

PROVINCE OF BRITISH COLUMBIA

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TWENTY-SIXTH ANNUAL REPORT

OF THE

DEPARTMENT OF AGRICULTURE

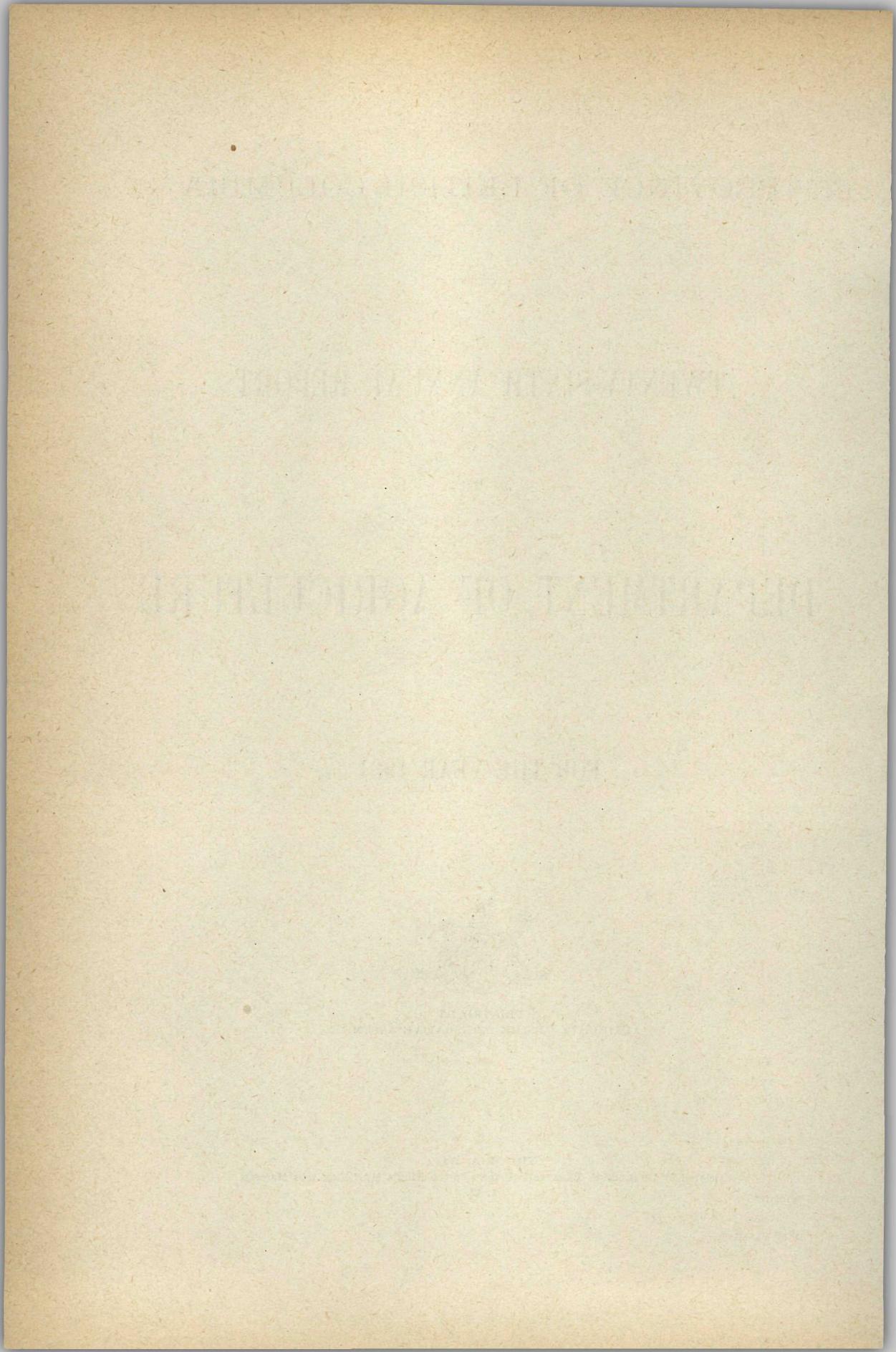
FOR THE YEAR 1931



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# REPORT OF THE DEPARTMENT OF AGRICULTURE.

DEPARTMENT OF AGRICULTURE,  
VICTORIA, B.C., February 9th, 1932.

To His Honour J. W. Fordham Johnson,  
Lieutenant-Governor of the Province of British Columbia.

SIR,—I have the honour to submit herewith the Report of the Department of Agriculture for the year 1931, in which the activities of the several branches of the Department are summarized from detailed reports prepared by officials and available for reference.

## AGRICULTURAL LEGISLATION.

Four Bills affecting agriculture were presented at the Third Session of the Seventeenth Legislative Assembly, in addition to which the "Grazing Act," introduced by the Minister of Lands, was supplemental.

In the "Stock-brands Act" a general revision of the Act has been made to regulate sales of branded cattle and hides in the range areas of the Province. Changed transportation methods by means of motor-vehicles and by highway driving have made extra precautions necessary.

The "Noxious Weeds Act" was a revision of previous legislation made necessary by changed conditions in the Province through the development of the Peace River Block. New features of the legislation are chiefly in regard to the operation of threshing-machines with a view to preventing the spread of weed-seeds.

The "Animals Act Amendment Act," which is supplementary to changes in the "Grazing Act," provides that the Lieutenant-Governor in Council shall have power to make regulations setting the type and breed of bulls permitted to run at large in prescribed areas. Power is also given to define areas in which stallions running at large may be deemed a public nuisance and may be shot by persons authorized by the Government Agent.

The "Threshers' Lien Act" gives threshers the right during threshing or at conclusion to take a sufficient quantity of grain to pay for their services at the market value of the grain at the nearest public grain-elevator or warehouse, together with the cost of hauling to such market.

Other Bills affecting agriculture were: Amendments to the "Produce Marketing Act" to give authority to the Supreme Court to appoint a liquidator to wind up the affairs of a Committee of Direction when the same ceases to function; amendments to the "Dairy Products Sales Adjustment Act" to give the Lieutenant-Governor in Council power to define additional forms of milk products which would then come under the Act.

## FARMERS' INSTITUTES.

During the year 1931 there were incorporated nine new Farmers' Institutes, bringing the total to 198 institutes, with approximately 7,400 members. Through the "Pure-bred Sire Policy" there were thirty-six pure-bred bulls, eight pure-bred rams, and four pure-bred boars supplied to Farmers' Institutes. Ploughing-matches were conducted by Farmers' Institutes in the Peace River Block, the Okanagan Valley, Fraser Valley, and on Vancouver Island, and a very successful Provincial ploughing-match was staged at Sardis, B.C., with forty-two teams competing.

Although for reasons of economy it was impossible to pay *per capita* grants to Farmers' Institutes as formerly, the services of the Department were made available to these and other farmers' organizations.

Following the lead of certain Bulkley Valley Farmers' Institutes, a number of institutes throughout the Province this year made original arrangements for the purchase of seed-grain. On finding that money for the purchase of seed-grain would not be available under the provisions of the "Seed-grain Act," members of these institutes got together, ascertained their collective requirements, and negotiated through banks or other money-lending agencies for funds with which the seed was purchased, giving security on live stock and other chattels, which was satisfactory to the bankers. In this way a number of car-loads of seed-grain was secured.

The stumping-powder rebate has this year been paid to institute members on a basis of \$2 per case up to a maximum of ten cases used by any individual member for land-clearing.

District Farmers' Institute conferences were held in the ten institute districts of the Province, but the annual meeting of the Advisory Board, usually held at Victoria, did not take place this year.

#### WOMEN'S INSTITUTES.

There are 154 Women's Institutes with 4,542 members in British Columbia, including eleven new institutes. These institutes are living up to their aim, which is to improve conditions of rural life so that settlement may be permanent and prosperous.

In response to an appeal received, three car-loads of fruits and vegetables were sent by the Women's Institutes of Nakusp, Creston, and Kaslo to the drought-stricken areas of Saskatchewan.

Girls' judging-teams were again organized and as a result of district competitions four teams competed for the Provincial championship at the Vancouver Exhibition. This championship was won for the third time by the team of girls from Armstrong, B.C.

Co-operating with the Victoria Junior Chamber of Commerce, an essay competition on "Why I should buy Canadian Products" was organized and carried on to a successful conclusion, with the result that 175 essays were entered by institute members from all parts of the Province and three prizes were awarded.

In line with the usual policy of the Institutes Branch the public-health and child-welfare work was carried on under the supervision of the Department of Health. The most outstanding work accomplished in this connection was in the "Mouth Health Campaign" of the Canadian Dental Hygiene Association. Free dental treatment was provided for children under 12 years old in several districts where no registered dentist was available.

No Provincial conference was held this year, but the nine district conferences were held at Pouce Coupe, Nelson, Salmon Arm, Kamloops, Edgewood, New Westminster, Langley Prairie, Quathiaski Cove, and Victoria, and were attended by delegates from nearly every institute.

Since the Othoa Scott Endowment Fund was started in 1929 for the purpose of raising \$10,000 to be available for all time to help two crippled country children to attain health, fifty-eight institutes have contributed \$3,612.15, which is held in the Bank of Commerce at Victoria, with Mr. Alan B. Morkill as treasurer.

#### DEMONSTRATION TRAIN.

This Department again participated with the Canadian National Railways in the operation of an agricultural demonstration train, which made calls at seventeen points in the Fraser, Thompson, and Okanagan Valleys. The demonstration material was provided and set up by this Department and speakers were made available to accompany the train throughout the course of its journey. In all, 6,000 people visited the train when it made the trip during the month of March, beginning at Chilliwack on February 28th.

#### SOIL SURVEY.

The soil survey undertaken this year was a development arising from the Sanford Evans Fruit Inquiry Report of last year, in which it was recommended that the Government should make the necessary provision for a service in the chemical, bacteriological, and physical examination of soils in the irrigated districts of the Interior. The soil-survey work was jointly undertaken by the Provincial and Dominion Departments of Agriculture. A committee was named by the two Departments. This committee decided upon the survey methods to be followed and selected the area in which work was to be done. Beginning at Peachland, where 1,506 acres were studied, mapped, and reported on, the work then extended to the Salmon Arm District, where efforts are being made to secure water for irrigation. The Salmon Arm area surveyed included 12,000 acres, of which upwards of 2,000 acres have been planted to horticultural crops.

A small section of the Wynndel District in the Kootenay Valley, where an attempt is being made to irrigate, was next undertaken and approximately 600 acres were surveyed and mapped.

At the conclusion of the year work was still in progress in the Vernon District, where approximately 10,000 acres have been surveyed. Completion of maps and reports is being carried on in the Kelowna office during the winter.

## WATER-DIVINING.

At the request of settlers in districts where water-supplies for domestic purposes were insufficient and of vital necessity to the communities, this Department engaged two water-diviners to make locations where wells might be drilled or dug with reasonable expectation of securing water. There were 249 homesteads visited and 392 locations marked by the two water-diviners in the Okanagan, Shuswap, and Thompson Valleys, in the Southern Interior; in the Cariboo, Nechako, and Bulkley Districts of the Central Interior; and in the Peace River District; also a few locations were made on Vancouver Island.

Complete reports covering these undertakings are on file and letters received from time to time indicate that settlers are securing satisfactory water-supplies where digging operations are carried on.

## APICULTURE.

Winter and spring conditions were satisfactory in most sections where bee-keeping is carried on, but wet weather in June prevented normal activities of field bees, reducing the average yield to 53.5 lb. per colony for the whole Province. In the Okanagan, Shuswap, and Thompson Districts the honey-flow was very satisfactory, giving an average yield for those sections of 74.6 lb.

It was in the Coast areas that low production reduced the Provincial average, and particularly was this the case in districts where fireweed is usually depended upon as a source of surplus honey. The blight which affected the fireweed is being studied by Plant Pathologists.

In spite of the lower average production per colony, the total estimated honey-crop for 1931 amounted to 1,144,470 lb., being slightly more than last season's crop of 1,121,325 lb. This increase is accounted for by an increase of bees. There were 342 apiaries containing 1,141 colonies of bees registered during the current year, while only fourteen certificates were cancelled.

Inspection for the purpose of controlling contagious bee-diseases was limited owing to reduced funds being available for the work. The disease situation in the Lower Mainland is serious, as would appear from the following table showing the number of colonies found affected with American or European foul-brood disease in the apiaries inspected:—

District.	Apiaries.	Colonies.	A.F.B.	E.F.B.
Chilliwack.....	141	603	58	50
Langley.....	256	1,215	152	85
Various.....	231	1,741	170	33
Totals.....	628	3,559	380	168

Badly affected colonies and the combs of others were all promptly destroyed. No compensation was paid in this connection and commercial bee-keepers are, in the majority, of the opinion that the cancellation of compensation payment has been in the interests of the industry. Out of a total of 188 smears and twelve samples of comb examined by the Apiary Inspector in New Westminster, ninety-seven were found to be affected with American foul-brood, eighty with European foul-brood, and twenty-three proved sterile. The increase in this work is probably due to curtailment of personal inspection in many districts, while an increased number of bee-keepers, recognizing that microscopic diagnosis is positive, are taking advantage of this service.

