsike-fields available for seed this year, induced farmers to plan a large increase in acreage. This shortage of alsike clover is largely due to weather conditions, which accounted for many fields being winter-killed through lack of adequate snow-protection and the surviving fields having to face one of the driest seasons on record for this region. In 1937 for the district surrounding Pineview, Woodpecker, Salmon Valley, and Vanderhoof a seed-crop of 150 tons was recorded, compared to a total of approximately 40 tons from the same area this year. (This figure is only pre-estimated, as threshing returns are not fully recorded at time of writing.)

Prices of this commodity are also comparatively low; 1937 No. 1 grade averaging 20 cents per pound and this year the grower is receiving 10 cents per pound for equal grade—a price more nearly in line with the average for normal years.

Canadian alsike has a good name in Europe, and provided values are moderate no trouble is expected in finding an export market. Of all our field seeds alsike clover finds the readiest sale, probably the reason lies in the fact that over a long period of years Canada could be expected to produce a volume of alsike of uniform quality; hence European buyers came to look upon this country as a steady source of supply.

Yields of hay are reported reduced from 25 per cent. to 50 per cent. of normal; exactly the reverse of 1937, when there was a sufficiency of mixed hay and sheaf-oats on hand. The quality of the present crop is excellent, having been harvested and stacked under favourable conditions.

In the immediate vicinity of Prince George and extending southwards light crops of oats, wheat, barley, and fall peas are recorded. Westward throughout the Vanderhoof District the situation is slightly improved. In this neighbourhood more cultivated acreage per farm unit is available and summer-fallowing is practised, a feature which is responsible in a large measure for the increased returns. The total crop for the Nechako Valley will not exceed 30,000 bushels this year. Approximately one-quarter of the acreage was cut for feed owing to the lightness of yield. Elevators at this point report grain purchases of approximately 16,000 bushels, with company sales approaching 5,000 bushels, and farmers' own sales at 3,000 bushels. No cars have been shipped out to terminals this year, in contrast to twenty cars of the 1937 crop. The elevator has paid a premium for oats. It would appear that what is left of the present crop will be required to supply local demands along the railway line.

Special terms were arranged whereby a limited number of growers could secure alfalfa and red clover seed at attractive prices to enable them to investigate the possibilities of these crops in their respective districts, especially as to seed production.

Seed-cleaning Machinery.

Production of grains, clovers, and grasses, both from a commercial seed standpoint and as a step toward seed improvement by means of acquiring reliable local grown seed, is claiming the attention of farmers throughout the eastern district, particularly in the McBride area. As a result of this interest the McBride District has been assisted in establishing a modern seed-cleaning plant which, it is expected, will be put into operation immediately.

Horticulture.

Continuing the system introduced in 1937, under direction of the Provincial Horticulturist, whereby hardy varieties of apple-trees were placed with fourteen selected growers, these individuals again received a quota of the 1938 shipments, and seven additional growers were added to the list. A survey of plantings as at November, 1938, indicated that for the years 1937 and 1938 the total number of trees distributed was 261. Of this number 9 per cent. died, 19 per cent. killed back but alive above graft, and 72 per cent. are strong, healthy trees.

A shipment of 300 plants in six varieties arrived from the Central Experimental Farm, Ottawa, during late October, 1937, the plants being immediately placed with growers situate respectively at Willow River, Woodpecker, and Prince George. Of these plantings only a few stragglers have survived, failure being attributed to late planting, winter-killing, and subsequent unfavourable weather conditions.

A general rural distribution of a quantity of choice varieties of iris throughout this area was made possible by a donation from Robert Murray, a private grower at Victoria, to the Provincial Department of Agriculture. This generous addition to some sixty-five farm home-gardens was much appreciated, and the natural increase by multiplication will provide for further distribution and extension on future occasions.

The demonstration apiary located at Pineview in the spring of 1937 continued to function this year. There is now a notable increase in the number of settlers who are keeping one or two colonies on their farms, the primary object being to increase the domestic bee population throughout the clover seed-growing centres. Surplus honey finds a ready local market,

and already signs of preparation to meet this demand are in evidence among bee-keepers. It is estimated that the number of hives in the districts of Beaverley, Giscome, Isle Pierre, Pineview, Salmon Valley, and Willow River, is between fifty to sixty.

Live Stock.

There is still a demand for a heavier type of horses for farm-work. The Belgian stallion " Farceur Boy " is again responsible for some nice, blocky colts throughout the Pineview and Woodpecker Districts. This is the only registered stallion in use locally at the present time.

Faced with an acute feed shortage, slaughterings and sales to buyers of old cows and surplus stock were heavy, particularly during the months of September and October. Movements of car-lots of cattle to Coast markets exceeded that of last year. Beef cattle and swine prices have followed the Edmonton and Coast quotations.

Car-loads of cattle handled over the Smithers Division of the Canadian National Railways, January 1st to November 30th, 1938: Totals, 33 cars to Vancouver and New Westminster and 7 cars to Prince Rupert.

There were no straight car-loads of sheep shipped this year, but included in some of the cars were 89 sheep from Burns Lake, 89 from Fraser Lake, 84 sheep and 121 lambs from Vanderhoof. It is also noted that there were 27 hogs shipped in a car of cattle from Prince George.

The dairying industry continues to advance steadily. A new creamery is under process of construction at Telkwa under the same management as the plant located at Prince George.

Due to the critical situation which has developed throughout the Dominion through increased butter production during the summer months, the wholesale price at this point is now 24 cents. The prevailing local butter-fat prices point to 21 cents for special and 19 cents for No. 1. Prices were correspondingly approximately 5 cents higher in 1937.

Diseases and Pests.

The campaign directed towards the extermination of gophers throughout the eastern district during 1937 was continued on a more extensive basis this year. The Farmers' Institutes along the line have been encouraged to take hold of the situation, with the result that the centres around McBride, Dunster, Croydon, and Valemount are equipped with Cyanogas pumps and co-operative purchases of Cyanogas have been made. Two foot-pumps are controlled for loaning purposes by the District Agriculturist's office, and quite a number of privately-owned pumps are recorded. The use of Cyanogas is proving the most popular and effective system in the extermination of these rodents.

Throughout the Pineview District the campaign of assisted warble-fly control was continued during the past season, when three inspections for treatment were undertaken, thus completing the third year during which the district has been under control. Much success has attended this project which will be continued next year.

Local Activities.

The year 1938 will be remembered for certain historical facts which are intimately connected with the development of Central British Columbia with the City of Prince George as the focal centre:—

A regular weekly air-mail and passenger service between Vancouver, Prince George, and Fort St. John in connection with the Whitehorse–Yukon service was inaugurated in July.

Soil-classification work was started and mapping work was done between Shelley and Woodpecker, embracing an area of approximately 125,000 acres of classified soils.

The advance guard of the Monkman Pass Highway road-builders, working from the Alberta Boundary, succeeded in reaching Prince George early in November.

PEACE RIVER BLOCK.

T. S. Crack, Pouce Coupe.

It was not necessary to have any seed-grain brought into the district this year as there was enough left over from last year's crop to supply the needs. The past growing season was a very dry one, not having a good general rain from seeding to harvest. The wheat

averaged 15 bushels and the oats about 25 bushels per acre. At the present time there is plenty of seed-grain in the district to take care of the needs next spring. However, the difficulty is that farmers are shipping to the elevators, and the small holder is not able to buy as, generally speaking, he does not have the cash to pay for the seed.

The hand-cleaning machines throughout the district, which were purchased through Government assistance, continue to do splendid work. The power-cleaner at Rolla did good work last year, but at the present time it appears that difficulty is going to arise this season to get a capable man to run it, and owing to the difficulty in the past with this machine I would recommend that it be taken down to Pouce Coupe and stored for the time being in the Public Works Building.

The Chief Veterinary Inspector visited the district during the month of August, tested over 500 head of cattle for T.B., and found four reactors, all in the same herd. The whole district, both north and south of the Peace River, was covered.

In all, 1,717 cattle were treated this past spring for warble-fly and 11,647 warbles were reported found in the animals. It would appear from these treatments that where there is bush range the fly does not work on the cattle nearly as much as where cattle have a certain amount of open country to range in. If this treatment could be made compulsory it would be much better, as it is hard to get the second and third reports from the farmers as it comes in their busy season of seeding.

