PROVINCE OF BRITISH COLUMBIA

Department of Agriculture

FIFTY-SEVENTH

ANNUAL REPORT

1962

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1963

To Major-General the Honourable GEORGE RANDOLPH PEARKES,
V.C., P.C., C.B., D.S.O., M.C.,
Lieutenant-Governor of the Province of British Columbia.

MAY IT PLEASE YOUR HONOUR:

I have the honour to submit for your consideration the Annual Report of the Department of Agriculture for the year 1962.

FRANK RICHTER,
Minister of Agriculture.

Department of Agriculture,
Victoria, B.C.

BRITISH COLUMBIA DEPARTMENT OF AGRICULTURE

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Honourable FRANK RICHTER

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Miss M. JEWELL

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WM. MACGILLIVRAY

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J. A. SMITH, B.S.A., Supervising Horticulturist, Kelowna.
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J. CORNER, Provincial Apiarist, Courthouse, Vernon.

Plant Pathology:

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Live Stock:

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J. C. BANKIER, B.V.Sc., Veterinary Inspector and Animal Pathologist, Vancouver.
J. A. MACE, Superintendent, Dairy Herd Improvement Association, Victoria.

Live Stock—Continued

T. MOORE, Recorder of Animal Brands, Victoria.
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T. J. BATTEN, Brand Inspector, Kamloops.
W. H. BURR, Dairy Farm Inspector, Abbotsford.
Miss G. K. CHOW, B.Sc., Bacteriologist, Vancouver.
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J. J. COMLEY, Dairy Farm Inspector, Vernon.
C. C. CUNNINGHAM, B.S.A., D.V.M., V.S., Veterinary Inspector, Nelson.
A. J. DUCK, Brand Inspector, Kamloops.
K. G. FLETCHER, Dairy Farm Inspector, Abbotsford.
J. R. HANNAM, Inspector, Dairy Herd Improvement Association, Chilliwack.
H. JOHNSON, Inspector, Dairy Herd Improvement Association, Abbotsford.
A. L. KIRKBY, Dairy Farm Inspector, Nanaimo.
R. L. LANCASTER, D.V.M., V.S., Veterinary Inspector, Abbotsford.
E. V. LANGFORD, D.V.M., V.S., D.V.P.H., Veterinary Inspector and Animal Pathologist, Vancouver.
P. G. LAWRENCE, Inspector, Vancouver.
Mrs. A. B. MAH, B.Sc., Bacteriologist, Vancouver.
S. MUNRO, Deputy Brand Inspector, Clinton.
J. MUSTARD, D.V.M., V.S., Veterinary Inspector, New Westminster.
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R. PIGEON, Brand Inspector, Williams Lake.
B. R. STEWART, Dairy Farm Inspector, Chilliwack.
K. H. THOMPSON, D.V.M., V.S., Veterinary Inspector, Prince George.

Dairy:

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D. M. HAMILTON, B.S.A., Poultry Inspector, Nanaimo.
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H. CROCKARD, Potato Specialist, Vancouver.
E. C. HUGHES, B.S.A., Assistant in Field Crops, New Westminster.
J. H. NEUFELD, B.S.A., Soil Analyst, Victoria.

Farmers' Institutes:

L. W. JOHNSON, Superintendent, Victoria.

Soil Survey:

C. C. KELLEY, B.S.A., Senior Soil Surveyor, Kelowna.
C. H. BROWNLEE, B.S.A., Soil Surveyor, Kelowna.
A. B. DAWSON, B.A., B.S.A., Assistant Soil Surveyor, Kelowna.
M. G. DRIEHUYZEN, B.S.A., Extension Soil Surveyor, Cloverdale.
M. K. JOHN, B.S.A., M.Sc., Ph.D., Assistant Soil Surveyor, Kelowna.
V. E. OSBORNE, B.S.A., M.Sc., Assistant Soil Surveyor, Kelowna.
G. G. RUNKA, B.S.A., Soil Surveyor, Kelowna.
P. N. SPROUT, B.S.A., Soil Surveyor, Kelowna.

Agricultural Development and Extension:

G. L. LANDON, B.S.A., Director.
J. S. ALLIN, B.S.A., Supervising Agriculturist, Victoria.
G. L. LUYAT, B.S.A., Supervising Agriculturist, Kamloops.
S. G. PRESTON, B.S.A., M.S.A., Supervising Agriculturist, Prince George.
A. J. ALLAN, B.S.A., District Agriculturist, Dawson Creek.
J. W. AWMACK, B.S.A., District Agriculturist, Cranbrook.
H. BARBER, Accountant, Land Clearing Division, Victoria.
G. L. CALVER, B.A.Sc., Extension Agriculturist Engineer, Victoria.
J. F. CARMICHAEL, B.Sc., M.Sc., District Agriculturist, Grand Forks.
G. CRUICKSHANK, B.S.A., District Agriculturist, Chilliwack.
A. E. DONALD, B.S.A., District Agriculturist, Prince George.
P. E. EWERT, B.S.A., District Agriculturist, Mission.
R. C. FRY, B.S.A., District Agriculturist, Quesnel.
J. E. HALL, B.Sc., District Agriculturist, Abbotsford.
J. D. HAZLETTE, B.S.A., District Agriculturist, Salmon Arm.
K. R. JAMESON, B.S.A., District Agriculturist, Duncan.
Miss LORNA MICHAEL, B.Sc.(H.Ec.), Home Economist, Victoria.
G. A. MUIRHEAD, B.S.A., District Agriculturist, Cloverdale.
K. E. MAY, B.S.A., Assistant Extension Agricultural Engineer, Vernon.
J. A. PELTER, B.S.A., District Agriculturist, Smithers.
S. B. PETERSON, B.S.A., Supervisor, 4-H Clubs, Victoria.
J. E. PIERCY, B.S.A., District Agriculturist, Fort St. John.
J. C. RYDER, B.S.A., District Agriculturist, Vernon.
E. M. SODER, B.S.A., Assistant District Agriculturist, Kamloops.
T. A. WINDT, B.S.A., Assistant Extension Agricultural Engineer, Abbotsford.