In addition to competitive displays of honey and apiary products at fairs and Provincial exhibitions, a number of honey entries were sent to the Imperial Fruit-show in Manchester, England, where in their first attempt at competition with the rest of the Empire British Columbia bee-keepers captured six out of the total of nine prizes offered.

A special report on the history of bee-keeping in British Columbia has been prepared and copies filed with the Department of Agriculture and the Provincial Library. This report indicates that the first two colonies of bees were imported to Vancouver Island from Oregon by Mr. J. D. B. Ogilvie, who established an apiary 2 miles from Victoria in the spring of 1860.

Other importations which followed are recorded in the report above referred to, which was compiled from information secured from pioneer bee-keepers and early settlers.

#### MARKETS EXTENSION.

Recognizing that the primary function of the Markets Branch is to bring willing buyers into contact with willing sellers, a consistent effort toward this end has been maintained during the year. Officials of the Markets Branch have carefully studied the credentials of both buyers and sellers seeking for trade through the Branch, so that satisfaction to both parties might be the result. Special consideration has at all times been given to the interests of the absentee shipper.

The Markets Branch has engaged in a search for new markets for surplus products while further developing markets already served. Information has been made available to shippers and growers regarding conditions in such markets, and an effort has been made to prevent demoralization of these markets through disorderly shipments that would result in gluts at certain consuming-points.

It was to accomplish this end that a Bureau of Markets Information was established at Vernon by the Department in conjunction with the Okanagan Shippers' Council. Daily reports giving data as to quantities shipped to various destinations and prevailing market conditions were given out during the marketing season. At the same time a bulletin issued three times a week from Victoria reported on market conditions in important trade centres.

British Columbia loganberry-growers have this year, for the first time, exported canned loganberries in quantity to Great Britain. The 10,000 cases or more which have been shipped overseas have found ready sale in competition with the product of other countries. As British Columbia is the only Canadian Province growing loganberries for export, particular interest is shown in this trade which gives considerable promise.

Prices on all farm products reached a low level during the current year and buying-power on the Prairie markets, upon which British Columbia producers largely depend for an outlet for fruits and vegetables, was seriously reduced. To meet the decreased buying-power British Columbia shippers quoted low prices, which helped to maintain a normal consumption in Western Canada and reduce importations from foreign countries.

The demand for necessary foodstuffs has been found fully equal to any previous year. This is largely due to protection given to the home market by the establishment of fair market values placed on foreign importations for duty purposes, which prevented the overloading of our home market with imported goods of a kind that could be grown at home; and buyers were prepared to wait for home-produced stuff rather than pay the higher prices ruling on imported goods.

The fear of the Prairie dwellers that the fair market values would increase the prices for them was not realized, as it was well understood when the fair market values were placed that if such advantages were taken the fair market values would be removed. Instead, lower prices than ever were quoted with the view of stimulating demand, and this had the whole-hearted co-operation of the Prairie jobbers, who gave their full support and preference to the purchase of home-grown produce.

While we have reached the saturating-point of some commodities for our natural Prairie markets, giving the impression that overproduction is general, there are many commodities that can be successfully grown in British Columbia that are still underproduced for the demand existing for them on the home market. We have no extensive vegetable-canneries, although a little is done in this line in the canning of peas, beans, and tomatoes; there is still a great field for this line, and a growing demand exists for all early vegetables of a kind that canneries put up.

#### BUENOS AIRES EXHIBITION.

An exhibit featuring agricultural products was sent to the British Empire Trade Exhibition at Buenos Aires, where the British Columbia exhibition apples were sold and returns made to the local shippers. The Argentine is a promising market for apples, but unfortunately it is not fully available to this Province because of an embargo effective on December 15th prohibiting the entry of apples after that date.

Particular attention has been given to market possibilities for processed, canned, and dehydrated fruits and vegetables in the Orient and other foreign lands, but it is now apparent that the British market provides a logical outlet for our surplus of agricultural commodities. While competition in the markets of the British Empire is keen, it is recognized that any preference given to Empire products is beneficial to British Columbia products.

Information regarding kinds and varieties of commodities required by the market is passed on to growers through agricultural officials and in markets news-letters sent to the press at regular intervals, as far as possible market requirements are anticipated and all visible outlets for our commodities at profitable prices are carefully investigated.

## PLANT INDUSTRY DIVISION.

### TREE-FRUTS.

While figures are not available for the 1931 production of tree-fruits, estimates show that there was a shortage as compared with the crop of the previous year. Apple production is about 1,000,000 boxes, or 20 per cent. below 1930, while pears and apricots were slightly more abundant than usual. The cherry and peach crops were short. The rain during the picking season did considerable damage to cherries in all sections and early spring frosts severely injured peach-blossoms, reducing what promised to be the heaviest production on record.

Prices were fair and in the case of apples better than was at first anticipated. The heavy shipment of bulk cars of apples has reduced the average returns, but the prices for late varieties and for export shipments have strengthened.

Stone-fruits brought better returns than in the previous year. In fact, the satisfactory prices obtained for stone-fruits this season, coupled with assistance given through increased protection in the summer of 1930, not only led to increased plantings this spring, but have encouraged orchardists to plan for further plantings in the spring of 1932. Some idea of the increase in the Okanagan Valley may be obtained from the following figures, which show a total planting in the spring of 1931 of 24,731 trees:-

	Total, 1930.	New Plantings, 1931.
	Trees.	Trees.
Peaches .....	47,157	14,872
Apricots .....	43,770	3,540
Plums and prunes.....	46,718	2,289
Cherries .....	30,686	4,024

### SMALL FRUITS.

With the favourable weather conditions that prevailed during the winter and spring months it was anticipated that the crop of small fruits would be very satisfactory. Unfortunately, however, heavy rains during the strawberry season caused a reduction in that crop. Vancouver Island, which is one of the heaviest producing areas, shipped only eight cars of strawberries as compared with sixteen the year previous and forty-eight in 1928. Like conditions prevailed in other sections of the Province. In the raspberry sections of the Lower Mainland wet weather also reduced the shipments of that crop. In the case of both of these fruits considerable quantities were processed and a large quantity is still held for sale. Loganberries in all sections were an excellent crop, the estimated yield being well over the average. Unfortunately the wineries did not take the usual quantity, with the result that while larger quantities were canned or sold to the jam-manufacturers, a considerable portion of the crop was not picked.

The principal grape-growing area is in the Kelowna District of the Okanagan Valley, where the grape-crop was again excellent. The yield and quality was all that could be desired. Although the price realized was less than last year, the grapes were all sold at a profit.

Much interest has been aroused throughout the district in the possibilities of grape-growing, and much propaganda spread as to the wonderful profits to be made out of growing grapes for wine purposes. As mentioned last year, there is every reason to say that suitable varieties of American grapes in good locations will grow exceedingly well in the Okanagan.

Little is known here about many of the earlier and hardier sorts of European grapes, and it is possible that experiments may prove some of them adaptable to this climate. Mr. Rittich, of the Belgo District, recently imported and planted some of the hardier varieties grown in Austria. These are mostly of the Chasselas group. These varieties have done reasonably well in some of the north-eastern and north-western States and may prove satisfactory here. They are being grown in the European method—close planting and low pruning, so that they can be protected in winter. This is an interesting test and is being watched closely.

## VEGETABLES.

From the standpoint of production the past season has been a most favourable one. On the other hand, returns in many cases have been unsatisfactory. In the Okanagan the tomato acreage was reduced from 4,347 acres in 1930 to 3,122 acres in 1931. Sales were slow, due to the fact that the canneries were still stocked up with last year's pack and would make no contracts. Greenhouse tomatoes were also low, although prices received were about the same as in 1930.

Onions show a slight increase in acreage, there being 1,247 acres, as against 1,093 in 1930. Prices at the beginning of the season were very low, although they have stiffened and it is anticipated that they will go higher. Unfortunately they are for the most part now out of the growers' hands.

Head-lettuce is grown principally in the Armstrong and Coast sections. There was a good demand for this crop and for the first time a car-load was shipped to Ontario. This brought good returns and will likely lead to further developments on this market.

Cantaloupes are chiefly grown in the Oliver District. This year about 100 acres came through to production. Early production is one of the principal factors in satisfactory returns for this crop, and growers who marketed an early crop did well. This is one of the important special crops and deserves all the attention that can be given it.

In all, about 100 acres were devoted to celery in the famous Armstrong celery district. The early crop moved out well. The medium and late crop, however, brought unsatisfactory returns, in some cases as low as \$20 per ton. A great deal of the late celery was pitted and present prices are more encouraging.

A fairly large acreage of asparagus has been set out in Kelowna and the area is increasing in many other sections. Spinach is also another crop which is coming to the fore in the Okanagan Valley. This year 4 to 5 acres were grown in the Vernon-Armstrong section with fair success. The coming year, however, should see quite an increase in the acreage devoted to this crop. About 10 acres have been seeded to spinach this fall by arrangement with the Bulman Canning Plant, at Vernon, and the growers. There are also further possibilities in the production of corn and beans for canneries.

The general depression and the poor grain prices ruling on the Prairies has affected the vegetable-growers in the Okanagan very materially, and the only hope of success is in the production of extra early crops or those in the off-seasons; the improvement of special crops such as cantaloupes, etc., and the development of special cannery crops wherever possible.

## ORCHARD SURVEY.

As intimated in the 1930 report, a survey of the orchard areas in the Okanagan and Kootenay Districts was computed in so far as the field-work was concerned. The compiling of the figures was completed early this year. The following table sets forth briefly a comparison of the plantings of different kinds of tree-fruits as obtained in the last three surveys made:

*Table showing Comparison of Total Number of Fruit-trees in the Okanagan and Kootenay Districts according to the Orchard Surveys of 1920, 1925, and 1930.*

	Okanagan.			Kootenay.		
	1920.	1925.	1930.	1920.	1925.	1930.
Apples.....	1,103,550	1,147,511	1,137,851	483,312	378,096	289,546
Pears.....	61,819	70,254	84,589	30,445	21,820	18,254
Plums.....	21,981	20,874	16,689			
Prunes.....	44,940	33,420	31,029	50,170	25,031	13,792
Cherries (sweet).....	23,629	28,854	30,686	21,566	22,822	30,086
Cherries (sour).....	9,091	7,152	4,571	8,196	4,942	2,784
Apricots.....	31,991	51,107	43,770	204	712	983
Peaches.....	47,378	52,425	47,157	2,189	1,505	2,142

Acreage may be computed on the basis of number of trees per acre as follows: Apples, 60; cherries, 60; pears, 70; plums, prunes, peaches, and apricots, 100.

## BULB SURVEY.

The acreage in bulbs grown in British Columbia shows an increase. The principal bulb areas are to be found on Vancouver Island and in the Lower Mainland districts. The first survey of the acreage in bulbs was made in 1929, while a second was completed this year. Details of acreage, etc., as shown by these two surveys are given in the following table:—

	Vancouver. Island.	Fraser Valley.	Remainder of Province.	Total.
1929.				
No. of growers.....	60	16	15	91
Acreage .....	75	73	12	160
1931.				
No. of growers.....	63	18	18	99
Acreage .....	83	97	20	200

## GREENHOUSE SURVEY.

A survey of the acreage devoted to glass is made every two years by officials of the Horticultural Branch. The first survey of this nature was made in 1923. The figures show that at that date there were 1,905,180 square feet or approximately 44 acres under glass in the Province. The 1931 figures show 3,948,402 square feet or approximately 90 acres devoted to greenhouse crops, an increase of over 100 per cent. in the last eight years.

## SEED PRODUCTION.

In all parts of the Province there is a noticeable increase in seed production. British Columbia offers excellent opportunities to those who are interested in this work and willing to give the necessary care and attention to the detail required. Certain sections are particularly adapted to certain seeds, and the different parts of the Province should be carefully investigated as to their suitability to the production of different seed by those who may anticipate undertaking this work. The latest figures for annual seed production here are as follows:—

	Lb.		Lb.
Beans, dwarf .....	4,060	Beet .....	375
Broccoli .....	25	Cabbage .....	100
Carrot .....	684	Cauliflower .....	15
Corn, sweet .....	3,400	Cucumber .....	175
Lettuce .....	425	Onion .....	3,790
Parsnip .....	110	Peas, garden .....	168,312
Pumpkin .....	75	Radish .....	672
Spinach .....	100	Squash .....	185
Tomato .....	75	Sweet peas .....	14,427

Other flower-seeds to the value of \$20,452 were also produced.

## PRUNING SCHOOLS AND DEMONSTRATIONS.

The usual instructional work in pruning was carried out this year. Pruning-schools were held at various points on Vancouver Island, as well as in the Lower Fraser Valley and Kootenay Districts. A total of ten schools were held with an attendance of ninety-one pupils. Pruning-schools usually cover a period of three days each, while pruning demonstrations are only half a day to one day in length. Altogether there were thirty demonstrations with an attendance of 437 pupils.