Three agricultural fairs were held in the district during the month of August—namely, Kiskatinaw at Sunset Prairie, Groundbirch, and North Pine. It was decided to hold a joint agriculture and seed fair in Dawson Creek this year; which was held October 29th. At Doe River a school fair was held in August. All these fairs were very successful and are growing from year to year, the Kiskatinaw and Dawson Creek fairs being the outstanding ones for the season. The Groundbirch fair should join up with the Kiskatinaw and make one fair west of the Cutbank River, which I am of the opinion will be done this coming year. A much keener interest was shown this year in the exhibits of seed-grain at the Dawson Creek fair, and were much better prepared than in previous years. Fourteen seed-grain exhibits were forwarded to the Vancouver Seed and Root Show and received eleven awards.

Nine garden competitions were held throughout the district this year—some adult and some junior. Much interest was taken in these, and in some districts the junior gardens were better than the adults.

A Horticultural Society has been formed in the district and last August a flower show was held in Dawson Creek. It was very successful and the first of its kind ever to be held in this district. For the coming season this society is affiliating with the Beaverlodge and Grande Prairie Horticultural Societies.

An official of the Beaverlodge Experimental Station very kindly came up and assisted in judging the two standing-crop competitions held at Progress and Groundbirch. These competitions were appreciated by the two districts.

Two very successful field-days were held—one at Beaverlodge, which was very well attended by approximately 200 visitors, and the other at Baldonnel with about 100 visitors. Much interest was shown at these two field-days.

Four Boys' and Girls' Clubs were organized for 1938—two beef calf clubs, one swine club, and one potato club. These clubs were far better than last year. The calves and pigs were more even and were finished better and more real interest taken.

From January 1st to date the live stock shipped by the Dawson Creek Co-operative Shipping Association was as follows:—

	No.	Value.
Sheep and lambs	476	$2,104.12
Cattle and calves	1,836	44,318.16
Hogs	5,790	95,676.75
Total		$142,099.03

From July 15th to date the following live stock was shipped by a private buyer: 12 sheep, 368 hogs, 3,159 cattle and calves; total value, $52,484.80.

There were 3,220 more cattle shipped out of this district this year than in 1937, owing no doubt to the dry season and the shortage of feed for the present winter. Over 1,000 less hogs were shipped this year on account of the farmers not having as much grain carried

over from last season. Practically all the sheep were taken locally, only 488 being sent to Edmonton. However, this industry is increasing considerably from year to year.

There has been much interest taken in the tests from the Field-crop Union this year, but owing to the dry season the results were not what they should have been.

Reports of the threshermen as completed to date, show the following amounts of grains threshed in this district during 1938. Several reports are not yet to hand.

Spring wheat (bu.)	343,722
Winter wheat (bu.)	1,416
Oats (bu.)	210,199
Barley (bu.)	18,323
Rye (bu.)	399
Alfalfa (lb.)	1,800
Sweet clover (lb.)	500

There were in the neighbourhood of seventy threshing-machines operating in the Block during the threshing season of 1938.

Better co-operation from farmers this year than ever before was established for the control of weeds. Several new small patches of sow thistle were found and controlled. The Weed Inspectors have done fine work. It would be better for the district if the Weed Inspectors' time could be extended until the threshing is completed.

The Farmers' Institutes throughout the Block have done much to assist in establishing fairs, Boys' and Girls' Clubs, Horticultural Societies, and Horse-breeding Associations. The annual convention was held at Rose Prairie, with several good resolutions from various parts of the district. The Women's Institute held their convention at Kilkerran, with a very fine representative gathering. The Women's Institutes have done very fine work, encouraging handicraft and supporting the local fairs.

The spring and summer this year have been very dry causing a poor harvest, and in most districts a shortness of feed for the winter; but the weather continues fine and mild with very little snow, helping the situation considerably. Water for stock is a serious problem in some districts owing to dry season and lack of snow.

The weather conditions during the harvest and threshing season were ideal and all crops harvested in good condition. A considerable amount of summer-fallow and fall-ploughing has been done ready for the coming spring. The land did not freeze-up until the beginning of November.

During the year I have visited and spoken to practically every institute meeting throughout the Block and in several instances have shown the motion pictures. The meetings were all well attended and the pictures much appreciated by the residents; the machine was a great help in the lectures.

SHUSWAP, REVELSTOKE, AND EAST KOOTENAY.

H. E. Waby, Salmon Arm.

Farm commodities have reflected slightly better prices and conditions generally are no worse than previous years. Hay is in fair demand at an increased price over last year, but the average crop somewhat light. The growing of peas in Salmon Arm and North Okanagan still continues to be a satisfactory venture, bringing a ready cash crop at fair prices.

Weather Conditions.

Weather conditions in the spring of 1938 appeared to be quite satisfactory; crops going in well with enough moisture to give them a good start, although late frosts in May took a fairly heavy toll from farmers who seeded barley earlier than usual; even oat-seedings were damaged in some parts. Pastures started off well, and owing to the fact that there was little or no run-off of the spring thaw, there being no frost in the ground, good pastures and crops were anticipated. Unfortunately, however, a long dry growing season transpired and crops of all kinds were consequently much lighter than would otherwise have been the case. Farms, however, that have been well manured and where crop-rotations have been practised held up well and produced fair average crops. Many farms, by this extremely long dry spell, showed a need of more organic matter in the soil. Frosts held off well in the

fall and roots and all crops of a tender nature were harvested in good shape. In the East Kootenay District, however, rain was unusually abundant and crops exceptionally well started.

Hay and Grain Crops.

First and second alfalfa cuttings were lighter than usual, but good third crops were harvested—in some instances for the first time, no doubt owing to mild fall weather and rain at the time needed to start them. Grain-crops were harvested well and yields about normal. Threshing was finished in good time, with weather conditions ideal for the purpose.

Live-stock Data.

Dairy Cattle.—Little change is to be noted in numbers of dairy cattle and the Salmon Arm creamery shows a decrease of over 26,000 lb. of butter-fat over 1937. This, however, can be partly attributed to extreme dry weather conditions and also to several shippers changing over to the Armstrong cheese-factory. Mineral mixtures and concentrates are receiving more attention each year, with a resulting noticeable reduction in sterility and milk fever, etc.

Horses.—Farm horses were in fair demand and few offerings to fill it. Several lots of farm chunks brought in from the Prairie Provinces found a ready market at fair prices. An improvement is shown in numbers of colts born and we look for the shortage in horses to be taken up before long by young horses that are now coming on. Several instances of weed poisoning were reported during the winter of 1937–38 but mortality low.

Beef Cattle.—A decided decrease is to be noted in the raising of beef cattle; prices having been very disappointing in the Salmon Arm and Revelstoke Districts. Increases are, however, reported in parts of the East Kootenay and good bulls are still in demand.

Swine.—Hog prices were well maintained and considerable improvement can be pointed to, both in quality and numbers kept. Good sows have been retained and an increase in numbers in the Revelstoke and Arrowhead Districts should allow of a surplus being shipped out in car-lots if a more co-operative spirit among the breeders could be obtained. Car-lot shipments from both Salmon Arm and Enderby have increased over former years and quality of hogs improved.

Sheep.—Little or no increase is to be noted in sheep flocks, except in the Columbia Valley, where quality is steadily improving. We are, however, sorry to report that Farmers' Institute Co-operative car-lot shipments from this district were not as satisfactory as in former years; prices received at Vancouver were disappointing as compared to former years.

Poultry.—Farm flocks are being maintained and improvements noted in quality of stock and housing conditions. Feeding methods are much improved and prices for eggs in the past season proved very satisfactory to those paying close attention to their flocks, especially where a fair knowledge of feeds and care were shown to be in evidence. There is still, however, a lot of ignorance and lack of knowledge shown in the handling of farm flocks. Fowl paralysis was still in evidence and more calls than usual were answered for advice on various poultry troubles. One outbreak of Favus was found. Several new flocks of turkeys were started with varied success.

Warble-fly Control.

Some 2,000 head of cattle were again treated in the spring of 1938 in the Mara, Grindrod, Enderby to Salmon Arm Districts, and this district showed an almost total clean-up. Deep Creek is still free of this pest, with the exception of two herds which were brought to the district in 1937. These herds were treated and cleaned up. A fresh outbreak was found in Salmon Arm among herds that had no warbles for several years, and we are of the opinion that it was spread from the close proximity of the slaughter-house to these herds, and warble-infested cattle being brought in for slaughter. The Grindrod-Enderby Districts can now be turned over to the farmers and only an annual check-up made. Windermere reported a decrease in warbles found and farmers co-operating well.