Land Settlement Board:

Chairman: WM. MACGILLIVRAY, Deputy Minister of Agriculture, Victoria.
Director: G. L. LANDON, Director, Agricultural Development and Extension, Victoria.
Director: L. W. JOHNSON, Superintendent of Farmers' Institutes, Victoria.
Secretary: Miss C. STEPHENSON, Victoria.

Dyking Commissioner and Inspector of Dykes:

W. R. MEIGHEN, B.Sc., New Westminster.

Deputy Dyking Commissioner:

W. S. JACKSON, B.A.Sc., New Westminster.

Southern Okanagan Lands Project:

F. O. MCDONALD, Project Manager, Oliver.

Institutional Farms:

W. B. RICHARDSON, B.S.A., Superintendent, Essondale.
D. F. CALDOW, Farm Foreman, Essondale.
P. CUMMINS, Farm Foreman, Colquitz.
L. KING, Farm Foreman, Tranquille.

Milk Board:

E. C. CARR, Chairman, Vancouver.
W. J. ANDERSON, B.S.A., M.Sc., Ph.D., Member, Vancouver.
J. D. HONEYMAN, Member, Ladner.
G. T. BELL, Chief Clerk, Vancouver.
G. CROTHERS, Inspector, Kelowna.
E. D. DAUM, Accountant, Vancouver.
R. E. D'EASUM, Inspector, Vancouver.
A. S. DIXON, Inspector, Nanaimo.
J. W. MCINTOSH, Inspector, Vancouver.

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Report of the Department of Agriculture

REPORT OF THE DEPUTY MINISTER OF AGRICULTURE

The Honourable Frank Richter,
Minister of Agriculture, Victoria, B.C.

SIR,—I have the honour to present herewith the Fifty-seventh Annual Report of the Department of Agriculture for the year ended December 31, 1962.

The Report comprises a summary of agricultural conditions and a brief review of the performance of all branches and divisions of the Department during the year. As is customary, detailed information is omitted but is on file and available for reference purposes.

The release this year of the findings of the 1961 Census of Canada has done much to clarify the agricultural picture, and thereby to make possible a better understanding of the changes that have occurred and the trends that are developing. An example is found in the enumeration of farms, in which a farm is now defined as a holding of 1 acre or larger from which sales of farm products valued at $50 or more were made during the preceding twelve months. Previously a farm was defined as a holding of 3 acres or larger, or a holding of 1 to 3 acres having a production valued at $250 or more. Further, a new category in which all farms reporting sales of agricultural products valued at $1,200 or more are henceforth to be classed as commercial was introduced. Under this change in classification, British Columbia lost 4,012 farm units that would have been included in the Provincial total had the definition as applied in the 1951 Census been retained.

In the ten-year period 1951 to 1961 there was a decline in the total number of farm holdings from 26,406 to 19,934 units, while those qualifying as commercial farms decreased by 1,000 units to 10,902. These later figures, together with the revised definitions, bring into focus a truer picture of actual agricultural conditions and indicate, when related to such factors as productions and cash returns, that agriculture in this Province is in a relatively healthy state.

This is borne out by the figure for total cash income from the sale of farm products, which reached a new all-time high in 1962. In spite of unseasonably cool, unsettled weather during much of the growing season, total production was well maintained, and depressed returns for some items were more than offset by firm prices for others. Contributing substantially to the latter were higher returns realized for grains, live stock, and some fruits.

For the most part, developments in agriculture during the year were related to continuing trends that have been in evidence for some time. An example of this is found in the recent reports of the Dairy Herd Improvement Services, which show that the average size of herds on test today stands at 35 cows, whereas ten years ago the average was 22. This is a direct reflection of the trend toward fewer but larger dairy-farm operations. This same trend has been evident in virtually all lines of agriculture.

Similarly, advances made as a result of research findings are not as a rule identifiable with any given calendar year. Instead, they are of a continuing nature and may only achieve significance when results of a series of trials are compared. Tests

conducted on broiler chickens in this Province during 1962, for example, showed that birds can now be brought to a weight of 3.67 pounds in eight weeks with a feed conversion factor of 2.1 pounds. Similar tests carried out in the 1958/59 period proved that birds could be turned out at 3.41 pounds after ten weeks with a feed conversion of 2.49 pounds. This gain in efficiency is unmatched in Canada and augurs well for the future of the broiler-chicken industry in British Columbia.

The interpreting of such findings into practical application at the farm level continues to be a primary function of this Department, and many of our policies are shaped to that end.