## DISEASE AND PEST-CONTROL WORK.

*Codling-moth (Cydia pomonella).*—This past season the control-work for codling-moth was discontinued in the Kamloops and Kelowna City areas. The work was, however, continued in Vernon City area as well as in the district made up of the Vernon School District and the Coldstream Municipality. These sections have been created codling-moth control areas by Order in Council and certificates and details of costs have been submitted to the Provincial Assessor

for collection. There were one or two new outbreaks of codling-moth this year and some of the older infested areas show very heavy infestation.

*Potato-beetle (Leptinotarsa decemlineata).*—The control of potato-beetle was again undertaken in the East Kootenay District with most satisfactory results. This season adult potato-beetles appeared above ground very early and the larvæ started hatching out in the Cranbrook District ten days earlier than usual, presumably on account of the very mild winter. The adults also appeared to be fairly numerous with every indication of larvæ or bugs on all potato-fields in the older infected area. This, however, did not materialize, and although there was a general sprinkling all over there were very few fields badly affected.

In the Cranbrook District, where most of the larger acreages are worked by Chinamen, control has been good. All early potatoes were dusted twice and late varieties once. Many plots and gardens have not seen beetles this year. At Newgate, Grasmere, Waldo, Dorr, and Wardner, control has been good, with less beetles than formerly. At Fernie beetles have been more numerous, a larger acreage of potatoes grown, and more poison-dust used.

At Creston the control has been only fair; all growers have a few potatoes for their own use, but pay most of their attention to their orchards, and potato-beetle control is sometimes neglected. The beetle has not got past Sirdar and last year's infestations there have been cleaned up.

In the north country all the infestations at Edgewater have been cleaned and no beetles have been seen there this year. From there to Golden no infestations have been found or reported.

No infestations have been found on the Windermere Experimental Farm, the Shuswap and the Columbia Indian Reserves, or at Windermere, Invermere, Wilmer, and Fairmont, where infestations were treated for eradication last year. A complete clean sheet for the whole of this district cannot be given, however, as on final inspection on August 26th one small infestation was found on the west side of Lake Windermere at Mr. Bavin's farm. Two hills of potatoes were found, the larvæ on which had gone to ground, pupated, and come up as adult beetles, a sufficient number of them to have caused lots of trouble for next year. Fifty-two of these adults were caught and killed, besides eight which were dug out of the ground around these two hills. The plants for  $\frac{1}{8}$  acre around have been dusted with straight calcium arsenate.

No beetles have been seen at Thunder Hill and only one infestation at Canal Flats. So that now the farthest north infestation is back at Premier Lake, in the Sheep Creek country, barring the two small infestations already mentioned.

One visit of inspection has been made in the Nelson District, where one adult beetle was found last summer south of the town, but no more have been found or reported this summer.

Abundance of beetles has decreased very considerably in all sections, that have been affected for some years, by the action of the Provincial Department in supplying free dust to growers, and no actual spread has taken place from four years ago, which, if no steps had been taken in control measures, the beetle by now might have spread to all parts of British Columbia. A constant vigilance will have to be kept on the north and west areas if the beetle is to be held in its present areas.

*Apple-scab (Venturia inaequalis).*—In order to ascertain the value of different sprays in the control of apple-scab various tests were conducted in the Salmon Arm and Vernon Districts, as well as in the Kootenay. In the Salmon Arm and Vernon District sprays were applied, the work being carried out in collaboration with the officials of the Dominion Laboratory of Plant Pathology at Summerland. All arrangements with regard to these and supervision of spray applications were supervised by departmental officials—officials of the Pathological Laboratory keeping the checks and making counts. In order that reliable and definite conclusions may be arrived at it is planned to carry on the work over a four-year period.

#### INSPECTION-WORK.

*Nursery Inspection.*—As in the past, inspection of all tree-fruits was undertaken in the various nurseries in the Province. In many cases inspection of ornamental shrubs was also carried out. Over twenty-five nurseries were inspected. In these nurseries the total number of trees inspected was 169,604, of which 2,608, or 1.5 per cent., were condemned and destroyed.

*Inspection of Protection Spraying Zones.*—At the present time there are six protection spraying zones in the Okanagan and one in the Kootenays. The following table gives the names of the areas in question and the number of growers in each:—

Name of Zone.	No. of Acres.	No. of Growers.
North Kamloops .....	248	19
Okanagan Centre .....	340	23
Winfield .....	1,024	61
Westbank .....	298	42
Kaleden .....	248	40
Keremeos .....	463	104
Robson .....	125	31
Totals.....	2,746	320

The number of sprays applied in each zone is definitely stated at the beginning of the season and the applications of these sprays as far as possible are checked by officials in charge of the district in which the zone is located. These officials also assist in the spraying-work undertaken in spraying areas formed under the "Municipal Act."

*Fire-blight (Bacillus amylovorus) Inspection.*—As in other years, inspection of the orchards for fire-blight was undertaken. In the Kootenay District this trouble is not so prevalent and a general inspection is all that is necessary. In the Okanagan Horticultural District a systematic inspection of all orchards is made, and when the work has been carried out to the satisfaction of the Inspector in charge a notice is posted intimating that such work has been done. Some idea of this work for the 1931 season may be obtained from the following table:—

*Total Inspections for the Season 1931.*

District.	Total inspected.	Inspected, reinspected, and passed.	Not passed.
Salmon Arm.....	Acres. 218	Acres. 207	Acres. 11
Vernon.....	5,249	5,127	122
Kelowna.....	4,853	4,726	127
Penticton.....	2,137	2,097	40
Summerland.....	3,199	3,199	.....
Totals.....	15,656	15,356	300

**FERTILIZER TRIAL PLOTS.**

The results obtained from the extensive programme of field trials with commercial fertilizers, commenced on a three-year basis last season, with the co-operation of some sixty-six farmers throughout the Province, were so satisfactory that this year the number of co-operators and projects was increased to ninety-two. That this substantial increase was made possible is an indication of the growing interest among our farmers in the use of commercial fertilizers.

Appreciating the fact that results obtained from these field tests for one season only could not be expected to be definitely conclusive, the experiments, as has been indicated, were undertaken on a three-year basis. It was felt that from the results obtained over such a period, from tests conducted on a great variety of soils, and on many different kinds of crops grown in districts scattered throughout the Province, valuable information should be obtained regarding the practical and profitable use of commercial fertilizers.

The fertilizers applied have been ammonium phosphate; triple superphosphate; "complete" fertilizers; and (on orchards) nitrate of soda, sulphate of ammonia, calcium nitrate, muriate of potash, and sulphate of potash. These fertilizers have been used at different rates of application in an endeavour to find out the most profitable rate to apply. In treating the orchard plots, experiments are being conducted with fall *versus* spring applications. Various methods of applying fertilizers are also being tried out. In some cases they have been broadcasted and harrowed or disked in. In others, applied with a regular fertilizer-drill, and in still other instances (with hoed crops) scattered in the furrows. On the orchard plots surface application is being tried out, as against applying the fertilizers at depth, in order to bring the material close to the feeding roots of the trees.

As many soils in the Province, and more particularly in the Fraser Valley and on Vancouver Island, are more or less acid in reaction, a series of experiments were carried on this season in

the Chilliwack District to ascertain the effects of application of lime. Plots were treated with lime alone, with lime and ammonium phosphate, and lime with a "complete" fertilizer.

Results obtained during the past two years of the experiments have emphasized the vital importance of an adequate supply of soil-moisture in determining the profitable use of commercial fertilizers. Where irrigation-water has been properly applied, or in districts where there has been a reasonable amount of timely rainfall, and the soil in both cases has been fairly well supplied with humus, results, and often striking results, have been obtained from the fertilizers applied. On the other hand, where there was little or no moisture in the soil, the check-plots in the field trials have frequently given as good as, or better crop returns, than those obtained from the fertilized plots. The natural tendency, when such disappointing results have been obtained, is for the experimenter to condemn the fertilizer. But, when substantial increases in crop returns have resulted on similar soils, well supplied with both humus and moisture, the latter instances offer *prima facie* evidence that it is not the fertilizer to which the failure to produce results can be attributed.

#### FALL-SOWN CROP COMPETITION.

In an attempt to stimulate the growing of a greater amount of succulent feed for dairy cows a forage-crop competition was inaugurated last year on Vancouver Island. A survey of some of the dairying districts of the Island confirmed the opinion that most of these districts are not growing enough green feed for cows. The special objective of this competition was to encourage the growing of such green fodder-crops as could be sown in the fall. Fall-sown fodder-crops of various mixtures of fall wheat, winter oats, peas and vetch, when grown under favourable conditions, do exceptionally well on the Island.

This year it is gratifying to be able to report that there are no less than seven Vancouver Island institutes, with fifty-eight members participating, taking part in this competition. The institutes engaged are as follows: South Saanich, Nanaimo-Cedar, Alberni, Shawnigan, Cowichan, Comox, and Coombs.

#### PLANT QUARANTINE.

The following are the most important of the many sections dealt with and will give a slight idea of the importance of that Branch in protecting the agriculture of the Province by preventing the introduction of foreign insect pests and diseases.

#### INSPECTION-WORK.

For the purpose of preventing the importation of destructive insect pests and plant-diseases all plant products were inspected on arrival in the Province.

Following the same routine as for several years past, all fruit, vegetables, rice, corn, peas and beans, etc., were inspected at points of entry into the Province where officers for that purpose were stationed. Trees, shrubs, plants, bulbs, corms, rhizomes, and roots for propagation were inspected at the Vancouver Inspection and Fumigation Station before being released to the consignee, with the exception of a certain class of stock inspected at other points in the Province by special permit.

Complying with the regulations of other countries, and incidentally protecting the reputation of our products abroad, plant products exported were carefully inspected. Provided they were apparently free from pest or disease, a certificate was issued accordingly, but no fees were charged.

#### COMPLIANCE WITH DOMINION AND PROVINCIAL REGULATIONS.

By mutual arrangement between the two Governments, the Provincial Plant Quarantine staff, while enforcing our Provincial regulations, also comply with the regulations pertaining to the Dominion "Destructive Insect and Pest Act," as regards plant products and nursery stock imported into this Province and by way of this Province into other parts of Canada. By that method duplication and two sets of officials are avoided. The Dominion regulations also require all consignees to apply to Ottawa for permits to import nursery stock. Without these and the clear inspection certificates no such stock is allowed to clear Customs. Copies of all such permits are sent from the Division of Foreign Pests Suppression, Ottawa, to the Vancouver Plant Quarantine Office, where they are checked against the shipments as they arrive.

**INSPECTION CERTIFICATES AND FEES.**

Certificates were issued releasing imported plant products that passed inspection, and condemnation certificates on those condemned. Products condemned were shipped out of the Province or destroyed at the expense of shipper or consignee.

Inspection fees were charged on products that passed inspection, but not on those condemned.

**OBSERVATION-LIST.**

A certain class of plant products imported not generally associated with serious pest or disease were subjected to casual inspection only and recorded as observation-list for which no certificates were issued or fees collected. In the event of any such products becoming involved with pest or disease, warranting further precautionary measures, they would be transferred to the regular inspection-list. Products on the observation-list are recorded on tabulated form filed in the Department of Agriculture, Victoria.

**MAJOR PESTS AND DISEASES.**

We are very fortunate indeed that so far British Columbia appears to be free from many of the most injurious insect pests and plant-diseases that have cost other Provinces and countries enormous sums of money to control. Among such pests may be mentioned the brown-tail moth (*Euproctis chrysorrhoea*), not only a major pest affecting many varieties of trees and shrubs, but a serious pest to human beings owing to irritation caused by hairs shed from the larvæ. Several nests of this pest, containing large numbers of the living larvæ, have been intercepted this year at the Vancouver Inspection Station, where, during the last twenty-five years, they have frequently arrived on trees and shrubs from France and Holland. Any one of the nests could have established the moth in this Province.

Safely imprisoned in a breeding-jar at the Vancouver office is an egg-mass of the gypsy-moth, from which a whole colony of young larvæ hatched out shortly after its arrival at the inspection station on nursery stock from France—mute evidence of what would have happened if the stock had not been carefully inspected by men specially trained for that work. Other major pests not yet infesting products in British Columbia are the European corn-borer (*Pyrausta nubilalis*), potato tuber-moth (*Phthorimaea operculella*), Oriental fruit-moth (*Laspeyresia molesta*), Japanese beetle (*Popillia japonica*), and still others for which the Inspectors are continually on the lookout. Among the most serious plant-diseases from which the Province is apparently free are the potato-wart disease (*Chrysophlyctis endobiotica*), flag-smut (*Urocystis tritici*), and peach-yellows.

**NURSERY STOCK AND OTHER PLANT PRODUCTS INSPECTED, CONDEMNED,  
OR PROHIBITED ENTRY.**

Nursery stock of all kinds, such as trees, vines, bulbs, herbaceous perennials, etc., are carefully inspected and, when essential, fumigated. The result is that all nursery stock having passed inspection and fumigation is free of the insects and diseases common to them in the country in which they are grown and which are, to a large extent, unknown in this Province. During the past season over fifty different diseases and insect pests were recorded, a record that justifies the work which is being carried out at the present time. In addition, certain plants were refused entry under a Dominion embargo which prohibits their importation into Canada.