Rodent-control.

As usual considerable Cyanogas was used for gopher and ground-hog control and the clean-up has been remarkable, but trouble has been reported from pocket gophers and the writer has advised the use of the large poison-bait formula as recommended by our Department.

This poison-bait has given splendid results, several farmers from Notch Hill, White Creek Valley, and Carlin reporting it the best medium of control yet used. In previous reports, from close observation and from discussions with farmers in various part of the district, a closed season on badgers as a medium of gopher-eradication has been suggested. In the summer of 1938 a still closer check-up was made and more farmers found who are doing everything possible to protect the badger, having seen the value of this protection by observing the valuable work done. One farmer reported that when his son caught a badger in a trap he immediately ordered him to release it.

A number of fields which were badly infested with gophers in one year were practically cleaned up by what appeared to be only one badger. Many farmers will receive with a great deal of satisfaction the information that a close season by legislation has been placed on this animal.

Range-land Seeding.

In the East Kootenays grasses sown in 1937 were inspected in June of this year and good results were shown in a number of instances. Owing to the dry season of 1937, germination appears to have been slow, but a number of seedings gave excellent results. Parkland Brome showed about the same rate of growth as the Crested Wheat but appeared in most instances to have a more vigorous plant. Both these grasses were as high as 16 inches on high, dry benches, but it is too soon yet to know results of this work; naturally most seedings will have little opportunity to make a noticeable growth, especially as the ground was very dry at the time of seeding. However, some exceptionally fine stands of both these grasses were seen on land that had been previously cultivated.

Weed-control.

Several tests were again made with sodium chlorate for the eradication of couch-grass. Observation of these plots in the spring of 1938 showed that again good results were obtained, but results were not quite as good as those of 1934–35 from material imported from Europe. A number of tests are now under way to compare the efficiency of European and Canadian manufactured sodium chlorate. These plots are side by side and should furnish valuable information.

BOUNDARY DISTRICT.

G. L. Landon, B.S.A., Grand Forks.

The winter of 1937–38 was fairly mild with some cold weather after the New Year. The season was fairly late, followed by an extremely dry summer with continued high temperatures. The season was good for the maturing of most crops and the quality of the hay and grain crops was good.

Crops were fairly good but below average owing to the extreme heat in July and August. Acreages of the principal crops in the Grand Forks valley were as follows: Alfalfa, 764 acres; potatoes, 205 acres; onions, 59 acres; grain-crops, 1,192 acres; and vegetable-seeds, 54 acres.

The hay-crop was fairly good and indications are that the stockmen will have some hay left over when the spring opens up.

The small-fruit and tree-fruit crops were good, although the yields were below the 1937 crops. The figures for 1938 are not available as yet, but the final estimate was for 57,000 boxes of apples, and good average yields of pears and prunes.

There was a large increase in the number of barrels of small fruits processed for the British market, some 80 tons being processed in 1938. Processing is providing an outlet for a considerable volume of small fruit from the Grand Forks District.

Insect Pests.

A severe outbreak of grasshoppers occurred in the Midway and Kettle Valley Districts and up the North Fork of the Granby River District. They did not cause nearly as much damage in the Midway District owing to the fact that this area was constituted a Grasshopper-control Area under the "Grasshopper-control Act," and the committee in charge was ready for them in 1938. Approximately 37,000 acres are included in the zone area.

After such a widespread outbreak of Colorado potato-beetles in 1937 it was expected that a further outbreak would occur in 1938. However, apparently the control measures

adopted in 1937 were very effective. Mr. Max Ruhmann, Provincial Entomologist at Vernon, spent several weeks in the district in charge of this project and no doubt has reported on it in his annual report.

Seed Production.

There was a drop in the acreage devoted to seed production, but the crop was apparently of good quality. Data has not yet been secured as to the yields of the various seed crops.

There were nine varieties of onions grown for seed, three varieties of carrots, two of radish, one cabbage, one squash, and two of peas. These were grown by fourteen growers in the Grand Forks valley.

The outstanding development in the seed production of this district was the placing of seed contracts with nine growers by Safeway Stores, Limited, for almost 1 ton of seed. Contracts were signed for registered and certified varieties of onion, radish, squash, carrot, cabbage, and peas. The contract prices for these seeds was considerably above the prevailing prices for ordinary seed and was quite satisfactory to the growers. I have not had an opportunity to check up on the results, but understand they were very satisfactory. Repeat contracts are being placed for 1939.

Nothing special can be reported in live-stock production in the district. Two registered stallions—one Clydesdale and one Belgian—were brought into the district from the Prairies and are in service under the Dominion-Provincial premium policy.

Owing to absence from the district no experimental projects were undertaken during the year. However rodent-control work was continued during the year.

Poultry projects continue to take up most of my time as I was again in charge of the flock-approval work in the Fraser Valley from September to the end of the year. A separate report on this project has already been forwarded.

Your Agriculturist also attended the annual meeting of Poultry Science Association, held at Washington State College at Pullman, and University of Idaho at Moscow.

Boys' and Girls' Club Work.

Boys' and Girls' Club Work projects continue a major project in the district and as much time as possible is devoted to this work.

A series of agricultural motion pictures were shown at several places during the year in the district, at which collections were taken for the Boys' and Girls' Clubs Trust Fund. A separate report on these meetings is attached hereto.

One swine club with seven members was organized at Midway.

The Rock Creek potato club was organized again this year with twelve members. Judging of the plots was made by Mr. E. R. Bewell, of the Dominion Department of Agriculture, as in past years.

From reports received I believe both the swine and potato clubs were very successful.

Poultry clubs continue to attract many club members. There were ten poultry clubs, of which eight were baby chick clubs. There were 83 members in the poultry clubs made up of one White Leghorn club, three Barred Rock Clubs, three R.I. Red clubs, two New Hampshire clubs, and one Light Sussex club.

The policy of the Department in paying $1 per member towards the cost of the chicks is partly responsible for the rapid increase in the number of baby chick clubs.

Boundary District Boys' and Girls' Clubs Trust Fund.

Report for the Years 1932–38, Inclusive.

Year.	Receipts, including Balances from Previous Years.	Expenditures.	Balance on Hand at End of Year.
1932	$49.00	$46.15	$2.85
1933	40.47	28.15	12.32
1934	40.48	32.50	7.98
1935	25.33	19.15	6.18
1936	11.18	*Nil*	11.18
1937	11.18	*Nil*	11.18
1938	39.62	9.40	30.22

GENERAL.

Four newspaper articles were published during the year as follows: "The Turkhen—A Fallacy," published in Canadian Poultry Review; "Cyanogas for Rodent-control," published in Country Life in B.C.; "British Columbia's Poultry Outlook," published in the Family Herald and Weekly Star; "The Kootenay Poultry Situation," published in the Nelson Daily News and Grand Forks Gazette.

REPORT OF THE LIVE STOCK BRANCH.

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

LIVE-STOCK CONDITIONS.

Beef cattlemen generally did not have as good a year as in 1937, due to some extent to the dropping-off in the demand for cattle from the United States. Prices, however, remained quite steady, with cows and bulls selling rather high. Feed-lot cattle did not make money for feeders this spring. Feeders were too anxious to buy in the fall of 1937 and paid too much for their stockers and feeders, and, as a result, had to sell at a loss or at a very narrow margin.

Cattle marketings for 1938 were very high, due perhaps to some uncertainty in the minds of cattlemen regarding the future. While the unloading of a lot of cattle will help some of our overgrazed ranges, this move has not proved a very wise one since feeder cattle this fall were very scarce and the demand keen, especially on the Prairies where there is plenty of grain for finishing and a scarcity of cattle. A lot of cattle left the range for market in this rush that were entirely underfleshed; in fact, the range this year being poorer, fewer cattle should have gone to market than in 1937.

An interesting experiment in the way of a feeder and bull sale was tried in conjunction with the annual fat-stock show and sale under the auspices of the Cariboo Live Stock and Fair Association. A detailed report of this event appears in the report of Mr. G. A. Luyat, District Agriculturist, Williams Lake. A few interesting lights on this event are worthy of mention, however; a few angles which the management and contributors no doubt will take into account in future years.