The various branches directly concerned with extension activities continued to develop new methods of instruction and enlarge upon established practices. Particular emphasis was again placed upon field-days where improved technology in all types of husbandry could be readily demonstrated. Coupled with these were short courses designed to illustrate and explain the latest developments on the farm front. Rounding out the over-all programme were a number of field trials and applied research projects, some of which were carried out in co-operation with the Canada Department of Agriculture and the University of British Columbia.

Typical of the new techniques employed to convey useful information to the primary producer was the expansion, this year, of the televised series of instructional papers and interviews in the Interior. As conditions permit, increased use of television as an educational medium will be made.

The Plant Pathology Branch reported serious outbreaks of botrytis in beans and strawberries and the occurrence of pear trellis rust, all in the Fraser Valley. The last named was the first reported outbreak on the mainland of North America. Eradication work is under way.

No major insect outbreaks were reported by the Entomology Branch this year, but work was continued on the programme of eradication of the warble fly in live stock. Encouraging results from efforts to eradicate grape phylloxera in the Okanagan Valley were also reported.

Also encouraging were results on pollination trials on apple-trees, conducted in co-operation with the Apiary Branch. Significant gains in apple production were achieved by this means.

The Live Stock Branch reported further progress in the long-range programme aimed at stamping out brucellosis in the cattle population, with every indication that the entire Province will be declared free of this disease shortly.

The South Okanagan Health Unit was officially approved as a milk pasteurization area under provisions of the *Milk Industry Act,* to become the first area in the Province to be so designated.

Introductory work on classification of land for forestry, in addition to its regular soil-survey projects, was carried out this year by the Soil Survey Branch.

Over 8,000 acres were cleared and 6,000 broken this year under provisions of the *Farmers' Land-clearing Assistance Act.* In the sixteen years since this Act was introduced, work costing over $4,000,000 has been carried out in clearing approximately 106,000 acres and breaking 40,000 acres of new land and constructing water dugouts and drainage systems.

LEGISLATION

The *Agricultural Rehabilitation and Development (British Columbia) Act* was passed during the 1962 Session of the Legislature. As implied by its title, this Act provides authority for the undertaking of rural rehabilitation and conservation measures. A general agreement providing for joint action in this respect with the Government of Canada under similar Federal legislation was also signed during the year.

Also enacted were the *Dyking Assessments Adjustment Act* and the *Live-stock Public Sales Act*. The latter makes provision for the licensing of live-stock sales yards, and the licensing and bonding of operators, auctioneers, and those dealers not covered by terms of the *Stock Brands Act*. Minor amendments were made to the *Animals Act, Milk Industry Act, Plant Protection Act, Pound District Act,* and *Trespass Act*.

APPOINTMENTS

M. K. John, B.Sc., M.Sc., Ph.D., Agriculturist, January 22nd.
S. B. Peterson, B.S.A., Supervisor, 4-H Clubs, May 1st.
J. V. Zacharias, B.S.A., Agriculturist, May 22nd.
T. R. B. Barr, D.V.M., Animal Pathologist, June 1st.
J. C. Taylor, B.S.A., Agriculturist, June 4th.
E. B. MacDonald, B.S.A., Agriculturist, June 6th.
J. B. Clapp, D.V.M., V.S., Veterinary Inspector, July 1st.
R. L. Wilkinson, B.S.A., Assistant Live Stock Commissioner, September 1st.

SUPERANNUATION

I. Spielmans, Inspector, Land Settlement Board, July 31st.

W. MacGILLIVRAY,
Deputy Minister of Agriculture.

AGRICULTURAL DEVELOPMENT AND EXTENSION BRANCH

G. L. LANDON, B.S.A., DIRECTOR

EXTENSION ACTIVITIES

With an increase in population in the Province the volume of work performed by the Agricultural Development and Extension staff continues to expand each year; this includes an increasing number of contacts with people in urban areas. Revised methods and techniques must be used since many areas in the Province require programmes adapted to part-time farming. There is also an increasing need for specialists in many fields to carry on an effective programme in all areas of the Province.

LOWER MAINLAND AND VANCOUVER ISLAND

As an alternative to dairying, more and more farmers are turning to veal and beef production in this area. High beef prices, coupled with an optimistic outlook, are resulting in a definite increase in feeder operations in this area. Farm forestry is receiving considerable attention in this area, particularly on the north side of the Fraser River, and some co-operative research is being undertaken by our extension staff.

PEACE RIVER, CENTRAL BRITISH COLUMBIA, AND CARIBOO REGION

A comprehensive study of a beef-sheep programme has been undertaken in this area, and a live-stock organization was established in the Burns Lake area. Increased interest is being shown in both beef and sheep from Terrace to McBride.

SOUTHERN INTERIOR AND KOOTENAY REGION

Due to specialized nature of the agriculture in this area, the emphasis is varied in each district, depending upon whether production is keyed to dairying, beef cattle, vegetables, or mixed farming. A marked increase in beef production is evident in the entire area from Kamloops to East Kootenay.

REGIONAL CONFERENCES AND SHORT COURSES

Very good regional conferences of extension staff and specialists were held in Prince George in April and November and at Chilliwack and Duncan in April and October. These are proving very effective as short-term in-service training sessions. Several staff members attended the short courses on sheep and beef at Kamloops, seed production in the Peace River, and swine at Saanichton.

LIVE STOCK

The great interest in beef-cattle production is considered due mainly to the dollar discount on Canadian funds and resulting United States demand for Canadian feeder cattle. There is also an increasing demand from Ontario and British Columbia for feeder cattle from Western Canada.