Fumigation is also extensively undertaken in such importations as corn, chestnuts, raisins, peas, etc.

**INSECTS OTHERWISE TREATED.**

Mediterranean flour-moth (*Ephestia kuhniella*) and weevil (*Calandra oryza*) infest rice from Japan. Rice was isolated until passed through hulling and polishing machines.

Similar insects to the above, including flour-beetle (*Tribolium*) and *Angoumois* moth larvæ, arrived in large shipments of corn from Argentine. The corn, which was in bulk, was unloaded from the boat directly through the cleaners at the elevator and conveyed through drying-kiln at a temperature of 215° F. The tailings from the cleaners were burned.

Other shipments of corn from the Argentine not so seriously infested were run through the cleaners and crushed, the tailings burned, and the empty sacks fumigated.

#### COUNTRIES FROM WHICH PRODUCTS WERE IMPORTED.

Particularly noticeable this year are the following: Oranges from Australia and Jamaica, as well as different fruits from the Fiji Islands. Wheat was also imported from Australia. The details of this importation are well worth noting.

The unusual importation of 53 tons of wheat from Australia, which arrived at Vancouver aboard R.M.S. "Aorangi," December 4th, caused considerable comment. The wheat in question was a low protein variety, imported by a Canadian milling firm for pastry-flour. They have previously obtained what they required from the U.S.A.

Owing to the danger of flag-smut (*Urocystis tritici*) in connection with wheat from Australia and Asia, our Dominion regulations require a proper certificate with every shipment to the effect that the disease in question does not exist in the district where the wheat was grown. Without such certificate the wheat cannot enter Canada. As no such certificate was in evidence, the importers were instructed to cable the Department of Agriculture at Sydney for same. A satisfactory reply was received from the Director of Agriculture at Sidney and the shipment was released after careful inspection and sample tests had been made by our Plant Pathologist.

#### "EGGS MARKS ACT."

Very little trouble was experienced in the enforcement of the Provincial "Eggs Marks Act" with regard to the few foreign eggs that were imported. Those imported from the United States included 81 dozen for hatching, imported during February to June at Victoria.

At Grand Forks 90 dozen were imported in February and four cases in May, the latter for commercial purposes and which complied with the Act.

The only other eggs imported were from China and were all preserved or salted whole eggs for the exclusive use of the Chinese residing in Canada. One hundred and twenty-four cases were reported at Victoria and 205 cases at Vancouver.

#### ELEVATOR GRAIN SCREENINGS.

The regulations relating to that portion of the Provincial "Noxious Weeds Act" dealing with grain screenings were given careful attention and were fairly well complied with so far as this office was able to check up.

Thirty-one dealers' permits were issued, covering a total of 393 car-loads of 30 tons per car for feed purposes, and one permit covering 100 tons for fuel.

Eleven feeders' permits were issued covering 69 car-loads for feeding stock within the Province after the premises of each applicant had been examined and his method of handling the screenings investigated.

A large quantity of the screenings obtained under the dealers' permits were recleaned and ground for sale to feeders within the Province and the tailings or refuse were mostly used for fuel.

Reports in duplicate were received each month from the several elevator and grain companies showing quantity of screenings handled.

#### PLANT PATHOLOGY.

The following brief summaries give an outline of the work undertaken by Department Plant Pathologists who are attempting to assist the growers in securing a satisfactory control for the plant-diseases at present attacking various cultivated plants:—

#### APPLE-SCAB CONTROL IN WEST KOOTENAY.

This work has already been carried on for two seasons and much information gained. It was hoped, therefore, that a third season's work would give such additional information as would enable the officials of the Department to materially assist growers in the control of this disease in the future. In addition to the phases of the problem studied in the two previous years, it was also decided to make tests of certain new spray materials. The great difficulty in scab-control is its relation to weather conditions, especially rainfall and humidity.

With indications for an early spring it was desirable to make advance observations on the maturation of the ascospores. Leaves were collected at intervals and forwarded from the Kootenay District to the Vancouver office for microscopic examination. On March 9th leaves were found with ascospores almost mature and further samples sent in between that date and

the 18th showed many spores at this stage. At this date the apple-buds in early locations were just beginning to swell. It was evident, therefore, that the first spore-discharge this season would antedate the breaking of the buds and preparations for field-work were made accordingly. A notice was given to the Nelson *Daily News* of March 19th, apprising growers of conditions and warning them to be ready to apply a spray when the McIntosh variety had reached the semi-dormant stage.

For comparison it may be mentioned that in 1930 the first discharge of ascospores was recorded April 25th, Gravenstein and McIntosh then being in full pink. In 1929 spores were not found until April 30th, the trees being then in the cluster-bud stage.

On checking over orchards in the Nelson District on April 9th, it was found that mature spores were to be found in almost any gathering of leaves and that many perithecea were already empty, discharge having taken place. The first spray notice appeared in the Nelson *Daily News*, April 13th, McIntosh and Gravenstein being then in the semi-dormant stage. Subsequent spray notices were given from time to time in accordance with the stage of growth of the trees, the state of the barometer, and such weather forecasts as were available. Thanks are due to the Nelson *Daily News* for its cordial co-operation in giving prominence to such notices, which were the chief means of advising growers in the district.

Spore-traps were placed out as in previous years at Willow Point and Sunshine Bay. Very few spores were found on the former, but, as in last season, discharge was very heavy at Sunshine Bay. The traps were discontinued, in accordance with last year's findings, after blossoming-time and reliance placed on spacing sprays in accordance with general conditions of growth and weather. It is of great interest to note, however, that in spite of early development of the first ascospores, progressive development and discharge apparently continued through the season. On June 8th, when numerous conidia were to be found on scab-spots on the foliage and young fruit, old leaves collected from the ground showed mature ascospores which discharged in the laboratory and showed a high percentage of germination. It seems certain, therefore, that ascospores produced infection from the first beginnings of growth until the end of June. In the three years' observations it has been found each year that spore-discharge has lasted more or less steadily over a long period. There has been nothing approaching the condition reported in some areas (Bulletin 403, Ohio Agric. Exp. Sta.), when spore-discharge lasted for an eight-day rain period and then ceased.

June was an exceedingly wet month, rain falling every day from the 15th to the 30th, inclusive, with a total of 4.08 inches for the month, and it was feared that scab would become epidemic. However, when the crop was harvested, conditions were found to be on the whole much better than last year, indicating that if scab is controlled in the early stages it can be kept under control in spite of unfavourable conditions later. While June was wetter than in 1930, May had only 1.67 inches, against 3.50 in 1930; while in April, from the 15th to the end of the month, no rain fell, as compared with 1.69 inches in 1930. This difference in weather condition combined with earlier spraying accounted for the improved condition. One Cox orchard from which less than 300 boxes were shipped in 1930, all C grade, on account of scab, yielded 1,200 boxes extra fancy in the last season.

#### NEW SPRAY MATERIALS.

In the past year or two considerable attention has been given in the United States to calcium monosulphide as a fungicide. This has been put out under the trade-name of Cal-mo-sul. A quantity of this material was imported and tested out against lime-sulphur. Another preparation of calcium monosulphide made by the Consolidated Mining and Smelting Company of Trail was also tested, and a small test made of the K.S. resin spray developed by Dr. Newton, of the Dominion Laboratory of Plant Pathology at Saanich.

#### RASPBERRY-DISEASES.

Some attention was given to the situation in the Mission-Hatzic area. Cane-blight (*Leptosphaeria coniothyrium*) was very prevalent and destructive, a fact which may be connected with the occurrence of yellow rust (*Phragmidium imitans*) in epidemic form in 1930. The serious loss, however, from more or less sudden dying of the whole plant does not seem explicable by any of the diseases recognized as present. A number of cultures were made from diseased roots and canes on the suspicion that *Verticillium* might be present, but the results were all negative. *Verticillium* wilt has, so far, not been observed in British Columbia.

A detailed study of the raspberry-diseases in the Fraser Valley, their relative importance and means of control will form the major project for next year's work. The section of Horticultural Circular 55 dealing with raspberry-diseases was rewritten for a revised edition of the circular.

#### OTHER FIELD-WORK.

During the first week in July examination was made of a number of fields of canning-peas on Lulu Island. A little downy mildew (*Peronspora viciae*) was found, but was not doing any appreciable damage.\* In certain fields, however, patches usually small, but sometimes of considerable size, had been killed out by some form of root-rot. These often corresponded with the low-lying spots in the field and a clay soil. June was the wettest June on record and under such conditions the soil had no doubt been water-logged. Cultures of dying roots yielded in most cases a species of *Fusarium*. Whether this is the specific root-rot fungus (*Fusarium martii* var. *pisi*) or some common soil organism attacking roots already dead or injured by water-logged conditions remains to be determined. The killing-out was only found where soil conditions were very unfavourable to the crop.

Following the loss from tuber-rot of potatoes (due apparently to *Fusarium radicicola*) in the Grand Forks District in the fall of 1930 a number of growers, dealers, and others were visited in the spring. It seemed to be the consensus of opinion that where the crop had been well matured before digging there had been little trouble with rot. A questionnaire was prepared and distributed to growers in case of a recurrence of the disease, but there seems to have been little cause for complaint this year.

#### MISCELLANEOUS DISEASES AND OTHER WORK.

A case of bacterial blight of alfalfa (*Pseudomonas medicaginis*) was found near Edgewood, but injury was not severe. The identity of the organism was confirmed by cultures. A case of plum-pockets or bladder-plum (*Taphrina pruni*) was sent in from the City of Vancouver. This is the first case reported to this office, although the disease is common in Eastern Canada. Several cases of club-root (*Plasmodiophora brassicae*) were reported, and apparently the disease is destructive in some of the Chinese market-gardens around Vancouver and New Westminster.

In July a species of *Botrytis*, probably *B. cinerea*, was found to be killing the tips of the twigs of deodar in nurseries of ornamentals at Vancouver and also at the Dominion Experimental Farm, Saanich. The injury done in such a case is liable to be out of proportion to the actual tissue destroyed, since the growth of the tree is liable to be rendered unsymmetrical and the tree deformed. *Botrytis cinerea* has been recorded from a number of coniferous trees, but not apparently from *Cedrus deodara*.

A number of instances were found of ornamental pyracantha (*Crataegus pyracantha*) heavily attacked by a *Fusicladium* closely resembling that of apple-scab. In some cases the young berries were quite black and their ornamental value much injured.

*Fruit-blight of Raspberry and Loganberry*.—A bacillus has been repeatedly isolated from diseased fruit and has been found capable of reproducing the disease when inoculated into blossoms and fruits of raspberry, loganberry, and thimbleberry. A careful study of this organism has been made as well as of certain other organisms found associated with it. The rôle played by thrips was shown by using plants completely screened in by frames covered with cheese-cloth. All caged plants were sprayed with nicotine sulphate and whale-oil soap in the bud stage. Insects (thrips) were introduced by placing in the cage 1,000 c.c. of loganberry-flowers on which were numerous insects, chiefly thrips.

Results: Caged and no insects introduced, 1.5 per cent. blighted fruit; caged and insects introduced, 38.5 per cent.; check (uncaged), 70.5 per cent.

A field experiment was carried out with a view to ascertaining whether the loss from blight in loganberries could be affected by the use of artificial fertilizers. Ammonium sulphate, triple superphosphate, sulphate of potash, ammonium phosphate, complete fertilizer, and lime were used, but no significant difference in the percentage of blighted fruit was found.

A field experiment was conducted in the hope of finding an effective spray period in combating blight. Lime-sulphur, K.S. resin, oil-nicotine sulphate, nicotine sulphate, whale-oil, and X spray were used. The times of application were semi-dormant, flower-bud, early flowering, and late flowering. There were no conclusive differences in the results. A hand-sprayer was used and it apparently did not have sufficient pressure to reach the thrips, which are considered

to be the chief agents of inoculation. Two commercial plantings, however, which were sprayed with nicotine sulphate and whale-oil soap, applied with a power-sprayer, gave much better results. In one the loss was reduced to 1 per cent. and in the other to 4 per cent. of the fruit, while two unsprayed plantings had 17 per cent. and 24 per cent. loss respectively.

*Stem-end Hard-rot of Potato.*—A new disease of the potato-tuber for which this name is suggested has been studied. Affected tubers were first brought in by Mr. H. S. McLeod, of the Dominion Inspection Service, and showed a hard, dry, corky, stem-end rot. The rot spreads outward from the centre of the stem-end in all directions, resulting in a slightly sunken circular lesion with a sharply defined margin. The lesions vary from a pin-head to the whole of the potato. Often many of the small tubers are completely mummified and dark brown or black in colour. Brown or black specks often appear through the epidermis on the lesion and extend a little below the surface. In a longitudinal and vertical section the black, corky lesion has advanced most rapidly towards the centre of the inner medulla, making a conical-shaped distinct hard rot with a definite margin. A die-back and leaf-spot of the growing plant are probably associated with it, but the connection has not yet been conclusively established.

From the diseased tubers an organism has been consistently isolated and proved by inoculation to reproduce the disease. It is a hitherto undescribed fungus for which the name *Phomopsis tubivora* Gussow and Foster is proposed. The disease has only been in the Fraser Valley and at Sidney, V.I., but on eight varieties. A technical paper has been prepared and will be submitted for publication early in the year.