The fat-stock show held on the first day saw prices somewhat disappointing, while the feeder sale the next day was most encouraging. There may be several reasons for this, but certainly there are contributors who are not capable of properly classifying their cattle, since many cattle offered at the fat-stock sale should have been entered the next day in the feeder sale. It might be well for the management of the show to discuss the sale some time previously with the packers and other buyers, in order that the market is not oversupplied at the time that they stage their sale.

The stockmen of the Cariboo showed very definitely that they are prepared to support a bull sale. Prices were most encouraging. The class of bull most favoured, however, was a good, strong, rugged bull of fair quality. Top bulls did not sell proportionately high. Prices obtained for Shorthorn bulls were somewhat higher than at the Kamloops Bull Sale. This no doubt can be accounted for by the fact that adjacent to the Cariboo range country is a large area where small mixed herds are kept and where Shorthorn breeding is favoured.

The bull sale showed the need for the establishment of a few good pure-bred herds in the Cariboo. It also showed that if several such herds were established ranchers could rotate in their purchases from one herd to the other so as to avoid too close breeding in their herds. One of our very good pure-bred breeders was forced as a result to take unduly low prices for his bulls.

Calf crops over the entire range area of the Province might be said to have been about normal. Some areas where the range is going down report a slight decrease.

Lamb crops were quite up to normal over the range and on the farms of the Province.

Car-lot shipments, straight and mixed, from Central British Columbia showed an increase, perhaps due, in part, to the feed shortage which necessitated a closer culling of herds. Seventy-two cars of stock went to Vancouver and thirty-four to Prince Rupert from this territory. Of this total eighteen cars went from Vanderhoof to Vancouver, and from

Burns Lake fifteen went to Vancouver and thirteen to Prince Rupert. It is interesting to note that twenty-seven hogs were included in one shipment from the Prince George district.

Dairying continues to advance steadily in Central British Columbia. Mr. Travis, District Agriculturist, Prince George, reports a healthy progress but somewhat disappointing prices. This would seem to be due, in part at least, to the seasonal nature of the production in that district which comes in line with peak production throughout the Dominion. A new creamery which is being established at Telkwa should help build up the industry locally.

We have had to secure information regarding the sheep industry this year entirely through our district offices and by personal contact, since the British Columbia Sheep-breeders' Association office makes no attempt whatsoever to work with this office. In the past we were always kept well advised regarding the activities of the Association, and as a result when problems affecting the industry came up we were able to go to work immediately in co-operation with the official representative body of the sheepmen. It would stand some development in parts of the Province if the coyote problem could be controlled. On the Islands and in the farming sections the dog question still continues to be a menace.

The field of swine production looks perhaps better than it has for some years, with more people becoming interested in this branch of the live-stock industry. Farmers are gradually coming to realize that if they are going to farm successfully they must get away from specialized single-line farming.

RANGE AND FEED CONDITIONS.

This year has been a most unusual one. Very few sections could be said to have had a normal summer season. In sections of the Kootenays, for instance, the summer moisture was much above average. On the whole, however, nearly all sections of the Province experienced a dry summer and, as a result, the feed-supply will not be up to volume. The level of water reservoirs as lakes and sloughs was lowered this year. The quality of the range was not high since the dry season lowered its nutritional value and, as a consequence, calf crops may not be up to average this next spring. What may modify favourably, however, is the good autumn and open winter.

An interesting experiment is under way in the Chilcotin where a drift-fence is being erected this coming year so as to force the cattle to stay off the overgrazed range.

Quality of the cattle depends upon several factors and while breeding plays a big part and good bulls are essential, feeding, nevertheless, is of even greater importance in our range areas at least. Your Commissioner in his work with cattlemen has found very definitely that faulty nutrition lays the basis for many of the ills of the cattlemen. Steady progress is being made by this Branch in correcting much of this trouble. Another few years should bring many ranchers into line and working along a systematic programme. Generally speaking, ranchers and farmers are beginning to appreciate the part that science plays in their business and, as a result, are seeking advice from this Branch.

HORSES.

Requests for good stallions continue to come in to this office and inquiries for good breeding stock is keen.

The Federal-Provincial premium policy is of value in placing better stallions throughout the Province, especially into more remote sections where, up to the present, only the poorer class of stallion was available. Past experience over many years indicates that when horse prices came up, as they are doing at the present time, many mares were bred and with a scarcity of stallions a great many inferior stallions are used. A lot of men would keep these inferior grade stallions and in that discourage the more progressive horseman from buying a good stallion. It is interesting to note that in a survey recently this office found sixty-nine grade stallions as compared to seventy-five pure-breds, and there are definitely many other grades not included in this quick survey made. This will give some idea of the problem facing the pure-bred stallion-owners and the horsemen who try to breed a better class of horse.

The amendment to the "Horse-breeders' Registration and Lien Act," which received the approval of the last session of Parliament, should do a very very great deal to improve this situation. Under this amendment no stallion can stand for public service unless it has been enrolled with the Department of Agriculture. Horses not previously inspected by this

Department will receive an interim enrolment certificate until such time as the stallion can be given inspection, when a regular enrolment certificate will be issued. Horses rejected as not eligible for classification must be barred from service. This policy should do much to prevent the production of a lot of small and unsound nondescript horses.

It is a pleasure to report that the imported stallions which came into British Columbia during the last year or so are doing well and should help our industry.

It is difficult to obtain good pure-bred breeding stock in the draught breeds other than in Clydesdales at the present time.

Under our former enrolment policy we had fifty-two stallions enrolled. Most of the pure-breds have been inspected under the Federal-Provincial premium policy.

There are to date four registered Belgian stallions; one of which was given " A " classification, two given " B," and one rejected. There are eleven registered Percheron stallions and ten have been inspected; three of which classified " A," seven " B," and one rejected. In all there are twenty-one Clydesdales, seventeen of which have been inspected. Eight were given " A " rating, four " B," and five rejected.

There are fourteen grade stallions enrolled but, as pointed out above, there are many more grade horses throughout the Province which will have to be presented for enrolment and inspection this year.

Light-horse breeding still holds a quite prominent place in this Province. Where good, big quality animals are being produced they are bringing good money.

The first annual Kamloops Horse Sale, held during March, proved a real success and prices were very good and buyers very plainly told the breeders what they wanted. Most of the draught horses sold were Prairie entries, but this year our British Columbia breeders will likely take care of the needs of the sale.

Horsemen are becoming really alarmed at the possibility of an outbreak of Encephalomyelitis among their horses, and beginning to organize so as to co-operate in any programme which may be undertaken to control this disease.

BEEF CATTLE.

The beef-cattle industry had a very good year, but buying was not as heavy. American buyers were quite active in the southern part of the Province, including the South Okanagan and Boundary country and to a limited extent in the Kootenays. This very materially helped stockmen in these areas, especially when Canadian buyers went into the field to compete. It is hoped that the United States quotas will permit American buyers to come in each year and help these people, who have been compelled in the past to take too little money for their cattle.

Your Commissioner continued again with the regular programme of work for the improvement of the industry, giving first consideration to fundamentals which includes such important factors as nutrition, disease, and selection. The question of sires for the smaller herds placed at a distance from a source of supply continues to be a problem, but the Department's policy under the Farmers' Institutes is doing a great deal to assist these cattlemen.

Mr. George Pilmer, Recorder of Brands for the Branch, reports as follows:—

Shipments.—As shown by the attached report the number of cattle shipped again created a record, the total of 50,643 being 10,648 more than shipped in 1937. Williams Lake with 10,241 showed an increase of 2,647; Clinton district shipped 6,351, an increase of 1,649; Kamloops district shipped 7,860, an increase of 2,596; and Nicola district with 7,198 showed an increase of 1,060.

In hides there was not so much activity; the total shipped being 27,023, which was 5,295 less than in 1937. At the same time the number of hide-dealers licensed dropped from eighty to fifty-nine.

Inspection Service.—A new part-time inspector was appointed at Pavilion, Mr. C. G. Bryson; and Mr. C. J. Kettyle was appointed at Endako in place of Mr. C. J. LeDuke, resigned.

As usual the inspection at all except the larger shipping-points was carried out by the Provincial Police officers, to whom the Department is indebted for much valuable work as well as for investigations of many kinds where required.

On the Cariboo Highway, owing to the change of the toll-gate from Alexandra Bridge to Hope and a subsequent reduction in number of police at Alexandra Bridge, it has not been possible for police to give the same efficient checking of traffic on the highway as heretofore.