Because of good prices for grain, cattle-finishing is not making any great progress in the Peace River area.

BEEF CATTLE ADVISORY COMMITTEE

Four meetings of this Committee were held during the year. Seven sub-committees were in operation—Cattle Identification, Range Management, Tranquille Farm, Cattle Finishing and Marketing, Progeny Testing, Publicity Advisory to the Minister, and Live Cattle-Carcass Display. Considerable time was spent in making an analysis of the report on "The Economic Survey of Cattle Ranching in the Interior of B.C.," by E. D. Woodward, and a survey was made by the Committee of the possibilities offered by the Tranquille Farm toward contributing answers to some of the general live-stock problems. In the cattle-finishing field the main project was formulating an approach to the finishing of beef cattle on farms in the Lower Fraser Valley in lieu of surplus production of milk at manufacture prices.

SHEEP INDUSTRY

There is a sustained interest in sheep in British Columbia despite the uncertain market. Prices showed marked improvement early in the summer over those of 1961, but quickly declined as shipments were received from the range bands. All alpine ranges lying within the Kamloops district were put to full use this year for the first time in the history of the sheep industry. Very unseasonable weather in July made grazing at the high levels very poor. Predators, mainly grizzly bear, made disastrous invasions on all mountain ranges, even in areas which formerly had been comparatively free of this kind of a problem. Losses were quite heavy.

McBRIDE-DUNSTER GRAZING ASSOCIATION

This association, made up of five owners with 1,250 head, pioneered, for the first time, grazing in the foothills of the Rockies north-east of Dunster. Herder and grizzly bear troubles made the venture difficult, but this is not unusual with the first entry into a new range to which sheep are not accustomed. Despite the shortness of the season away from the steads the growth recovery on the home pastures was phenomenal, serving as fall pastures and thereby pushing winter feeding into a shorter period.

LAMB-GRADING

Assistance was given in grading the first truck and trailer shipment of lambs from the Prince George area. Some sheepmen arrived to the collection point with their lambs well selected for finish and weight, while others did just the opposite. The requirements of the market were demonstrated, and resulted in an improvement in selection in the second shipment.

SHEEP FIELD-DAYS

Three sheep field-days were held in the Interior in 1962—at Dawson Creek, Prince George, and Westwold. At all three field-days the carcass demonstrations displayed some surprising results when related to that of live grading, indicating that the degree of finish was very often under-assessed in live lambs.

R.O.P. FOR SHEEP

Early in the year an R.O.P. programme was initiated in the McBride-Dunster area using a simple system of identification of matching ewes and lambs by ear-tags with numbers designed to permit the culling-out of unprofitable ewes and more intelligent selection of replacement ewe lambs.

AGRICULTURAL ENGINEERING DIVISION

(G. L. Calver, B.A.Sc., P.Eng., Senior Agricultural Engineer)

During the year the operation of the Division was changed by the establishment of two district offices, with Mr. K. E. May located at Vernon and Mr. T. A. Windt at Abbotsford. Six students were hired during the summer to assist with the work under the land-clearing assistance programme and demonstration work carried out by the Division.

POWER AND MACHINERY

Projects

1. *Potato-sprayer.*—The potato-sprayer developed over the past four years by the Division in conjunction with the Agricultural Engineering Department at the University of British Columbia was retested this year. A review of results indicates that the unit is satisfactory for economic control of aphids, flea beetles, and late blight in crops. Expansion of the use of the principles incorporated in this unit is assured due to the interest of one large sprayer-manufacturer in the use of this information in their sprayer-development programme.

A second portion of this trial dealt with the development of tractor wheel-guards for tractors used in sprayer operations. Modifications carried out to date have not resulted in a completely effective unit.

2. *Mechanical Feeding of Silage.*—With the trend toward increased mechanization of choring activities in the farmyard, some emphasis has been placed on mechanical feeding equipment, with two units being investigated:—

(*a*) *Conveyor Chain Feeder.*—The feeder employs the principle of an endless chain with specially designed cross-flights to distribute silage evenly on a feed bunk. The modified unit has been field-tested for half of one season and works effectively.

(*b*) *Tractor Front-end Silage Fork.*—A tractor-mounted front-end loader, with grapple fork, was tested and demonstrated to show its use for silage-feeding operations from a bunker silo. The unit has proven effective and is set up as a continuing demonstration with working plans available from district offices.

3. *Forage-harvesting Machinery Study.*—A questionnaire-type study has been set up in co-operation with the Economics Division of the Canada Department of Agriculture to review equipment and costs encountered in forage-harvesting. It is anticipated that the results of this study, when analysed, will indicate costs, trends, and problems.

4. *Hay-drying.*—A diesel-powered fan which utilizes the waste heat from the engine to heat the drying air has been given a partial year's test for hay-drying in the Lower Fraser Valley. Results achieved to date indicate the value of continuing this test.

5. *Committee to Study Fruit-handling Equipment.*—A detailed report on the results determined by this committee from their investigations in the season of 1961 was published, and 1,000 copies distributed on request. Results indicated further investigation was required to reduce damage at picking and in portions of the packing-line. Therefore, experimental work is being carried out on picking-bags, dumpers, packing-tubs, and bin-fillers. A paper was prepared and presented to the Pacific Northwest Section of the American Society of Agricultural Engineers.

Tractor-maintenance Courses

Five tractor-maintenance courses were held in the south-east portion of the Province, with attendance of sixty-two persons.