*Leaf-mould of Tomato (Cladosporium fulvum).*—A number of greenhouse-men in the vicinity of Victoria complained of injury from this disease in spite of the sanitary measures usually considered effective. In one case painting (melted) sulphur on the steam-pipes had been tried in addition without noticeable effect. A greenhouse not any too well ventilated and in which mildew was getting well established was selected and finely divided sulphur dusted over the steam-pipes weekly. This proved more effective, the degree of infection in the treated house being estimated at 18 per cent. as against 72 per cent. in the check.

*Soil-infection and Bunt of Wheat.*—Bunt was unusually prevalent in British Columbia in 1930 and 1931, especially in winter wheat. Apparently considerable infection has occurred even when the grain has been treated with disinfectants to kill adhering spores. Presumably, therefore, infection occurs from spores in the soil. To test this, bunt-spores were sown in rows and disinfected Dawson's Golden Chaff wheat sown in these rows. When the grain was mature the percentage of bunt was determined. Where untreated grain was used 15 per cent. of bunt developed, with formalin treatment 9.5 per cent., and with copper carbonate 8.2 per cent. A check-plot with no bunt-spores in the soil gave no infected ears. Evidently, therefore, there was quite a heavy infection from the spores placed in the soil.

#### ENTOMOLOGY.

Entomological work such as was undertaken by this Department constitutes an important section of the agricultural activities in the Province. The different phases of this work which combine both control and research in so far as insect-life is concerned are very fully reported on in the annual Entomological Report on file in the Department.

*Codling-moth (Cydia pomonella).*—Spray tests and flight records of this insect were again our major projects for 1931. The year 1930 was an unfavourable year for the codling-moth. The mild winter of 1930-31 and the favourable climatic conditions of 1931, however, produced an abundance of moths. This, although not desirable from the growers' standpoint, gave us ample material for our tests and produced definite results.

The great increase of moths was particularly evident at Winfield and Kelowna, where as much as 60 per cent. of wormy fruit was reported from some of the orchards. Although there has been a great improvement in the application of sprays in the last few years by the growers, they have not yet attained the thoroughness necessary for satisfactory control of the codling-moth. This is perhaps due to the unsatisfactory market conditions over several years, and the reduction of the cost of production being attempted. This would tend to an attempt to reduce the quantity of spray material used, with the result of there being too small a quantity of spray used per tree, lack of thoroughness in application, and a resultant increase in the percentage of wormy fruit.

Without going into detail with regard to sprays used, date of application, etc., it is considered advisable to submit in conclusion a summary of results obtained.

- (1.) No advantage was noted in the use of oil sprays on any plots.
- (2.) The omission of the second cover-spray on three trees on Plot 3 did not increase the amount of wormy fruit or stings.
- (3.) The third cover-spray applied on Plot 2 on July 28th and not followed by a fourth spray produced a high percentage of worms, indicating definitely that this spray was applied too early.
- (4.) The third cover-spray applied on July 28th on Plots 1 and 4, followed by a fourth cover-spray on August 10th, gave excellent control, both of stings and worms.
- (5.) The third cover-spray date set for July 27th, to be completed by August 5th, should have given fair control as demonstrated on Plots 3, 5, 6, 7, 8, and 9, on which this spray was applied on August 3rd on the spray plots, and showing an average of 2.58 wormy fruit for the six plots.
- (6.) Plots receiving one or more applications of 3 lb. of arsenate of lead to 80 gallons of water in the cover-sprays showed distinctly better results than the plots receiving only 2 lb. of arsenate of lead to 80 gallons of water in the cover-sprays.
- (7.) Only 1 lb. of commercial spreader was used to each tank of 240 gallons (imperial) of spray. This gave an excellent covering of the arsenate of lead. An increase in the quantity of commercial spreader might have given better results in the control of stings. The fish-oil spreader did not appear to give a better covering of lead than the commercial spreader and it is more difficult for the grower to handle.
- (8.) The results of this year indicate the possibility of advancing the date of the second cover-spray to the end of July and the third to early August. A better coverage is needed for the second brood as indicated by Plots 1 and 2.
- (9.) On the Staples plots, with trees of maximum size, fairly dense tops, and heavy foliage, good control was obtained with an average of 6.7 per cent. stings and 2.06 per cent. wormy fruit. This orchard indicated heavy infestation in 1930.
- (10.) It is recommended that 3 lb. of arsenate of lead instead of 2 lb. be used for each 80 gallons of water for all cover-sprays.

*Poisoning of Bees with Arsenical Sprays—Work with Repellents*—The great loss of bees through poisoning with arsenical sprays in recent years through the increased use of arsenates in the areas affected with codling-moth makes it necessary that a thorough study of possible repellents be undertaken. In 1930 Mr. Turnbull, of Penticton, reported the loss of 300 colonies. Other losses, though not as large individually, were very heavy. A study was made of all available literature on the numerous attempts to find a satisfactory repellent. No indication was found in these of results which would indicate a possible line of further experiments. The only definite indication of repellent action against bees noted were cresol preparations, but satisfactory results were not obtained.

It therefore was necessary to develop a definite research problem and a search was made for new chemicals which might act satisfactorily as repellents. Through extended correspondence with numerous chemical-manufacturing concerns a list of some 2,000 experimental chemicals was obtained. From this list the following chemicals were selected and small quantities purchased: Ethyl N-Caprate, Ethyl N-Caproate, Ethyl N-Caprylate, Ethyl Cinnamate, Ethyl N-Valerate, and Ethyl N-Amyl Ether. As these chemicals were not obtained in time to prepare them for experimental tests during the summer of 1931, they will be prepared for extended tests during 1932.

During 1931 cresylic acid was prepared in the form of cresoap, and strengths from 1 to 5 per cent. were tested. Although these indicated repellent action, the lower strengths to 3 per cent. did not repel long enough to allow the sprays to dry. The higher strengths caused injury to vegetation. This work will constitute a major project during 1932.

*Mealy Bugs (*Pseudococcus* sp.).*—These insects, usually considered greenhouse or semi-tropical pests, occur at Nelson, particularly in the Willow Point District. They also occur on the C.P.R. main line and have been reported from Revelstoke and Blind Bay to Sorrento. At Willow Point the infestation is severe, cherries and apples being particularly affected. The regular nicotine sprays applied in the spring did not give appreciable control and requests were made to find a satisfactory control.

On July 6th the following spray tests were made at the J.J. Campbell orchard at Willow Point:—

Clensel 3 per cent: No perceptible control.

Pysect 1-1200: No perceptible control.

Pysect 1-1200 plus 1 per cent. olive-oil: 25 per cent. control.

Pyrocide 40 1-1200 plus casein emulsifier and  $\frac{1}{2}$  per cent. fish-oil: 80 per cent. control.  
This emulsion did not hold up well with hard water.

On August 22nd the following sprays were tested: 6 per cent. coal-oil emulsion (cold mix) plus Pyrocide 1-1200: 90 per cent. control.

The cold-mix coal-oil emulsion plus pyrocide indicated excellent control. The trees were heavily coated with loose bark which interfered with the results. Mr. Campbell will have the trees scraped this winter and use the cold-mix coal-oil emulsion on a commercial scale in the spring.

*Woolly Aphid (Eriosoma lanigera Haus.).*—This insect, due to the exceptionally mild winter, survived in large numbers on the trees, resulting in an early spread to the tree-tops, and growers experienced considerable difficulty in control.

This insect has now made its appearance in the Grand Forks, Kamloops, Nelson, and Creston areas, and may now be added to the list of permanent pests for these districts. Its control is difficult and requires thorough attention to details and application of spray. High pressure is necessary for spray applications; 400 to 500 lb. pressure being necessary for satisfactory control. In districts where the perennial canker is present special precautions are necessary, and the banding of trees subject to canker with tanglefoot during May is advised. All cankers must be treated with canker-paint in July and the trees kept free of woolly aphid to the end of the season.

*Wire worms (Various Species).*—There appears to be no abatement in the annual loss through wireworm-injury. Potatoes and onions were again severely injured in several districts; one onion-crop noted was practically a total loss.

Our observations seem to point to alfalfa as a practical rotation crop. Alfalfa land ploughed after a three-year crop is practically free of wireworms. This should be more fully tested out in districts where alfalfa can be satisfactorily grown.

*Pocket-gopher (Thomomys fuscus).*—These persistent creatures take their annual toll without diminution. Their control is not difficult but requires persistent attention. Where cover-crops are grown they are not so readily located and a persistent search for their runs is necessary. When the location of the run is found the use of a blunt-pointed prod to find the main run is used and a small opening made. A small piece of fresh carrot, turnip, or parsnip lightly dusted with a mixture of castor sugar and strychnine is inserted into the main run and opening closed. If this method is persistently followed, excellent control is soon obtained. Land under clean cultivation can be more cheaply treated with good traps properly set and receiving regular attention.

*Insecticides tested.*—Each year there are a number of new spray materials which make their appearance on the market. These have to be tested by departmental officials before they can be recommended to the growers as being suitable for pest-control work, both from the standpoint of control and cost. During the past year a number of these new sprays were tried, some with very satisfactory results. Amongst the many which were used this year the following are the most important: Hesthanol, Nicotine Sulphate 40 per cent., Winter Wash (a local tar distillate prepared in England), Clensel, Pysect.

Work with a number of these sprays will be carried out again in 1932 in order to check with the results obtained this year.

#### FIELD CROPS.

During the year a considerable quantity of seed-grain and other seeds were distributed among those farmers who are planning on exhibiting at the World's Grain and Seed Exhibition in 1933. In view of the importance of obtaining the very best material, elite seed was supplied wherever possible. The following is a list of the seed distributed:—

Wheat, 2,062 lb.; oats, 2,151 lb.; barley, 765 lb.; rye, 227 lb.; flax, 55 lb.; corn, 30 lb.; peas, 775 lb.; soy-beans, 267 lb.; alfalfa, 40 lb.; clover, 236 lb.

#### SEED PRODUCTION.

Every effort has been made during the year to encourage the production of seeds in those areas of the Province considered suitable for same. At the time of writing this report records of the amount of seed produced this year are not complete. It is interesting to note, however,

that figures released last March showed that the following quantities of field-crop seeds were produced in British Columbia in 1930:—

	Lb.		Lb.
Mangel .....	6,545	Alsike clover .....	3,000
Swede turnip .....	740	Red clover .....	130,000
Alfalfa .....	36,000	Timothy .....	16,000

Before farmers are encouraged to produce seed on a large scale it is essential that good stock seed of proper varieties or strains are available.

#### WEED-CONTROL.

The "Noxious Weeds Act," which has been amended at almost every session of the Legislature for several years, was materially altered and passed in its new form at the 1931 session. Special attention was focused on the Peace River District, where every effort must be made to control weeds before they become firmly established.

From observations made on plots sprayed last year by this Department, and also in checking up work done by others, it would appear that weed chemicals are too expensive to be used on a large scale by farmers even if they are effective, although they may be found quite satisfactory in controlling weeds on roadsides where annual cutting of weeds might be found to be too costly.

#### SEED-CLEANING MACHINERY.

In co-operation with the Dominion Seed Branch the Department placed seed-cleaning machines in the following districts during the year: Lytton, Rolla, and Armstrong. A demonstrating-machine was also placed at the University of British Columbia for cleaning up small quantities of special kinds of seed and for class-room use.

#### CROP COMPETITIONS.

During the year two combined field-crop and cleaned-seed competitions and nineteen standing field-crop competitions were held. The districts in which these competitions were held are as follows:—

*Standing Field-crop Competitions.*—Saltspring Island, Denman Island (two competitions), Delta, Surrey, Fort Langley (two competitions), Pemberton Valley, Kent, Forest Grove, Prince George (two competitions), Houston, Palling (two competitions), Bulkley Valley, Evelyn, Kootenay River, and Newgate.

*Combined Field-crop and Cleaned-seed Competitions.*—Cariboo and Bulkley Valley.

These competitions are of value in many ways: (1) They encourage the co-operative spirit among members of the various organizations under whose auspices the competitions are conducted; (2) they encourage the use of good seed of standard varieties; (3) they stimulate the production of certain crops in areas where it is felt such crops should be grown on a commercial scale.

#### BRITISH COLUMBIA WINTER FAIR.

The annual British Columbia Winter Fair was held in Vancouver, November 30th to December 3rd, and in this connection the Provincial Seed and Root Fair was held as usual. Nearly 500 entries of seeds of all kinds, potatoes, and roots were received, which constitute the largest number of exhibits to be sent into the Winter Fair in any year. The high quality of the exhibits was very noticeable and a marked improvement over previous years. Exhibits of seed were sent in from all parts of the Province and once again demonstrated the possibilities existing in this Province for seed-growing.

#### WORLD'S GRAIN AND SEED EXHIBITION.

Efforts have been made to continue to interest our farmers in this exhibition, which has now been postponed until 1933, due to the economic conditions throughout the world to-day. This change in the date should prove very beneficial to our British Columbia exhibitors, since most of them have had little experience in exhibiting at large exhibitions outside the Province. It is generally agreed that the World's Grain exhibition is of particular value in getting our

farmers to grow the right kind of seed. It is also proving the means of getting certain kinds of seed produced within the Province which we have heretofore been importing.