Prosecutions.—Convictions were as follows:—Branding with unregistered brand: Two, at Merritt and Redstone. Trucking cattle without inspection: One, at Chase. Moving stock without giving notice: Two, at Kamloops and Bridge River. Shipping beef without Form 4: Four, at Penticton (2) and Summerland (2). Peddling beef without a licence: One, at Castlegar.

Legislation and Meetings.—Meetings of the Brand Commissioners and stockmen were held at Kamloops on March 21st (Directors' meeting of the Beef Cattle Growers' Association) and at Clinton on May 19th (general meeting of the Beef Cattle Growers' Association). As a result amendments to the "Stock-brands Act" were introduced and passed, with slight changes, at the 1938 session of the Legislative Assembly. The amendments provided for licensing of people slaughtering horses for animal food; licensing of dealers in horses and cattle; reduction in brand renewal and brand inspection fees; and for minor changes, all of which should ensure more efficient working of the Act for protection of the stockmen's interests.

Registrations, etc.—The number of brands recorded, renewed, etc., during 1938 was as follows:—

	Recorded.	Renewed.	Reissued.	Transferred.	Total.
Cattle brands	169	419	86	19	693
Horse brands	89	242	40	7	378
Totals	258	661	126	26	1,071

The number of licences issued was: Hide-dealers, 59; slaughter-house, 45; beef-peddlers, 11.

Cattle and Hide Shipments, 1938.

	Cattle.	Hides.
Cariboo—		
Williams Lake	10,241	602
Lac la Hache, Soda Creek, Quesnel	2,040	1,056
Clinton, Lone Butte, 100-Mile House, Lillooet	6,351	724
Totals	18,632	2,382
Kamloops, Nicola, etc.—		
Kamloops, Chase	7,860	3,081
Nicola	7,198	1,090
Ashcroft, Lytton	2,697	598
Salmon Arm	809	1,236
Totals	18,564	6,005
Similkameen—		
Princeton	335	558
Coalmont	23	368
Keremeos, Hedley	486	542
Oliver	1,495	1,137
Totals	2,339	2,605
Central British Columbia—		
Prince George, Vanderhoof	1,212	655
Smithers, Telkwa, etc.	979	457
Burns Lake	1,148	67
Totals	3,339	1,179

Cattle and Hide Shipments, 1938—Continued.

	Cattle.	Hides.
Okanagan—		
Vernon, Lumby	1,394	3,111
Armstrong, Enderby	556	604
Kelowna	180	2,588
Penticton	233	951
Totals	2,363	7,254
South-east British Columbia—		
Grand Forks, Greenwood	442	913
Nelson, Creston, etc.	83	3,128
Cranbrook, Fernie, etc.	162	1,917
Invermere, Golden, etc.	187	1,241
Totals	874	7,199
Peace River—		
Pouce Coupe, Fort St. John, Dawson Creek, Rolla	4,532	399
Totals	4,532	399

Totals compared.

District.	1938.		1937.		1936.	
	Cattle.	Hides.	Cattle.	Hides.	Cattle.	Hides.
Cariboo and South	18,632	2,382	14,785	3,294	11,592	2,757
Kamloops and Nicola	18,564	6,005	13,651	6,893	9,799	5,620
Okanagan and Similkameen	4,702	9,859	3,413	8,707	2,369	8,634
South-east British Columbia	874	7,199	2,301	8,885	652	6,461
Central British Columbia and Peace River	7,871	1,578	5,845	4,539	3,567	1,449
Grand totals	50,643	27,023	39,995	32,318	27,979	24,921

DAIRY CATTLE.

This branch of the live-stock industry had quite a good year, but the Vancouver milk market still continues somewhat disturbed and dairymen feel just a little uncertain at times. Dairying, one of the most important agricultural activities in the country, has been concentrated about the mixed farming areas adjacent to the larger cities of Victoria, Vancouver, and New Westminster, and, of course, the Okanagan Valley. The last year, however, has seen some very definite developments in centres outside these special dairy districts. The industry has gone forward very definitely in Central British Columbia with the establishment of a creamery at Telkwa.

The market for dairy cattle in the United States and the Orient still continues to be a worth while outlet for surplus cattle. These markets have very definite requirements which have to be recognized and these requirements are being recognized, but what the final effect upon our own industry is going to be is a question. Up to the present there has been no move made to lay down any clear-cut long-distance policy intended to improve the industry and advance the interests of all the groups affected.

SHEEP.

Vancouver lamb prices were fair for the year, averaging about $7 in January and February, with an average of over $8 for March, April, and May. June saw prices up to $11 for No. 1 lamb and ending the month for top lamb at $9, No. 2 lamb bringing about $1 less. July began with No. 1 lamb $8.25, going up 50 cents in the middle of the month to remain at this level until the end of the month. August opened with prices $7.50 for choice No. 1 lamb, remaining at that level on through September until the middle of October, when prices dropped to $7.25 and remained at that range until the last week of October, when they went

to $6.75. The last week of November prices started up, reaching $7.25 for that week and $7.50 by the first week of December. By December 17th No. 1 lamb was $8.25. Vancouver prices averaged about $1 over Calgary prices.

Predatory animals continue to hold back the industry, especially in the Cariboo. This situation will not improve until these animals are reduced and until sheepmen organize to throw their flocks into large bands with herders constantly in charge.

The industry is working in very well with the fruit industry in the Okanagan, where sheep in the orchards in the fall clean up the cover-crops and weeds and turn them into a form of fertilizer more acceptable to the trees. A problem facing sheepmen running flocks in the orchards is the question of arsenical-poisoning, but a suggestion made by your Commissioner a few years ago—namely, the use of abundant mineral—seems to not only help greatly but it has largely solved the problem of sheep injuring trees by eating the bark.

Sheep-killing by dogs is still a problem, especially adjacent to towns and Indian reserves. In the year there were 227 sheep killed with compensations paid amounting to $1,613.25, compared to 219 sheep in 1937 valued at $1,400. In 1938 there were 358 poultry killed, for which $299.65 was paid; while in 1937 some 178 birds were killed valued at $236.70. Only three goats were killed valued at $19, while in 1937 eight goats valued at $174.50 were killed. Total compensation amounted to $1,931.90 for 1938 as compared to $1,711.60 for 1937.

SWINE.

Hog prices were very good during 1938. During January butcher hogs brought $7.25 to $7.60 in Calgary and Vancouver about 75 cents higher. February saw prices up to $8.35 in Calgary and about $9 in Vancouver. Prices continued upward in March to over $9 in Calgary and about $10 in Vancouver. Prices held about level through April and May, hitting $10.35 to $11 the latter part of June in Vancouver. By July 10th prices had reached $11.40 and by July 15th $12. By July 29th the peak was reached in Vancouver at $12.25. Prices became uncertain in early August, going down to $9.80 in Vancouver; but by August 20th prices were up to $10.25 and by August back to $10, falling again to $9.50 the first week of September. This price held through the month. October 1st saw prices $9 to $9.25 and by October 12th they had gone down to $8. October 20th saw Vancouver prices at $7.50 to $7.75, and the end of the month $7.50. The first week of November showed a rise in price to $8.10 and by November 25th prices reached $8.25, which held till December 10th when prices went from $8.25 to $8.50. This price obtained till the end of the year.

Feeder hogs were very scarce throughout the entire year, Prairie feeders at times not being procurable. Everything indicates a definite increase in swine production on the Prairies and as a result lower prices may be expected later in 1939. Surplus feeder hogs will again be dumped on our market.

If our swine industry could receive the attention which it warrants, British Columbia could very soon take a large part of this profitable feeder market from Prairie producers. In spite of their cheaper grain-supply they have to ship a longer distance to get into our Vancouver market, and our hog feeders definitely prefer British Columbia feeder hogs since the percentage of loss in the plants is very definitely lower.

Some good work was done in the Branch this year with the added assistance of Mr. G. L. Landon, whose services were available for carrying out a preliminary survey in the Fraser Valley. It is hoped that this work can be continued this year.

Work done in the Revelstoke-Sidmouth area with the able help of Mr. H. E. Waby, District Agriculturist, has after two years' effort resulted in very satisfactory results. This district like many others in the Province up until this year had to depend upon a very uncertain local market to take care of the production, and as a result production never reached any volume. The farmers are so pleased with the boars we selected for them and with the results in general that we now have a strong demand for better breeding stock. It is hoped that two or three more centres may be developed this year. In some cases we may be able to use the Federal Brood Sow policy to get established.