In addition, welding courses were arranged at two centres in co-operation with a welding-supply company and local interests.

Publications

A new bulletin, " Tractor Service Manuals," A.E. 13, was prepared and distributed, and a bulletin, " Potato Spraying Equipment," A.E. 10, to be revised, effective 1962.

A report of committee activities during 1961 by the Committee to Study Fruit Handling Equipment is also available.

A plan showing the recommended shapes and placement of teeth for land-clearing blades has been prepared.

Meetings and Field-days

Two machinery field-days were attended, and information on various farm equipment presented at three meetings.

Soil and Water

Drainage Projects

1. *Tile Covering.*—Problems with concrete sediment-boxes were encountered in the tile-covering demonstration under way. These boxes were replaced with plywood and metal collection boxes. To date all coverings tried are working effectively in the elimination of silt from the drain-lines.

2. *Fibreglass Placement.*—Tests indicate that light fibreglass sheeting is effective in controlling sedimentation of tile-lines. Special reels were developed for automatic placement of this material on a further demonstration to assess the effectiveness of the material for flow sands.

3. *Pervious Back-fill.*—Plans were drawn up and a slipform constructed to permit placement of a 6-inch width of gravel in a 16-inch-wide trench, where gravel back-fill is recommended due to extremely heavy soils. Tests were encouraging, but emphasized the need to carry out work under dry ground conditions.

4. *Pump Tests.*—Delivery rates and efficiencies of a number of pumps presently in use have been checked. The low efficiencies recorded indicate the need for improvement in small pumps for farm drainage and further test work to assess the best methods of installation.

5. *Drainage Coefficients.*—All preliminary work to establish a demonstration to check drainage coefficients in the western portion of the Lower Fraser Valley have been completed. Demonstration will be carried out on the Canada Department of Agriculture substation at Ladner. Advisory assistance will be obtained from the Agricultural Engineering Department at the University of British Columbia and assistance in collection of rainfall information from the Department of National Defence and the Department of Transport of the Federal Government. It is proposed that the site will also be used to check devices for ditch-flow measurement, further pump studies, and volumes of discharge from submerged outlets.

Design of Drainage Systems

Topographical surveys have been carried out on the major portions of thirty-three farms and cover 1,164 acres. Complete drainage systems have been designed for thirty-one of these farms, covering 1,098 acres. Installation of tile has lagged somewhat behind the survey work, but was moving ahead at a fairly steady rate in

the late fall. Seven other surveys and preliminary investigations were carried out on drainage requests.

In addition to the survey and planning work completed, talks on drainage were presented to three meetings.

Irrigation

The Departmental irrigation equipment located at Vanderhoof was once again used on cash crops. The expansion of the use of this practice is extremely slow in the demonstration area.

Detailed system designs were prepared for four farms, covering 385 acres. In addition, partial design information and advisory assistance was provided to eighteen individuals, with information on the development of water supplies for irrigation provided for six additional queries.

The Division, in conjunction with the Lower Mainland Advisory Subcommittee on Agricultural Engineering, organized an irrigation workshop, which brought together information on the latest developments in irrigation, including equipment, moisture measurement, system design, and irrigation scheduling. Papers were presented on a wide variety of subjects as a basis for discussion periods.

A Federally sponsored irrigation round-up at Lethbridge was attended, and the extension of information on irrigation equipment and use was presented to two farm groups.

The A.S.A.E. Recommendations for the Minimum Requirements for the Design, Installation and Performance of Sprinkler Irrigation Equipment have been printed as Bulletin A.E. 20, and is available for distribution.

Soil Conservation

Information on terrace construction for soil conservation was presented to one meeting, and a review is under way covering the major erosion problems on the Slocan River.

Domestic Water

A detailed report has been prepared on the Canyon Creek water system. Other work includes advisory assistance on eight domestic water systems. Under the *Farmers' Land-clearing Assistance Act,* assistance has been provided with the construction of a number of dugouts for domestic water.

Farm Structures

Potato-storage Ventilation

The fan ducts and controls installed in the potato ventilation demonstration project have indicated that accurate control of temperatures within a very narrow temperature range is possible. However, shrinkage losses observed to date indicate that further work may be necessary in assessing the best flow rates to keep shrinkage to a minimum.

Plan Service

The development of new plans for distribution is primarily the responsibility of the Canadian Farm Building Plan Service; however, Provincial departments are accepting more responsibility in supplying material for the revision of these plans by catalogues. This Division's contribution to the revision of the dairy-housing plans has been the preparation of three plans on manure disposal, including the recent interest in liquid-manure disposal. The Division is chairing the sub-committee to review buildings and equipment in the fruit and vegetable catalogue, and

employed two students during the summer to revise and prepare plans for this catalogue revision. Detailed work was carried out on twenty-four plans. The material was then reviewed by the full committee, with the majority of material now being passed to the draughting centre at Guelph for final rework. The finalized plans for this series should be available within eighteen months. On an interim basis, the plans which have been prepared will be available through the Department. These include plans for apple storage and refrigeration, peach storage, vegetable storage (potato, carrot, turnip, beet), onions, together with a variety of equipment.

Other plans which have been prepared by the Division include a bulb-dipping tank; goat-housing plans and fair building for goats, together with four specific building layouts, primarily dairy structures; and seven farmstead plans.

Total plan distribution for the year was 4,308 plan sets.