#### PLOUGHING-MATCHES.

In order to encourage better ploughing throughout the Province, assistance has been given by the Department in connection with the holding of local ploughing-matches and also the holding of a Provincial ploughing-match.

Local ploughing-matches were held at Vernon, Comox, Fort St. John, Rolla, and Matsqui. The Provincial ploughing-match, which was held at Chilliwack, proved very successful and has already been fully reported on.

#### MISCELLANEOUS FORAGE AND PASTURE PLANTS.

During the year seed of the following plants was distributed in small quantities for test purposes: Soy-beans, subterranean clover, and *Paspalum* grass.

*Soy-beans*.—The soy-bean seed distributed was registered seed of the O.A.C. 211 variety obtained from a prominent farmer in Ontario. The tests were confined to the Fraser Valley. The reports on this work are incomplete, but field observations would lead one to believe that soy-beans can be produced satisfactorily for forage purposes in the Fraser Valley, but as a rule it is not possible to obtain a crop of seed. However, there would appear to be room for considerable experimental work in testing out varieties, as it may be possible to secure an earlier maturing variety.

*Subterranean Clover*.—Seed was obtained from Australia as this plant has proven a valuable pasture plant in that country. It is a prostrate, soft, woolly annual, all parts of which are covered with a fairly long growth of soft hairs. Immediately after flowering the lower shoots turn downward and force their seed-pods into the ground.

Seed was distributed in small quantities in various parts of the Province and field observations made during the summer revealed the fact that in most cases the seed had germinated well and good stands had been secured. However, further information will be available when the plots are checked up next summer.

*Paspalum Grass*.—This plant is a native of South America and was introduced into Australia many years ago. It is a perennial of strong deep-rooting habit and with growth of a bunchy nature. The leaves are numerous near the ground, but with few on the stems. A small quantity of seed was obtained from Australia and placed in the hands of several farmers. The reports on these plots received so far have not been satisfactory and it appears that in several instances the seed did not germinate.

*Alpha Sweet Clover*.—A small quantity of seed of this plant was obtained from Professor Kirk, Dominion Agrostologist, who was at the time Professor of Field Crops at the University of Saskatchewan. In fact, Dr. Kirk was the originator of this plant, which is a selection. The seed germinated well and an excellent stand was obtained by the one farmer who conducted the test. Further information concerning this plot will be available later.

*Wild Clover from Orkney Islands*.—Small quantities of wild white clover seed have been secured from the Orkney Islands, Scotland, and have been supplied to District Agriculturists for distribution among farmers who will give it a trial.

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#### ANIMAL INDUSTRY DIVISION.

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##### HORSES.

The horse situation has changed but little since 1930. The world depression has had a tendency to force farmers and some commercial organizations to return to horse-power transportation. The supply of high-class draught horses is as usual much below the market requirements. Good prices can always be had for the quality heavy draught. A lot of undesirable horses from the range country have been sent to packing-houses for slaughter to supply a market outside the Dominion and to supply certain markets within the country requiring meat for other than human consumption.

A number of high-class remounts were selected in the Nicola country by the Royal Canadian Mounted Police. They were good, breedy, upstanding, well-broken bay, brown, and black geldings, 3 to 7 years old, free from blemishes, and capable of carrying a heavy rider. Prices up to \$175 were paid.

Statistical reports show 548 stallions in 1931, compared to 643 in 1930; mares, 2 years old and over, 28,670 in 1931, compared to 28,165 in 1930; geldings, 2 years old and over, 29,835 in 1931, compared to 30,068 in 1930; colts and fillies under 2 years of age in 1931 numbered 5,853, as compared to 6,210 in 1930. The total horse population in 1931 was 64,904, as compared with 65,083 in 1930.

#### BEEF CATTLE.

Cattle came through the winter in quite good condition. In fact, in a large part of the range country stock grazed most of the winter without supplementary feeding. Prices dropped during the year to pre-war levels, with good steers going from 4 to 5 cents and cows at from 2 to 3 cents. The demand even at these low prices was not keen, except for very top stuff. Packers refused to handle many shipments and as a result they had to be held back; in fact, a lot of beef had not been moved by the end of November.

The first shipment of grass beef was reported from Savona on June 10th. In the Cariboo the range was reported to be in very poor condition during the early backward spring. Calves wintered on the lower ranges quite successfully and were drifted back to the summer ranges in April and May. More beef was finished last winter and spring in the Cariboo District than ever before. The finishing was done almost entirely on alfalfa-hay. The lack of grain to do finishing-work in that district is one of the most serious handicaps to the range beef-cattle industry.

Mr. C. E. Wynn-Johnson, of Alkali Lake, shipped a number of feeders to Vancouver to be grain-finished at the B.C. Live Stock Exchange. Very favourable reports came from this experiment and it would look to be one of the possibilities offered the Cariboo rancher of handling his lighter finished stock. It is worthy of note that British Columbia grass-finished cattle are of sufficiently high quality that they can qualify under the red or blue label classification of the Dominion Government grading system.

The usual difficulties were encountered with wood-tick and different poisonous weeds. Due to the dryness of the season, more cattle than usual were affected with *Astragalus campestris* poisoning. Dairy-cattle herds located within or adjacent to the range country seemed to suffer very severely.

The usual number of beef bulls were purchased by ranchers, and in spite of the lower price of beef the ranchers from the Cariboo country seem to have secured a very much larger number of good bulls this year. Five car-loads of good Hereford and Shorthorn bulls entered the Cariboo District from Alberta, besides a number of pure-bred unregistered bulls from the Kamloops and Ashcroft Districts. In addition, a number of bulls went into the Kamloops District from the Kamloops Bull-sale under the Provincial Department Farmers' Institute policy.

There has been a complete change in the type of the bull on the range in the last two years and the practice of exchanging aged bulls is dying out amongst the ranchers. Mr. R. C. Cotton, Williams Lake, imported a foundation herd of shorthorn females from Alberta and aims to supply high-quality Shorthorn sires to ranchers in the surrounding district.

The calf-crop throughout the range area averaged 60 to 65 per cent. This weakness in the industry deserves attention. Some of the contributing causes no doubt are breeding-diseases, too few herd sires, the use of old herd sires, the lack of breeding pastures, and faulty range-management in general.

Quite a serious outbreak of contagious abortion occurred in a section of the range country which received the attention of veterinary officials of the Provincial and Dominion Departments of Agriculture.

A number of good beef bulls were imported into the Grand Forks District to support the range herds and several car-loads of good beef heifers have come in under the Dominion Department of Agriculture free-freight policy. Some 158 head of breeding heifers and young cows of Shorthorn and Hereford breeding went into the northern part of the Province from Burns Lake to McBride under the Dominion free-freight policy as foundation stock for the farmers of that territory.

With the idea in mind of strengthening one of the weak features of our beef-cattle industry, a feeder experiment was arranged with the co-operation of the B.C. Beef Cattle Growers' Association under the supervision of a representative of that organization and the Assistant Live Stock Commissioner. Some 280 head of high-class feeders have been placed with farmers for finishing. Under the agreement the rancher retains ownership of the cattle and receives payment at the time that the cattle are marketed. This scheme makes it possible for the smaller man to secure cattle for feeding without any immediate outlay. It also assists the rancher, in that he is able to get a number of feeder cattle properly finished for market. If the experiment proves successful it is hoped that next year a larger number of feeders will be placed with farmers throughout the Province. A special endeavour will be made to get away from transportation costs as far as possible by moving feeder shorter distances from the ranches to the feeding-lots on the farms. Assistance and advice are being given to those feeding the cattle in an endeavour to train as many farmers as possible in the business of cattle-finishing.

#### BRANDED BEEF.

This Division has co-operated very closely with the Federal Department of Agriculture, Live Stock Branch, Cattle Division, on their work in popularizing the branded beef within the Province. In the Dominion of Canada during the year 1931 there was a total of 6,346,558 lb. of Red Label beef consumed. British Columbia stood second in the Dominion with a consumption of 1,417,617 lb., the Province of Ontario being the only Province to consume more Red Label beef. In Canada during the year 1931 a total of 10,894,190 lb. of Blue Label or second-grade beef was consumed, British Columbia consuming only 182,744 lb. In the Dominion during the year 1931 there was a total of 17,240,748 lb. of graded beef consumed, British Columbia consuming 1,600,361 lb.

Breed.	No. of Head.	High.	Low.	Average.	Total.
Shorthorns.....	29	\$250.00	\$35.00	\$141.00	\$4,090.00
Herefords.....	31	450.00	100.00	218.00	6,665.00
Aberdeen Angus.....	4	125.00	50.00	97.50	390.00

The Fat-stock Show was the largest in the history of the sale and attracted entries from all parts of the Province. In the group classes there were 11 breeders entered; in the single classes, 23 breeders; and in the boys' and girls' baby-beef competition there were 21 entries. The following prices were received at the auction sale:—

Class.	No. of Head.	High.	Low.	Average.
Car-lots and groups.....	18	Cents. 8.00	Cents. 5.75	Cents. 6.50
Single steers .....	52	15.50	5.35	6.69
Boys' and girls' baby-beef competition.....	25	25.00	5.50	7.62

#### DAIRY CATTLE.

The world depression has had its effect on the dairy-cattle men of this Province, and while there has been an increase in the numbers of dairy cattle in the Province it is natural to expect that interest in the details of the work has not been as keen in many sections of the intensely dairying part of the Province. It has been found difficult to keep up the interest of even some of the best dairymen in the work of cow-testing. Their lack of apparent interest is not as a criticism of the work, but when any business is not profitable it is difficult to find funds to carry on some activities and to keep up interest in what is not proving a highly profitable business.

In some of the outlying sections of the Province there has been a tendency to give dual-purpose cattle more consideration, because this class of cattle makes it possible to change from dairying to beef, or vice versa, in order to meet sudden changes in market requirements.

## NUMBERS OF CATTLE IN BRITISH COLUMBIA, 1930-31.

	1930.	1931.
Bulls, 1 year and over.....	8,525	8,710
Cows kept mainly for milk purposes.....	118,649	119,511
Cows kept mainly for beef purposes.....	90,116	84,232
Yearlings being raised mainly for milk purposes.....	26,976	26,501
Yearlings being raised mainly for beef purposes.....	53,667	50,415
Calves under 1 year old.....	65,599	64,314
Other cattle not listed above.....	40,757	36,726
 Total number of cattle.....	 404,289	 390,409

## BRANDS.

Statements showing shipments of cattle and hides from the various districts of the Province are included in Agricultural Statistics Report, 1931.

## NEW "STOCK-BRANDS ACT."

Following on the preparatory work done in 1930, the new Act was duly passed by the Legislative Assembly in the spring and came into force on June 1st. A great deal of work was necessary to familiarize ranches, dealers, and all others connected with the beef industry, with the new requirements, as well as to instruct the Inspectors in their increased duties. For this purpose printed and stencilled forms to the number of 62,550 were required.

As a result of this advance work the new regulations came into force smoothly, with a minimum of friction and misunderstanding. The few complaints received came from outlying districts, where the need for stricter inspection and resulting better protection for the stock-owner was not fully realized. Complaints against increased recording fees were less than 1 per cent.

## INSPECTION-WORK.

As this is the first report since the passing of the new Act, the organization of the inspection service is set out as follows:—

*Cariboo District*.—Inspector in charge, Williams Lake. Supervising Inspector, Williams Lake, with inspectors stationed at Lac la Hache, Soda Creek, and Hanceville.

*Cariboo (South) District*.—Inspector in charge, Clinton. Supervising Inspector, Clinton, with Inspector at 100-Mile House.

*Yale District*.—Inspector in charge at Ashcroft, with Inspectors at Lytton, Lillooet, and Spences Bridge.

*Kamloops District*.—Inspector in charge, Kamloops. Supervising Inspector, Kamloops, with Inspectors at Chase, Blue River, Merritt, Nicola, and Salmon Arm.

*Boundary District*.—Inspector in charge at Penticton, with Inspectors at Summerland, Coalmont, Grand Forks, Greenwood, Keremeos, Oliver, and Princeton.

*West Kootenay District*.—Inspector in charge at Nelson, with Inspectors at Creston, Kaslo, New Denver, Rossland, Salmo, and Trail.

*East Kootenay District*.—Inspector in charge at Cranbrook, with Inspectors at Fernie, Kimberley, Natal, Wardner, Yahk, and Canal Flats.

*North-east Kootenay District*.—Inspector in charge at Revelstoke, with Inspectors at Golden, Nakusp, and Invermere.

*Vernon District*.—Inspector in charge at Vernon, with Inspectors at Enderby, Kelowna, Lumby, and Armstrong.

*Fort George District*.—Inspector in charge at Prince George, with Inspectors at Giscome, McBride, Red Pass, Vanderhoof, and Fort Fraser.

*Hazelton District*.—Inspector in charge at Smithers, with Inspectors at Burns Lake, Hazelton, Telkwa, Houston, Woodcock, Endako, and North Bulkley.