NUTRITION AND ANIMAL HEALTH.

If it were possible to properly nourish the live stock of this country at all times of the year and throughout their entire lives, even prenatally, the losses from disease and disease-

like conditions would be very materially reduced. It may be said that no real progress can be made in the control of many of our present-day diseases until these fundamental modifying factors are dealt with.

In our range country better practices are being followed with a marked improvement in our cattle and sheep production. Where deficiencies in mineral are being even partially corrected by the supplying of these to the stock a distinct improvement is noted. The Meldrum Creek experiment commenced in the winter of 1935–36 continues to give the very good results in better calf crop, stronger calves, a great reduction in the number of difficult calvings in young heifers. Calf crops also do not extend over so long a period. A very definite reduction is shown in the number of so-called hospital cases in the herd. The number of knock-heel cases due to the eating of timber milk-vetch (*Astragalus campestris*) has been very greatly reduced. Cattle running on timber range where the grass is thought to be very weak and of poor feeding value are doing very well indeed. In fact, the report on the experiment shows that cattle put on flesh and are in good bloom by June, where ordinarily they showed little improvement at that date and quite a number were very definitely hospital cases.

A gradually increasing number of ranchers are using mineral on their cattle on the advice of your Commissioner, and are reporting very marked improvement.

Warble-fly eradication is being extended considerably this year to take in a portion of the Gang Ranch herd, and another large area is being undertaken in the ranch country extending from Kamloops up the North Thompson, perhaps to connect with an area already established at Louis Creek.

Last year pinkeye (*Keratitis*) made its appearance in several places in the range country, and a suggestion was made that condensed milk be given in 30 c.c. doses subcutaneously supported where possible with a keratitis bacterin.

The same practical control that worked so successfully on cattle lice was suggested as a control for the Northern poultry-mite with equally good results.

Test-work continued again this year on control of the two ticks—namely, the winter tick (*Dermacentor albipictus*) and the wood-tick (*Dermacentor andersonii*). The former tick is quite bad on horses in some portions of the Province and was being spread by means of traffic in horses to new districts. The first work done on tick-control in 1934 gave such good results with the winter tick that it was decided to try a similar control of standardized Derris powder for the wood-tick, and each year since very encouraging reports have been received from the tests. The life-history of the *albipictus* being quite simple control becomes quite easy. In the case of the *Dermacentor andersonii*, with its complicated life-history, all we can hope for is that with this treatment cattle and sheep men may go ahead and use ranges known to be dangerous with the assurance that they may expect little or no paralysis. Work to date indicates that if this powder can be well brushed into the roots of the hair of the animals over the head, neck, shoulders, and back it will penetrate to the skin and make a repellant coating that ticks will not come on to the animals, or at least if they do they do not seem to remain. Cattle should be treated prior to the tick season and before they are placed on the affected ranges. To date one treatment has appeared to be sufficient to carry animals through the danger season. This may be just long enough to carry them until they utilize these early ranges and are ready to be moved to the summer ranges where there are no ticks.

One or two reports have been furnished where co-operators claim that the powder would actually kill all ticks no matter how firmly attached and regardless of their stage of development, even the engorged females.

Little difficulties were encountered, such as in the application with heavy-coated cattle it was a little difficult to get the powder into the hair, but once it was worked in it formed a very complete and firm coat. In the case of sheep in full fleece it was also difficult, but since most flocks are being sheared earlier at present there should be no trouble in applying the product.

This method of control has been given publicity and has been called to the attention of workers charged with the responsibility of undertaking such experimental work. Further tests are being made this year at the request of stockmen who are anxious to find some control which will enable them to use certain badly-infested ranges.

Up until recently it was felt that a particular trouble affecting mostly calves during the winter time where they developed intense bloody diarrhœa, frequently associated with protusion of the rectum and fits, was due largely to the so-called infection of coccidiosis, but

examinations made during the last few years in the field supported by a few simple laboratory checks would seem to indicate that there is an unknown factor contributing.

In the field of dairy cattle, breeding-diseases still continue to be the great source of trouble, and progress is being made in calf vaccination with " strain 19 " and it would seem that before an extensive programme of complete blood-testing be instituted a survey should be made of the industry and probably a combination programme developed using the blood test to eradicate the disease where the infection is slight, and where the infection is more extensive a combination of both blood-testing and calf vaccination should be adopted.

One of the greatest contributing factors to the spread of disease is the tendency on the part of cattlemen to be constantly adding to their herds. Regardless of what programme may be adopted, cattlemen will have to decide upon becoming breeders of cattle rather than dealers.

The question of artificial insemination is being given some consideration, but at the present time it would seem that there is a need for more proven sires before the idea of artificial insemination should receive great consideration. Without a doubt, before this programme can be adopted in a practical way there will have to be a sufficient number of qualified veterinary practitioners to take care of the necessary field-work.

In the field of equine encephalomyelitis your Commissioner took charge of a programme of control last year where the disease broke out in the interior country, largely in the Kootenays, Creston Valley, and to a limited extent in the South Okanagan. Very excellent co-operation was received from the industry and by stopping the movement of live stock and carrying out a certain amount of vaccination the outbreak did not become extensive.

This year a programme of vaccination is being encouraged in the hopes that the infection will not develop as a permanent infection in the Province. An embargo has been placed on outside horses. It has not definitely been proven whether or not horses may be considered as carriers, but observations made in part of our Province would indicate that there is some carrier which comes along with the animals coming out of infected areas, and until this point is cleared up the necessity for an embargo seems reasonable.

WARBLE-FLY CONTROL.

Warble-fly work no longer continues to be a programme requiring any salesmanship on the part of this Branch. The problem now is to find the time to undertake all the work required. During the year the work extended to several new areas, including sections of the Fraser Valley and some outlying points throughout the Province.

APPENDICES.

APPENDIX No. 1.

SUMMARY OF IMPORTATIONS OF FEED-GRAINS AND MILLED FEEDS UNDER PROVISIONS OF TARIFF 145.

Month.	WHEAT.		OATS.		BARLEY.		MIXED GRAIN.		SCREENINGS.		MILLED FEEDS.		Total Certificates issued.	Cancelled.
	Tons.	Lb.	Tons.	Lb.	Tons.	Lb.	Tons.	Lb.	Tons.	Lb.	Tons.	Lb.		
January	2,381	1,990	665	990	604	680	.....	.....	85	.....	.....	.....	94	2
February	1,004	940	960	690	461	1,404	30	.....	60	.....	.....	.....	58	....
March	1,426	1,570	709	170	270	1,850	92	1,100	.....	.....	.....	.....	64	....
April	1,188	1,760	508	1,710	318	1,370	103	.....	.....	.....	.....	.....	53	1
May	2,086	500	581	470	314	390	.....	.....	.....	.....	.....	.....	72	1
June	1,164	60	421	1,404	150	1,090	106	10	12	1,900	.....	.....	50	....
July	1,384	1,130	685	938	492	500	85	160	.....	.....	149	250	76	....
August	869	630	219	660	319	1,075	60	.....	.....	.....	137	250	52	....
September	2,044	650	63	1,540	385	1,638	.....	.....	.....	.....	441	50	79	....
October	4,354	1,540	259	430	679	1,300	29	1,750	26	350	496	500	142	1
November	2,589	1,880	91	340	492	1,810	40	.....	25	.....	378	.....	110	1
December	4,306	365	399	1,740	758	110	80	.....	.....	.....	329	50	123	3
Totals, 1938	24,801	1,015	5,565	1,082	5,248	1,217	626	1,020	209	250	1,930	1,100	973	9
,, 1937	21,143	831	3,940	1,615	3,600	29	124	180	30	.....	.....	.....	616	....
,, 1936	28,843	653	4,552	1,714	5,592	1,398	288	520	.....	.....	.....	.....	970	....
,, 1935	31,612	1,340	6,103	570	7,070	664	574	1,720	.....	.....	.....	.....	1,186	....
,, 1934	26,339	428	2,538	14	4,383	224	.....	.....	80	100	.....	.....	866	....

APPENDIX No. 2.

EXPORTED NURSERY STOCK.