Building Standards

A contribution to the Farm Buildings Standards Sub-committee of the Associate Committee on the National Building Code has consisted of the preparation of a set of structural considerations, in the design of buildings, which must be observed to meet health and sanitation regulations.

Rural Electrification

The Bibliography on Rural Electrification Publications has been revised, and a mimeographed brochure prepared on Development of Electrical Energy from Small Water Sources.

Farm Safety

Activity in this field has been extremely limited, with only one meeting being attended, and the balance of the effort dealing with answers to letters of inquiry.

Land Clearing and Development

From 1946 to March 31, 1962, work in the amount of $4,150,991.55 has been carried out for farmers on 7,951 accounts. The accounts receivable book balance at that date was $887,334.41.

Work completed to the above date includes 105,800 acres cleared, 40,300 acres broken, 960 acres drained, 99 dugouts for domestic water, and other minor work consisting of road construction, fence-lines, and land-levelling.

Up to November 30th of the 1962 operating year 8,041 acres were cleared and 5,913 acres broken. The expenditure during the year to the time stated was approximately $357,000, of which 45 per cent of the expenditure was in the Peace River, which accounted for 65 per cent of the cleared acreage and 80 per cent of the acreage broken.

The finalized figures for the fiscal year 1961/62 show 10,300 acres cleared and 4,865 acres broken.

Duirng 1962 private contractors were utilized to carry out all work. Retendering was carried out in the following areas: North Vancouver Island, South Vancouver Island, Fraser Valley, Salmon Arm, Creston, Prince George, South Peace River, and North Peace River (twice).

In all other areas existing contractors were reapproved when equipment inspection showed it to be satisfactory. Approval was granted to seventy-eight contractors, who operated eighty-nine crawler tractors, nine scrapers, ten mouldboard plough breakers, twenty-two disk breakers, fourteen backhoes, thirteen drag-lines, three grade-alls, three wheel-type trenchers, and one well-drilling rig. The equipment and work of all contractors were reviewed at least once during the season.

Summary of Land Clearing and Development

District	1946 to Mar. 31, 1962 (Approximate Acres)		1961/62 Fiscal Year					
			Clearing				Breaking	
	Cleared	Broken	Number of Acres	Average Cost per Acre	High	Low	Acres Broken	Average Cost per Acre
Peace River North	20,500	11,500	2,570	$16.50	$21.90	$12.00	1,116	$9.60
Peace River South	18,500	12,000	3,213	18.65	24.75	13.00	2,003	8.90
Prince George	11,000	7,000	489	33.40	40.70	25.00	308	8.65
McBride	2,800	2,000	345	42.80	68.00	37.00	223	8.50
Vanderhoof	6,000	2,500	815	15.40	21.60	11.00	417	8.70
Smithers	3,000	900	216	34.00	37.00	22.00	68	11.80
Terrace	500	200	36	87.00	111.00	77.00	.....	.....
Quesnel	4,800	3,000	810	29.20	50.00	25.00	377	7.90
Williams Lake	3,500	600	31	45.00	49.00	35.00	.....	9.40
Kamloops area	9,000	500	675	47.80	61.50	33.00	322	8.20
Okanagan	8,000	N.A.	260	61.00	83.00	46.00	.....	.....
Kootenays	5,600	N.A.	120	68.50	96.00	53.00	14	13.40
Lower Mainland	6,800	N.A.	520	112.00	142.00	88.00	.....	.....
Pemberton	1,000	100	60	65.50	106.00	52.00	17	11.25
Vancouver Island	4,800	N.A.	140	115.00	206.80	78.00	.....	.....
Totals	105,800	40,300	10,300	.....	.....	.....	4,865	.....

N.A. under "Broken" indicates that the methods used in clearing do not require the utilization of heavy breaking equipment for the clearing also in effect breaks the land.

4-H CLUB DIVISION

(S. B. Peterson, B.S.A., Supervisor)

Enrolments

Club membership remained essentially the same in 1962 as in 1961. There were, however, sixteen new clubs organized, to bring their number to a new high of 279. Girls outnumbered boys in club work and will continue to increase proportionately as Home Arts Clubs materialize. Club numbers and membership at the end of the year was as follows:—

Number of clubs		279
Number of boys	1,592	
Number of girls	1,648	
Total members		3,240

Membership Statistics

It is interesting to note the number of members within the various age-groups from 10 to 21 years and the percentage each comprises of the total, as follows:—

Age	Members	Per Cent
10 years	391	12.6
11 ,,	490	15.1
12 ,,	519	16.0
13 ,,	462	14.2
14 ,,	502	15.5
15 ,,	392	11.7
16 ,,	248	7.6
17 ,,	155	4.8

Age	Members	Per Cent
18 years	35	1.08
19 ,,	26	0.8
20 ,,	19	0.6
21 ,,	1	-------

The average age of club members was 13.1 years. This figure compares closely with the National average age of 13.8 years reported by the Canadian Council in 1961.

One of the most useful yardsticks to gauge the trend of membership lies in the numbers of years that a youngster stays in club work, as shown below:—

Years	Members	Per Cent
One	1,112	34.3
Two	810	25.0
Three	511	15.8
Four	345	10.7
Five	224	6.9
Six	123	3.9
Seven	61	1.9
Eight	35	1.09
Nine	14	0.04
Ten	5	-------

From this table it is evident that 59 per cent of all members have less than two years' experience in club work.