*Peace River District*.—Inspector in charge at Pouce Coupe, with Inspectors at Fort St. John, Rolla, and Hudson Hope.

*Prince Rupert District*.—Inspector at Bella Coola.

*Chilliwack District*.—Inspector in charge at Chilliwack, with Inspectors at Hope and North Bend.

New Inspectors were appointed at Soda Creek and Summerland.

It is only fitting that tribute should be paid here to the Inspectors, especially the Provincial Police Inspectors, for the efficient and thorough manner in which they have generally carried out the extra work imposed on them. Inspectors Cahilty at Kamloops and Job at Nicola have been particularly active in checking up on unregistered brands.

Now that copies of all inspection certificates are received at Victoria it has been possible to make a thorough check-up on the brands being used. A 100-per-cent. registration of brands used will probably never be attained, but in the meantime a start has been made by getting forty-three delinquent horse and cattle brands put on the records. The large number of unregistered Indian brands has been the cause of trouble in some districts, but with the co-operation of the Indian Agents and Brand Inspectors considerable improvement is anticipated before long.

To facilitate their work part-time Inspectors were supplied with official badges, and in the more important districts Inspectors were provided with clippers and gum-boots.

#### PROSECUTIONS.

Two cases of slaughtering without a licence and of slaughtering at other than a licensed slaughter-house in the Okanagan-Similkameen District were prosecuted successfully. One case in the Cariboo District of illegal branding and using an unregistered brand was lost because of want of proof that the offence took place within the previous six months, and another case at Nicola could not be prosecuted for the same reason. In the Nicola District a sentence of three years was imposed for cattle-stealing, but another case of alleged horse-stealing was lost.

#### BRAND REGISTERS.

The brand registers were entirely rewritten in a condensed form and a complete index prepared on a new system. The result has been much more efficient handling than under the former system.

The number of brands recorded, renewed, etc., during 1931 was as follows:—

	Recorded.	Renewed.	Reissued.	Transferred.	Total.
Cattle-brands.....	155	260	33	10	458
Horse-brands.....	54	194	21	5	274
Total.....	.....	.....	....	....	732

The number of licences issued was: Hide-dealers, 36; slaughter-house, 46; beef-peddler, 12.

#### SHEEP.

The lambing percentage this year was perhaps the best on record, being from 10 to 30 per cent. above the average of former years. On the range it reached an average of from 120 to 130 per cent. One large outfit reports a lamb-crop of 167 per cent. Ewe bands wintered well and lambs were in good growing shape when they started for the summer range in the mountains.

The first large shipment went out of the range country on June 6th from the ranch of Mr. H. W. Hayward, of Pavilion, B.C. This is probably a record for the range country. These lambs were dropped in February and March and some of these early shipments sold for 13 cents w.o.c. in Vancouver. In fact, good prices were received during the early part of the season from June on for a few weeks, but gradually fell away to the place where returns paid little or no profit to the rancher. Lamb prices have held steady through from September, October, November, and into December at about \$6 to \$6.50 for choice spring lamb off cars at Vancouver. Breeding ewes were selling in September for about \$5 to \$6 apiece, but had dropped down to from \$4 to \$5.50 apiece by the middle of December.

The sheep industry has apparently settled down considerable in the last year or so. There are fewer inexperienced people rushing into the business with the thought of making big profits.

Last year attention was drawn to a survey made of the sheep industry throughout the Province. The findings of this survey appeared in the 1930 Annual Report. Results obtained

were even beyond what was expected. The packers reported that never before had lambs reached the market with the same quality and uniformity. Marketings were very orderly, with excellent continuity, which had a steady effect on the market. In addition, the range lambs reached the market from six to eight weeks earlier than ever before and entirely shut out the outside product, which in other years came in on this bare spot on the market and took the very cream of the trade. Thousands of dollars as a result remained in the Province and went to the support of the sheep industry.

The sheep industry was again directed, previous to the breeding season, to follow out a similar programme this year of early breeding so as to take care of this fancy market, and it is hoped that in future British Columbia sheep-breeders will take care of this desirable early market. In some sections of the country where ewe bands are small an endeavour is being made to get a number of these smaller outfits to breed about the same time so that car-load lots can be shipped out co-operatively. On Vancouver Island a programme was commenced this year dealing with definite areas. The Division of Animal Industry endeavoured in these districts to co-operate closely with local organizations in order to place the industry on a sound basis. To begin with, a survey was made of the district in order to ascertain the weaknesses in the present programme. A drive was made on parasitic and other diseases. Flocks were carefully culled and ewes flushed before the breeding season. Rams were turned out practically all at the same time. Again, a docking, dipping, and castrating programme will follow according to schedule.

It is believed, with the large number of lambs being dropped at one time, that car-load lots of well-finished lambs can be secured for shipment to the outside market. A local committee will take care of the selection so as to guarantee only well-finished lambs being marketed. It is expected that as the results of this programme are secured other sections of the Province will be included in similar areas. The practice of attacking the problems of the industry in areas not only gives better results, but is much more economical.

Some breeding projects have been undertaken in the Province and a number of others throughout the Dominion are under close observation. There is now under close observation a small experiment on Vancouver Island, in which a pure-bred Kerry Hill ram is being crossed on pure-bred Shropshire ewes for the production of market-lambs. It is hoped that some of the strong features of both breeds can be incorporated in the progeny. Kerry Hill rams crossed on grade ewes of mixed blood give some particularly fine market-lambs and it is hoped that the cross-bloods will be even more satisfactory.

The wood-tick has caused its usual amount of difficulty and reports have been coming in for some time to the effect that it is travelling farther and farther north in the Province. The blowfly seems to be doing a lot of damage in sections of the range country. Poisonous weeds were very bad this year, perhaps due to the dryness of the early part of the season. Another condition that seems to be on the increase in the Province is the so-called lunger-disease.

Another quite serious difficulty encountered in a section of the range country this year was a type of mastitis in ewes, commonly called "blue-bag." An endeavour to investigate this difficulty and secure control measures has been made. The Kamloops Hospital staff kindly assisted in the preparation of autogenous bacterins prepared from organisms isolated, but the results secured were not satisfactory, and since the work was commenced late in the season it will be necessary to continue it again next year in the hopes that the proper organism or organisms may be isolated and bacterins prepared and held in reserve to deal with emergency outbreaks.

Our lamb-crop percentages in the Province of British Columbia are higher than any of the Western Provinces, but our losses are considerably higher than any of the other Provinces. This is due to such conditions as the wood-tick, the blowfly, lunger-disease, and poisonous weeds, etc.

There was very little movement of Prairie feeder lambs to British Columbia this year. In the past ranchers brought in these lambs, ran them through the winter, and finished them on early grass to be marketed as "breakers" in June.

Entries in the ram classes at the fourth annual Provincial Sheep Show and Sale held at Kamloops in October were of better quality than at past sales. There were no ewes other than some registered Rambouilletts. Range ewes have not sold well at past sales. The market classes contained some good lambs which were disposed of at market prices.

The following table shows prices received at the sale:—

Breed.	No. of Head.	High.	Average.	Total.
Oxfords.....	12	\$30.00	\$18.75	\$225.00
Rambouillet rams.....	3	55.00	49.16	147.50
Rambouillet ewes.....	9	22.50	20.11	181.00
Shropshires.....	12	37.50	22.70	272.50
Cheviot.....	3	30.00	26.66	80.00
Hampshire.....	27	37.50	22.68	612.50
Suffolk.....	1	70.00	70.00	70.00
Romney Marsh.....	8	17.50	12.50	100.00
Lincoln.....	3	10.00	10.00	30.00

This event is assuming considerable importance, both educationally and practically. It teaches the sheepman the proper type required and acts as a clearing-house between the breeder and the rangeman whereby good breeding stock changes hands.

#### SHEEP COMPENSATION.

Compensation under the "Sheep Protection Act" was paid as follows:—

	No. killed.	Amount paid.
Sheep .....	109	\$770.75
Poultry—		
Chickens .....	74	85.75
Turkeys .....	9	36.50
Geese .....	7	17.00
Ducks .....	2	3.00
Totals.....	201	\$913.00

#### NUMBER OF SHEEP IN BRITISH COLUMBIA, 1930-31.

	1930.	1931.
Sheep .....	198,650	204,158

#### RANGE SURVEY.

Realizing that the sheep and cattle men working in the range areas of the Province require certain fundamental information before they can be expected to develop their business on a sound basis, both the Federal and Provincial Departments of Agriculture have undertaken co-operatively to study the situation. This survey was undertaken in June, 1931, and although considerable progress has been made, it is not deemed advisable to make public preliminary report pending the securing of further information on winter-range conditions.

Ranchers are confronted with many problems that seriously affect the production of live stock. Some of these problems are within the control of the rancher, while others are not. The more outstanding of the problems have been listed and their solution is the object of the range survey, to which officials of this Department are lending their support in co-operation with Federal investigators.

#### GOATS.

The continued business depression had an adverse effect on the goat business; in fact, probably more so than on other businesses because of goats being kept principally by working-people. Yet in times like these goats prove their real value in cutting the cost of living by supplying milk, butter, cheese, and meat.

During 1931 the first shipment of goats was made to Nova Scotia, consisting of three bucks and fifteen does, chiefly Saanens. This shipment was only possible through the assistance in freight costs given by the Dominion Government. Otherwise sales have been slow and the Prairie market practically dead.

A world's milk record was made during the year by the Saanen doe "Echo of Deerfield," owned by Miss J. E. Harvey, Cordova Bay, which gave 4,240.6 lb. at first freshening in 365 days, with an average butter-fat test of 4.66 per cent.

## SWINE.

Development in the swine industry for the average farmer seems dependent upon the dairy industry for success. Very few farmers can successfully and profitably raise swine without a dairy by-product, and in view of the fact that a very large part of our dairy industry caters to a whole-milk trade to supply the City of Vancouver, it is likely that we will have to look for any great development in the swine industry to come from other sections of the Province than the Fraser Valley. While we can expect a reasonable amount of development perhaps in the Fraser Valley, this has to be encouraged rather carefully, since such development might conflict with regulations under the "Milk Act." In fact, difficulty in getting some farmers lined up properly under that Act comes as a result of hog-pens being placed too close to milk-houses. These few conditions make it rather difficult to look for great expansion in the swine industry in the Fraser Valley.

The swine industry is showing some development in the Okanagan, Cariboo, and in Northern British Columbia, and more particularly in the Peace River Block. We had this year twenty-two swine clubs with a membership of 249, and reports show quite a large percentage of the club gilts being retained for breeding purposes, and the quality of the club swine in many sections of the Province is the equal of any in Canada. The bacon-litter contests this year numbered three with sixteen entries, and while the number of bacon litters was not high the quality was especially good.

We are suffering from the effects of the great slump in hog prices, which no doubt accounts for the approximate 3,000 decrease in swine population. A year ago the Prairie Provinces found the wheat prices so low that they decided to go into swine-raising, with the result that there was an increase of from 100 to 500 per cent. in the sow population in the Prairie Provinces. With feed-grain worth little or nothing, it is easy to understand how readily they can flood our market and make it next to impossible for British Columbia farmers to compete, especially when the British Columbia farmer has to depend on purchased feed to produce swine. The pig is an animal that, with a limited stomach-space, is forced to live on highly concentrated feeds. These feeds naturally are very expensive, especially when they have to be imported. It is to be expected that the Prairie Provinces will hold a strong place in the field for some little time, but they are certain to return to grain production and will invariably reduce their swine-breeding stock.

This Department has been attempting to interest farmers in swine-raising in sections of the country where home-grown grains and also dairy by-products are available. In developing this programme a number of problems were met. Volume of production was probably one of the serious drawbacks. Farmers in these communities made little or no attempt to organize their breeding programme so that shipments could be made to the Vancouver market. Encouragement is being given to the swinemens to correct this weakness in their programme. In the past they have been dependent on the local buyer. For this trade so-called "shop-hog" was demanded, which required the farmer to market his hogs at a weight of 135 to 140 lb. live weight.

*Swine Prices for 1930-1931.*

1930.			1931.		
Month.	Hogs (Select).	Shop and Heavies.	Month.	Hogs (Select).	Shop and Heavies.
January.....	\$12.50	\$11.60-\$12.00	January.....	\$9.00	\$8.00
February.....	14.00	13.00-13.50	February.....	8.50	7.25
March.....	13.50	12.50	March.....	7.50	6.50
April.....	12.75	12.75	April.....	8.50	7.50
May.....	12.50	11.75	May.....	8.25	7.25
June.....	12.50	11.75	June.....	8.25	7.25
July.....	12.50	12.00	July.....	9.00	7.50
August.....	12.50	11.75	August.....	7.50	6.00
September.....	12.25	11.75	September.....	6.50	5.00
October.....	12.25	11.50	October.....	6.00	5.00
November.....	11.50	10.50	November.....	6.00	4.75
December.....	9.75	8.75	December.....	5.00	4.00

#### DAIRY.

The activities of the Dairy Branch are included in the detailed report of the Dairy Commissioner.