The following table gives at a glance the nursery stock exported to the countries mentioned:—

Countries.	Fruit-trees.	Small Fruits.	Orna-mentals.	Roses.	Plants.	Roots.	Bulbs.	Tree Seed.	Fir Cones.	Forest Tree Seed-lings.	Sweet-pea Seed.	Nuts.	Scions.	Value.
								Lb.	Sacks.					
Australia	2	.....	6	.....	.....	.....	973	1	.....	....	....	....	.....	$32.30
British Guiana	....	.....	.....	25	.....	.....	....	.....	.....	....	....	....	.....	6.25
British Isles	16	208	25	3	226	51	3,426	.....	.....	....	....	....	.....	234.60
British West Indies	....	.....	4	9	7	.....	.....	.....	.....	....	....	....	.....	6.50
China	....	18	.....	98	.....	24	480	.....	.....	....	....	....	.....	98.75
Denmark	....	.....	.....	.....	.....	.....	.....	34	.....	....	....	....	.....	163.75
Finland	....	.....	.....	.....	19	.....	300	46+ 9 oz.	.....	....	....	....	.....	245.52
Germany	....	.....	.....	.....	29	.....	.....	120	.....	....	....	....	.....	396.00
Holland	....	.....	100	.....	250	.....	500	10 oz.	.....	....	....	....	.....	103.30
Irish Free State	....	75	.....	.....	8	.....	.....	112	.....	....	....	....	.....	413.00
Japan	3	.....	1	.....	1	.....	.....	.....	.....	....	....	....	.....	6.50
New Zealand	....	.....	.....	.....	.....	3	2,861	40	.....	....	....	....	.....	91.14
Norway	....	.....	.....	.....	.....	.....	.....	1	.....	....	....	....	.....	3.00
Panama	....	.....	.....	.....	.....	.....	.....	.....	.....	42	....	....	.....	2.00
Sweden	....	.....	.....	.....	.....	.....	.....	13 10 oz.	.....	....	....	....	.....	52.00
U.S.A.	61	22,008	522	6,496	3,870	303+ 1 lb.	45½ qts. 220,802	4,998 14 oz.	100 3 lb.	....	67 pkt. 13 oz.	21 lb.	690	14,750.11
Total	82	22,309	658	6,631	4,410	381 +1 lb.	229,342 45½ qts.	5,367 lb. 11 oz.	100 sks. 3 lb.	42	67 pkt. 13 oz.	21 lb.	690	$16,604.72

APPENDIX No. 3.

B.C. Small-fruit and Rhubarb Acreage, 1920 to 1938.

	1920.	1922.	1924.	1926.	1928.	1930.	1932.	1934.	1936.	1938.
Strawberries	1,796	2,886	2,331	2,042	3,005	2,198	2,264	2,944	3,312	3,338
Raspberries	967	2,105	2,387	1,641	1,258	1,060	1,077	1,371	1,438	1,424
Loganberries	209	506	764	802	713	821	844	697	628	648
Blackberries	210	329	252	178	170	120	158	156	140	133
Red currants	23	42	58	34	42	22	20	36	42	36
Black currants	62	138	239	192	179	149	159	272	326	255
Gooseberries	56	85	96	68	69	60	71	112	112	57
Rhubarb	91	111	183	244	320	383	396	571	685	572
Totals	3,414	6,202	6,310	5,201	5,756	4,813	4,989	6,159	6,683	6,463

APPENDIX No. 4.

Five-year Record of Codling-moth Flight during Month of July from Twelve Traps, maintained in the same Positions during the Entire Period in the Kelowna District.

July.	1934.	1935.	1936.	1937.	1938.
1	1	1	.....	3	1
2	2	0	.....	2	8
3	1	1	.....	8	9
4	1	0	.....	0	6
5	2	2	.....	4	3
6	2	2	.....	5	4
7	1	1	.....	4	2
8	0	0	.....	4	5
9	2	2	.....	8	5
10	1	3	.....	6	20
11	3	2	.....	0	12
12	0	2	.....	3	18
13	1	0	.....	1	91
14	0	2	.....	0	114
15	0	12	.....	0	238
16	0	0	.....	0	356
17	6	0	.....	2	353
18	25	0	.....	0	493
19	75	0	.....	2	437
20	19	7	4	0	286
21	1	0	3	5	411
22	0	10	25	2	442
23	0	0	26	3	788
24	64	24	31	12	487
25	139	7	28	8	303
26	114	7	28	10	437
27	177	18	29	32	393
28	242	0	78	21	506
29	406	0	83	7	620
30	186	26	65	12	513
31	102	13	87	0	345

These traps were located as follows: 4 in Glenmore; 4 on the lower bench and 4 on the upper bench in East Kelowna.

APPENDIX No. 5.

SUMMARY OF DISTRICTS VISITED, CATTLE INSPECTED, AND PREMISES GRADED, DECEMBER 1ST, 1937, TO NOVEMBER 30TH, 1938.

District.	No. of Premises.	No. of Cattle Inspected.	Grade of Premises.			Ungraded.
			A.	B.	C.	
Vancouver Island and Gulf Islands	472	5,716	243	87	7	135
Lower Fraser Valley	2,504	41,834	155	2,234	109	6
East Kootenay	184	1,800	43	35	.....	106
West Kootenay	52	866	14	19	.....	19
Okanagan and Blue River	34	445	2	27	.....	5
Interior	70	1,214	4	58	.....	8
Cariboo and Central B.C.	93	728	7	15	6	65
Peace River Block	123	432	.....	.....	2	121
Totals	3,532	53,035	468	2,475	124	465

APPENDIX No. 6.

SUMMARY OF T.B.-TESTING, DECEMBER 1ST, 1937, TO NOVEMBER 30TH, 1938.

District.	No. of Premises.	No. of Cattle.	No. of Reactors.
Cowichan	42	474	0
Comox	15	67	0
Ladysmith	7	82	12
Langford	7	36	0
Nanaimo	55	936	6
Qualicum	2	43	0
Metchosin and Sooke	20	197	0
Saanich	187	2,622	69
Victoria	7	67	0
Squamish	26	96	1
Powell River	22	218	1
Gibsons Landing	23	63	0
Blubber Bay	4	20	0
Bowen Island	2	27	0
Buccaneer Bay	1	8	0
Read and Cortes Islands	16	36	0
Northern B.C.			
Bulkley Valley and Lakes Area	31	259	6
Nechako Valley	60	417	0
Cariboo	2	52	0
Blue River	1	13	0
Peace Block	123	432	4
Okanagan.			
Kelowna	19	176	0
Winfield	5	65	0
O.K. Mission	4	42	0
Rutland	4	53	0
O'Keefe's Siding	1	6	0
Vernon	13	48	2
O.K. Landing	1	18	0
Kootenay.			
Nelson	23	303	0
Slocan Valley	10	169	0
Salmo	8	98	0
Harrop and Procter	13	72	0
Kaslo	4	28	0
Creston	22	103	0
Carried forward	780	7,346	101

APPENDIX No. 6—*Continued.*

SUMMARY OF T.B.-TESTING, DECEMBER 1ST, 1937, TO NOVEMBER 30TH, 1938—*Continued.*

District.	No. of Premises.	No. of Cattle.	No. of Reactors.
Kootenay—Continued.			
Brought forward	780	7,346	101
Cranbrook	12	243	0
Kimberley	5	161	0
Jaffray	23	95	0
Baynes Lake	12	14	0
Waldo	15	31	0
Newgate	9	38	0
Fernie	12	152	0
Natal	11	132	0
Trail	8	231	0
Fruitvale	3	95	0
Vanetta	1	30	0
Rossland	6	80	0
Paterson	1	26	0
Grand Forks	10	57	0
Eholt	1	26	0
Greenwood	4	44	0
Rock Creek	1	4	0
Edgewood	25	120	0
Revelstoke	9	162	1
Interior.			
Kamloops	19	894	0
Knutsford	1	4	0
Barnhartvale	3	70	0
Beresford	1	13	0
Ashcroft	1	12	0
Merritt	3	44	0
Lower Nicola	1	14	0
Copper Mountain	1	34	0
Princeton	4	65	0
Hedley	3	49	0
Keremeos	1	7	0
Causton	2	5	1
Allen Grove	1	17	0
Marron Valley	4	52	0
Osoyoos	1	13	0
Oliver	2	39	0
Kaleden	1	10	0
Penticton	15	132	0
Summerland	1	19	1
Westbank	1	4	0
Notch Hill	1	13	0
Salmon Arm	7	60	0
West Summerland	2	18	0
Sicamous	1	6	0
Totals	1,025	10,681	104

APPENDIX No. 7.