It is expected that the new expanded programme will affect these data within the next two or three years. It is hoped that two things will happen: (1) more members will remain longer in club work; (2) the average age will be raised above 13.1 years.

Project Work

A breakdown of membership into the various project enterprises indicates the extent of types of 4-H activity. The resulting production from projects is represented in the final column as reported by club leaders.

Project	Clubs	Members	Membership Percentage of Total	Productivity
Beef	44	485	15.0	562 steers and heifers.
Dairy	80	934	28.9	925 calves, 253 yearlings.
Community	25	403	12.4	Included in respective projects.
Garden	18	219	6.8	277 gardens.
Goat	4	46	1.4	53 goats.
Grain	3	27	0.8	54 acres.
Honeybee	6	50	1.5	156 hives.
Poultry	8	109	3.4	3,485 birds.
Rabbits	5	52	1.6	73 does and litters.
Sheep	15	160	4.9	293 lambs and ewes.
Swine	9	75	2.3	156 hogs.
Tractor	6	50	1.5	46 tractors.
Home Arts	56	630	19.4	482 garments, 984 other articles.

Club Activities

It is quite impossible to recount all the many 4-H activities that were organized by local agricultural offices in co-operation with their District Councils. Virtually all districts staged special 4-H events of one kind or another. Several districts

organized field-days and rallies with outstanding success in programme content and participation by district members.

Provincial 4-H Club Week

It was found necessary this year to move the location of Provincial 4-H Club Week from Tranquille to New Denver. While certain difficulties were encountered in effecting this change, the advantages attained did much to bring success to the week's programme. Particular emphasis was laid on such subjects as farm and home planning, debating, junior leadership, news-writing, and the construction of educational displays.

At the close of Club Week, final selections were made for the following awards:—

(1) Canadian National Exhibition scholarship of $600 to Arthur Brooke, of Pitt Meadows.

(2) Trip to the National 4-H Conference in Washington, D.C., to John Stanlake, of Saanichton.

(3) Trip to attend National Club Week in Toronto and Ottawa to Donna Scoullar, Quesnel; Paul Howe, Saanichton; Doris Benson, Cedar; Barry Baehr, Cloverdale; Frank Allison, Cedar; Bob Evans, Victoria; Rose Smart, Victoria; Donna Hepburn, Chilliwack; Joan Youell, Victoria; Pat Hoole, Saanichton; Fay Grant, Abbotsford; Dennis Tournemille, Cloverdale; Daphne Brooke, Pitt Meadows; and Andy Grodoway, Grindrod.

Other Awards

In addition to the above awards, four members were chosen from the Fraser Valley to attend the State 4-H Conference at Pullman, Wash. These were Marilyn Hook, Mission; Krys Olejnik, Aldergrove; Maureen Verbeck, Hope; and Jack Closkey, Surrey. Aid was extended to two members—Lorne Earl, Newgate, and Joan Phillips, Lister—to attend the State 4-H Camp in Montana. Two members from Cranbrook district—Hazel Lye, Newgate, and Bill Blaine, Wycliffe—also participated in an exchange visit with Idaho 4-H'ers.

A tour for thirty 4-H members from Saanichton to Grays Harbour in Washington was organized this year. It is planned that the American group will return the visit in 1963.

Several in-Province exchanges were arranged between participating District Councils, giving each the privilege of visiting in another section of British Columbia and living in a 4-H home.

Leadership Development

Ten regional Leaders' Workshops were held during February and March at Dawson Creek, Vanderhoof, Armstrong, Salmon Arm, Kamloops, Langley, Abbotsford, Penticton, Nanaimo, and Cranbrook.

While these were primarily programmed to serve the needs of the leaders, they were of much benefit to staff members as well. Unique opportunities for discussion on all aspects of club work were afforded, which proved useful in final progress analysis. An estimated 80 per cent of all club leaders was reached through the workshop approach.

Two workshops were held in Saanichton and Vernon for the benefit of the junior leaders and proved to be of outstanding value.

Summer Assistants

As in past years, agriculture students from the University of British Columbia were hired to assist with the heavy summer commitment of the 4-H programme. The five students proved most capable and discharged their responsibilities with enthusiasm and vigour.

HOME ARTS SECTION

The activities of the Home Economist are reported in detail in her annual report. The Home Arts phase differs markedly in two respects from its parallel agricultural programme, as follows:—

(1) Home Arts is very short of local " resource " people. This results in most project problems, normally handled on a district basis, being directed to the central office.

(2) The entire concept of Home Arts projects and organization procedures is new to leaders and district staff. It can be reported, however, that progress is being made at a satisfactory rate.

The greatest need appears to be in the area of project and leadership instruction. To accomplish this, full participation in Leaders' Workshops, Provincial Club Week, and special training sessions with leaders and members on a club basis were carried out. More than sixty homes were visited, and forty separate club programmes were attended with this objective in mind.

Home Arts Projects

Number of Members in Clothing Projects

Level	Members	Per Cent
1	232	49.5
2	60	12.5
3	67	14.2
4	65	13.5
5	12	2.5
6	37	7.8
Totals	473	100.0[1]

[1] 84.6 per cent of all Home Arts.

Number of Members in Food Projects

Level 1	30
Advanced	11
Per cent of all Home Arts	7.4

Number of Members in Home Design Projects

Members	45
Per cent of all Home Arts	8.1

Project Evaluation

All Home Arts projects were inspected and evaluated at the close of the club-year. To achieve this for the 627 members, it was necessary to hire two university students as assistants.