Work in this Branch for the year included the usual assistance in the manufacturing field. The Dairy Branch co-operated very closely with the Live Stock Branch and the Veterinary Branch in the work of dairy-cattle improvement and in the administration of the "Milk Act," and considerable advance is reported. The above three branches worked in very closely this year in an endeavour to lay the foundation for an attack on Bang's disease. Dr. H. E. Young, Provincial Medical Health Officer, and Dr. Hill, of the Bacteriological Department of the University of British Columbia, very kindly assisted in the drafting of this programme. It is believed that this commencement will result in a definite programme for the betterment of both public-health work and the dairy industry.

The work of the Provincial Cow-testing Associations has been continued, with little expansion, however, due to the lack of funds. In all, there are twelve associations with fifteen routes testing regularly over 6,200 cows the year around. With pure-bred cows on test under the Federal R.O.P. system, this means that approximately 6 per cent. of all the dairy cows in British Columbia are on regular test, and while this figure is low it is nevertheless considerably higher than in other Provinces of Canada, where the average is about 1 per cent.

As a result of this work the average yield of butter-fat in the herds of the Province of British Columbia has been steadily increasing. In 1916 the average yield indicated by all completed lactation periods was 6,465 lb. milk and 262 lb. butter-fat. In 1930, with several thousand more animals on test, the average yield indicates 8,015 lb. milk and 336 lb. butter-fat.

In addition to the immediate benefits that result from the exclusion of worthless cows from the herds throughout the Province, there is another development as a result of the background of tested cows created by this work with several thousand daughters, dams, and grand-dams duly recorded as to milk and butter-fat production. The possibility of inquiring closely into the production of the daughters of individual bulls and comparing the yields of these daughters with their dams is now appreciated.

The Dairy Branch for the past two years has been devoting close attention to this work and has now issued a list of pure-bred dairy bulls in British Columbia giving this information in detail. This information should be of the utmost service to both the breeder and the milk-producer in permitting the selection of dairy bulls that will increase production and avoid the customary loss of time in experimentation. The season of 1931 has been one of big production for the dairy industry. There has been an approximate increase of 20 per cent. over that for 1930. A great deal of butter has been made and more cheese than usual. Condensed-milk products have been manufactured to a greater extent than ever before. Unfortunately prices for dairy products are not exceedingly high.

#### VETERINARY.

As a result of close co-operation within the Department, there has been a great financial saving and a decided improvement in the veterinary service rendered.

In the field of tuberculosis eradication there has been a marked improvement. Badly infected herds have been cleaned up and are to-day costing the Department nothing in the way of compensation. The service has been widened out to include other branches of the live-stock industry.

A good deal of work has been done for the industry in the matter of parasitic and other infectious diseases not dealt with by the Federal Health of Animals Branch.

The work of administering the "Milk Act" is becoming more efficient. There was a considerable increase in the number of gradings made by the Veterinary Inspectors and a decided improvement in the methods of milk production throughout the Province.

The Veterinary Branch in their work endeavoured to protect the milk market for the farmer producer by giving such instruction and grading as will ensure no epidemics emanating from any of the farms producing milk for whole-milk consumption. The Veterinary Branch endeavours to keep in mind the needs of the consuming public and the aims of the Medical Health Officers as well. While the work of educating careless or poorly informed producers of raw milk is a work rightly belonging to the municipal inspectors, the officers of this Branch, out of consideration for the dairy industry, has continued to carry on this educational work. In

fact, the time spent by Veterinary Inspectors on educational work is much greater than the time that would be required to simply carry on grading-work as is required under the Act.

Parasitic exhibits have not been featured this year because it was felt that the work had now sufficiently advanced so that any educational work could be continued in the way of district demonstrations on farms in swine-raising centres.

#### POULTRY.

One of the most important pieces of organization-work has been the formation of a Provincial Poultry Board, with the Federal Poultry Promoter, the Provincial Poultry Commissioner, and the Director of Animal Industry as Chairman. The idea in forming this Board was to get the two Departments working upon a definite programme with a full understanding of the work of each group. Advancement has been made in the way of production details.

There were during 1931 in operation ninety-eight Poultry Clubs, with a membership of 712 boys and girls, to whom 9,256 hatching-eggs were sent out.

#### JUNIOR LIVE STOCK CLUBS.

There were twenty-two Swine Clubs, with a membership of 249, with 498 pigs entered. A special endeavour was made to encourage the retaining within the districts for breeding purposes of all young gilts of quality. This endeavour met with marked success, and it is felt that we have perhaps laid the foundation in many communities for some good swine-raising.

There were forty-six Boys' and Girls' Calf Clubs in 1931, as compared with thirty-five clubs in 1930, with a total membership this year of 363.

Through the courtesy of this Department, the Langley Prairie Club team competed at the stock-judging competition held at the Pacific International Live Stock Exposition, Portland, Oregon, fifty-four teams competing, drawn from the following States: Washington, Oregon, Idaho, Utah, and Nevada. The British Columbia team was placed fifth, with 1,975 points out of a possible 2,700 points.

British Columbia, as a member of the Canadian Council on Boys' and Girls' Club work, sent two teams to enter the All-Canadian Competition at the Royal Winter Fair, at which representatives from every Province in Canada competed. Arthur Sladen and Ross McLeod, of Salmon Arm, represented British Columbia in the swine competition, placing fifth with seven teams entered. Bert Tomlinson and Ralph Homefield, of Hazelmere, represented British Columbia in the dairy-cattle-judging competition, placing fifth with eight Provinces competing.

The British Columbia competitors both in swine and cattle made a very respectable showing under the circumstances. Neither team had any great amount of special training, while they competed against teams from other Provinces that had the assistance of special coaches for a considerable time.

This All-Canadian competition proved a wonderful experience for the British Columbia competitors. They learned a great deal regarding live stock and live-stock type. It qualified them to go back into their districts as club leaders and future agricultural leaders. The treatment received from other competitors and people all the way along the line gave the boys a wonderful lesson in sportsmanship.

## NEW PUBLICATIONS.

During the year the Department has issued the following bulletins, pamphlets, circulars, and reports:—

Name.	Description.	No.
Milk and Butter Records, 1930.....	Dairy Circ. 19.....	1,000
Anthracnose .....	Hort. Circ. 45.....	1,000
The Lesser Apple-worm .....	Hort. Circ. 38.....	1,000
Fruit Spray Calendar .....		1,500
Field Crop and Vegetable Spray Calendar.....		1,000
Dust Sprays .....	Hort. Circ. 71.....	1,000
Cereal Smuts .....	Field Crop. Circ. 10.....	1,000
Selection of Orchard Sites and Soils.....	Hort. Circ. 53.....	1,000
Planting Plans and Distances.....	Hort. Circ. 62.....	1,000
Raspberry Culture .....	Hort. Circ. 55.....	2,000
Rhubarb Culture .....	Hort. Circ. 67.....	2,000
Top-working of Fruit-trees .....	Hort. Circ. 42.....	2,000
Varieties of Fruit recommended for Planting.....	Hort. Circ. 64.....	1,000
Cantaloupe-growing in B.C. Dry Belt.....	Hort. Circ. 69.....	1,000
Care and Management of Sheep .....	Bulletin 99 .....	3,000
Practical Poultry-raising .....	Poultry Bulletin 26.....	3,000
Fattening Young Ducks.....	Poultry Circ. 32.....	1,000
Management and Rearing of Guinea-fowls.....	Poultry Circ. 33.....	1,000
Agriculture in Similkameen.....	Agric. Dept. Circ. 43.....	1,000
Some Facts about B.C.....	Agric. Dept. Circ. 44.....	3,000
The Okanagan Valley .....	Agric. Dept. Circ. 40.....	2,000
Farm Account Book .....		2,500
The Farmers' Institutes of B.C. ....	Booklet .....	1,000
Farmers' Institutes By-laws .....		500
Horticultural Rules and Regulations.....		500
Lists of Publications .....		1,000
Climate Report, 1930 .....	Report .....	2,200
Agricultural Statistics Report, 1930 .....	Report .....	1,200
Farmers' Institutes Report, 1930 .....	Report .....	1,000
Twenty-fifth Annual Report .....	Report .....	750
	Total.....	42,150

Bulletins and circulars sent out from the Department during the year totalled 36,935, and in addition there were 67,748 stencilled circulars mailed to farmers and the daily and weekly press. Of these circulars, 24,000 were market news-letters.

## DEPARTMENTAL CHANGES.

The organization of the Department of Agriculture remained practically as was shown in the report for 1930, except for the transfer of the Colonization and Land Settlement Branch to the Department of Lands.

The district offices of the Department at Courtenay and Creston were closed and an Agriculturist was stationed in the Pouce Coupe office, in the Peace River Block, only part time during the year. H. S. French was moved from Courtenay to Prince George as District Agriculturist, succeeding C. C. Kelley, who was given charge of soil-survey work. Miss A. P. Woodward was transferred from Courtenay to New Westminster as stenographer in the district office. C. B. Twigg was transferred from Creston to the Cranbrook office in charge of the combined districts of Creston and East Kootenay. Rodney DeLisle, formerly District Agriculturist at Cranbrook, was temporarily stationed at Pouce Coupe in charge of the Peace River District before being appointed to succeed A. Irving as Plant Quarantine Inspector at Vancouver. H. E. Waby, formerly District Poultry Instructor at Salmon Arm, was appointed District Agriculturist for the territory between Salmon Arm and Golden, including the Upper Arrow Lakes section. James Travis was placed in the Field Crops Branch in Victoria as Field Inspector in place of D. Sutherland, who was stationed in the Peace River District as Weed Inspector.

Superannuations, resignations, and retirements included W. J. Sheppard, Provincial Apiarist; David Mackereth, Carpenter; H. Gutteridge and A. Irving, Plant Quarantine Inspectors; Miss M. E. Lauder and Miss E. McQuaide, Stenographers; and James Allen, District Poultry Instructor.

One year's leave of absence without pay was allowed J. L. Webster, Assistant Agriculturist at Penticton, and extended sick-leave was granted W. J. Bonavia, Executive Assistant, and Dr. W. W. Alton, Veterinary Inspector.

The only addition to the permanent staff of the Department of Agriculture was W. de Macedo, M.Sc., Plant Quarantine Inspector.

#### MASTER-FARMERS.

The master-farmer movement was this year extended by the Nor'-West Farmer Publishing Company, which sponsored the scheme, to include British Columbia. Two farmers were selected from among the nominees to receive certificates and medals designating them as master-farmers. They were Mr. Leonard F. Solly, of Westholme, Vancouver Island, and Mr. John Mole, of Ladner, B.C. Both of these farmers made creditable scores and were selected by the Committee of Awards as worthy of being known as master-farmers. The foreword to the master-farmer announcement for 1931 by the Honourable Premier S. F. Tolmie is reproduced below:—

“A solid dignity attaches to the master-craftsman in any legitimate line of human activity, and surely that dignity is enhanced in the case of the master-farmer, past master in ‘the first and most respectable of all the arts.’

“Probably no single movement has done more to advance the cause of scientific husbandry than the master-farmer movement, which may truly be said to open a new chapter in Canadian agriculture.

“Since its introduction into Canada in June, 1929, by ‘The Nor'-West Farmer,’ a widespread interest has been aroused, and both press and public have come to a livelier appreciation of the results to be achieved by intelligent application of farming's governing principles. Industry goes far and accomplishes much, but industry alone will not make the man a master of his craft. Intelligence, foresight, sound judgment, and skilful planning are as essential to success in farming as in any other branch of commercial or industrial enterprise; and the man who wins recognition in that particular sphere deserves respect as the builder with his own hands of the edifice of a life well spent.

“It is extremely gratifying to find two of British Columbia's farmers in the master group for 1931, and warm congratulations are extended to all master-farmers, not alone for their excellence as farmers, but for the integrity of character and sterling citizenship which have their part in the award.

“When it is borne in mind that the title of ‘master-farmer’ is not won in competition, that it is conferred only upon men selected by their friends or neighbours for outstanding merit and ability, that it comes only to men who have applied themselves diligently to farming as a chosen profession, one begins to realize what it means to those upon whom the accolade has fallen.

“I am myself a son of the soil, born and bred upon the farm, with an intimate knowledge which enables me very fully to appreciate the enterprise and skill and tireless industry of the man who achieves the distinction of master-farmer.

“British Columbia's agricultural potentialities are well known. We lead the Dominion in our average production per farm and in the value per acre of our farms and orchards. Of all our farms, 90 per cent. are owned by the farmers. One of the most gratifying aspects of the situation in this Province is the increase in dairy-farming and dairy production, which shows it to be ideally suitable for development on these lines. In fact, there is no reason why Canada should not aspire to world-leadership in dairy produce. In that ambition the master-farmer movement becomes a vital factor. The successes of the master-farmers furnish incentive to farmers in every portion of Canada so to conduct their farms, and so to order their lives and contacts with their fellows, that they in turn may become acknowledged leaders, to share their knowledge and impart their wisdom and their skill. In effecting a general improvement in farming methods and practices, in emphasizing the status of farming as one of the foremost of the world's activities, the master-farmers of Canada are performing a noble task and rendering a high service to humanity.”

All of which is respectfully submitted.

WM. ATKINSON,  
*Minister of Agriculture.*

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