GRAIN SCREENINGS TRANSACTIONS.

Month.	Consumed in British Columbia.								Export Direct from Elevator.		Total per Month all Grades.	
	No. 1 Feed.		No. 2 Feed.		Uncleaned.		Refuse.		All Grades.			
	Tons.	Lb.	Tons.	Lb.	Tons.	Lb.	Tons.	Lb.	Tons.	Lb.	Tons.	Lb.
January	1	.....	2	80	117	1,800	25	1,270	274	1,830	421	980
February	.....	.....	.....	.....	483	610	11	1,100	260	1,750	755	1,460
March	.....	500	43	.....	390	1,030	28	1,500	230	.....	692	1,030
April	.....	.....	.....	.....	175	1,890	19	800	180	.....	375	690
May	.....	.....	189	750	183	1,580	12	990	16	.....	401	1,320
June	25	.....	33	350	95	.....	11	980	60	.....	224	1,330
July	.....	.....	.....	.....	445	250	231	760	814	690	1,490	1,700
August	.....	.....	1	400	11	1,500	.....	.....	60	.....	72	1,900
September	70	.....	200	500	698	790	70	1,850	250	.....	1,289	1,140
October	.....	600	162	620	1,010	1,440	3	1,820	740	.....	1,917	480
November	31	.....	302	1,380	832	1,960	12	110	725	.....	1,903	1,450
December	30	.....	181	370	1,309	560	68	170	540	.....	2,128	1,100
Total	157	1,100	1,115	450	5,754	1,410	495	1,350	4,151	270	11,674	580

NOTE.—A total of 1,243 tons of refuse screenings accumulated from the recleaning process by merchants was exported to the United States by such merchants.

APPENDIX No. 8.

HYBRID FIELD-CORN—DRY-MATTER CONTENT AND YIELD TESTS, OKANAGAN, 1938.

Name.	District.	Variety.	Date planted.	Date cut.	Height.	Dry Matter.	Average Weight per Square Yard when cut.	Yield per Acre (Green).	Yield per Acre (Dry Matter).
					Ft. In.	Per Cent.	Lb.	Tons.	Tons.
J. Allen	Armstrong	M	May 14	Sept. 14	10 0	26.76	42	104	27
J. Allen	Armstrong	Minnesota Worthy 13	May 14	Sept. 15	8 0	28.71	35	84	24
J. Allen (Bottom-land, non-irrigated.)	Armstrong	A-2	May 14	Sept. 15	8 6	26.46	31	75	20
R. Lockhart	Armstrong	A-2	May 16	Sept. 19	8 3	25.68	27	65	17
R. Lockhart	Armstrong	M	May 16	Sept. 19	9 6	21.48	30	72	15
R. Lockhart	Armstrong	Golden Glow	May 16	Sept. 19	10 0	23.44	30	72	17
R. Lockhart (Bench land, irrigated.)	Armstrong	N.W. Dent (own Ont. seed)	May 16	Sept. 19	9 0	20.02	35	85	17
T. Fowler	Armstrong	M	May 24	Sept. 19	6 0	20.31	20	48	10
T. Fowler (Bench land, non-irrigated.)	Armstrong	A-2	May 24	Sept. 19	6 0	22.66	16	39	9
Simpson Ranch	Kelowna	E-2	May 19	Sept. 16	8 0	28.32	25	60	17
Simpson Ranch	Kelowna	A-2	May 19	Sept. 16	9 0	26.76	31	75	20
Simpson Ranch	Kelowna	M	May 19	Sept. 16	9 0	21.00	36	87	18
Simpson Ranch (Bottom-land, irrigated.)	Kelowna	Golden Glow (own seed)	May 19	Sept. 16	8 0	28.81	23	53	15

APPENDIX No. 9.

THRESHERS' REPORT, 1937.

Table showing the quantities of grain and seeds threshed in British Columbia for the year 1937, according to reports furnished to the Department of Agriculture by individual threshermen.

District.	Spring Wheat.	Winter Wheat.	Oats.	Barley	Peas.	Rye.	Miscellaneous Grains.	Legume-seed.	Grass-seed.	Mixed Grass and Clover Seeds.
	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Lb.	Lb.	Lb.
Peace River	628,031	1,383	375,798	62,917	31	1,132	12	1,798	1,034	.....
Creston and Kootenay Flats	426,647	60,000	32,683	2,160	350	.....	.....	.....	.....	.....
Fraser Valley	5,674	933	227,037	10,058	3,705	71	585	61,700	.....	.....
Cariboo	148,246	1,991	52,106	6,822	1,112	1,428	.....	.....	.....	.....
Kamloops and District	61,530	31,043	67,628	33,036	655	7,313	.....	112	.....	.....
Prince George District	17,036	4,222	149,879	7,756	556½	793	.....	158,861	.....	143,826
Boundary	43,482	4,334	16,606	4,620	.....	2,890	.....	.....	.....	.....
Bulkley Valley and Lakes District	14,294	4,567	43,336	15,310	1,251	128	27	.....	1,583,360	.....
Summerland	801	.....	1,322	.....	.....	.....	.....	.....	.....	.....
Penticton and District	321	.....	294	233	.....	.....	.....	.....	.....	.....
Vernon and District	77,355	72,521	70,701	30,821	13,672	578	.....	28,880	.....	.....
Nelson and District	3,563	645	7,189	950	105	.....	.....	.....	.....	.....
Vancouver Island	4,727	15,575	101,598	4,943	925	99	527	.....	.....	.....
Kelowna	8,342	15,733	21,530	6,882	209	.....	1,260	4,000	500	.....
Salmon Arm, Mara, and East Kootenay	8,736	2,917	47,419	14,119	8,308	1,923	.....	.....	.....	.....
Totals	1,448,785	215,864	1,215,126	200,627	30,879½	16,355	2,411	255,351	1,584,894	143,826

APPENDIX No. 10.

Cow-testing Associations in British Columbia, 1938.

Name.	Instituted.	Secretary.	Supervisor.	Departmental Grant.
Bulkley Valley	Oct., 1926	W. Billeter, Smithers	A. H. R. Howell	$900.00
Chilliwack, Route 1	March, 1913	W. S. Annis, R.R. 1, Chilliwack	Wm. Rose J. J. Andrews	660.00
Chilliwack, Route 2	Nov., 1928	W. S. Annis, R.R. 1, Chilliwack	J. E. Manning	660.00
Chilliwack, Route 3	April, 1927	W. S. Annis, R.R. 1, Chilliwack	J. E. Wingrove	660.00
Chilliwack, Route 4	April, 1938	W. S. Annis, R.R. 1, Chilliwack	H. C. Clark	425.00
Comox Valley	April, 1914	W. E. Mantle, Sandwick	Leslie McKinnon	610.00
Delta	June, 1937	J. T. Oliver, New Westminster	G. W. Jess	660.00
Dewdney-Deroche	Oct., 1930	F. C. Norrish, Box 66, Dewdney	R. Macgregor H. C. Clark	640.00
Langley	June, 1914	B. J. A. Campbell, Murrayville	R. A. Wilson Wm. Rose	660.00
Matsqui	Oct., 1937	H. G. Rottluff, Matsqui	W. E. Hawthorne	660.00
Okanagan	April, 1920	J. F. Munson, Kelowna	Malcolm Gibson	580.00
Pitt Meadows-Maple Ridge	Nov., 1925	S. T. Rippington, Pitt Meadows	Wm. Hooson	660.00
Richmond-Ladner, Route 1	March, 1919	S. H. Gilmore, R.R. 2, Eburne	D. S. Heelas	660.00
Richmond-Ladner, Route 2	Nov., 1938	S. H. Gilmore, R.R. 2, Eburne	T. Crowley	90.00
Salmon Arm-North Okanagan	July, 1929	B. H. Morris, Enderby	J. H. Wood Alf. Johnson	620.00
Sumas	Nov., 1923	B. Stewart, Abbotsford	J. J. Andrews R. A. Wilson	660.00
Surrey	Nov., 1924	F. McKinnon, Box 11, Cloverdale	R. J. Weir	575.00
Vancouver Island (South)	April, 1929	R. Rendle, 1118 Johnson Street, Victoria	T. G. M. Clarke	660.00

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