Altogether sixty-five separate achievement-days were attended, 482 garments examined and scored, and 984 other items marked at these events. In addition, the assistants worked at field-days, fairs, Provincial Club Week, and finally at the Pacific National Exhibition.

APIARY BRANCH

J. CORNER, PROVINCIAL APIARIST

This year a total of 21,000 colonies of honeybees produced 1,450,000 pounds of honey, the smallest annual crop of the past ten years. A drop in production in the Peace River accounted for most of this reduction.

BEE DISEASES

With the exception of European foul brood and sacbrood, the incidence of honeybee diseases this year has been normal. Sacbrood, or what appears to be sacbrood, showed up in many colonies, with a total of forty-three cases reported from the Haney district. This disease was extremely severe in some colonies, with whole frames of brood affected. Some paralysis was noted on Vancouver Island and the New Westminster district.

This year a programme of very early spring inspections was instituted, in which inspectors were instructed to check apiaries for dead or very weak colonies. Over 50 per cent of our A.F.B.-infected colonies were located in this way. Such colonies and equipment were eliminated before early-flying bees had an opportunity to rob remaining stores. The time and effort spent on these early inspections was an important contribution to our disease-control programme.

Recorded outbreaks of nosema and paralysis were few, but cool, inclement weather resulted in widespread severe outbreaks of European foul brood in the Lower Mainland. TM 25 has been, and is, an extremely effective controlling agent of our two major brood diseases—European foul brood (*bacillus pluton bacillus alvei*) and American foul brood (*bacillus larvæ*).

Number of beekeepers		1,500
Number of colonies		21,000
American foul brood (colonies affected and burned)	105	
American foul brood (colonies treated)	32	
	—	137
European foul brood (colonies affected)		202

POLLINATION

Work on pollination has continued in co-operation with the Entomology Branch. In the Vernon area, beehive inserts and hand-collected pollen were employed on a block of 25-year-old McIntosh trees, and bouquets of Golden Delicious bloom were employed along with honeybee colonies on Red Delicious. Yields were increased in both instances, again demonstrating the value of pollination as a necessary part of the cultural practice. A detailed report on this work is available. Results are shown in the accompanying table.

Rental of honeybee colonies for pollination of crops increased during 1962. A total of 710 colonies was rented at a cost of $4,430, an average of $6.24 per colony.

Forty-five bumble bee domiciles were established in the Fort St. John district, with approximately 30 per cent acceptance recorded. Cool weather adversely affected this work during spring and early summer. The controlled use of certain species of bumble bees and solitary bees, alkali bee (*Nomia melanderi* and *Megachile rotundata*) offers real promise for increased production of alfalfa seed in British Columbia.

PACKAGE BEES

Twenty-five packages of bees were shaken at Coaldale, Alta., and installed on prepared brood nests in the Creston area. Acceptance of queens and establishment of packages were entirely successful. Details of this work are available on request.

OVER-WINTERING AND DIVISIONS

Colonies from the British Columbia Peace River area and Alberta are being over-wintered in the Okanagan, Fraser Valley, and Vancouver Island districts. A total of 2,000 divisions was trucked into the Peace River District this spring. This method of colony replacement will expand and result in considerable savings to the industry. Each division is valued at $5.50.

QUEEN-REARING

Two producers in British Columbia obtained queen stock which had been imported from Europe for the first time in many years. Plans are under way to conduct tests on carrying queens over winter in cage banks placed in colonies.

PUBLICATIONS

Five issues of " Bee Wise " were distributed. Circulation of this publication is 1,400 copies.

Work is progressing on revision and reprinting of the following publications:—

Apiary Circular No. 13—The Use of Drugs and Antibiotics in Controlling Bee Diseases.

Apiary Circular No. 11—Wintering Bees in British Columbia.

Apiary Circular No. 12—Package Bees in British Columbia.

A publication on tree-fruit pollination and a manual of beekeeping in British Columbia are also being prepared.

EXTENSION

Following a two-week beemaster's course at the University of British Columbia, twenty candidates obtained certificates. Short courses were held at Nanaimo, Fort St. John, and Dawson Creek.

Our 16-mm. colour film " Diseases and Pests of the Honeybee in British Columbia " is nearly completed. During the coming year, commentary and sound track will be added to the completed film.

POLLINATION TABLE

Yield of Apples in Numbers of Loose Apple-boxes in the Demonstration Orchards

McIntosh Block (550 25-year-old Trees)		*Red Delicious Block (150 16-year-old Trees)*	
Year	Yield	Year	Yield
1958	12,554	1958	1,764
1959	10,260	1959	442
1960	10,385	1960	2,760
1961	10,049	1961	1,794
1962	19,604	1962	4,036

DAIRY BRANCH

KENNETH G. SAVAGE, B.S.A., M.SC., DAIRY COMMISSIONER

PRODUCTION

		1961	1962 (Estimated)
Milk	lb.	917,301,840	930,000,000
Manufactured products—			
Butter (creamery)	"	5,879,585	6,500,000
Cheese (Cheddar)	"	1,167,867	1,050,000
Cheese (cottage)	"	6,351,000	6,800,000
Ice-cream	gal.	4,484,546	4,500,000

UTILIZATION

		1961	1962 (Estimated)
Used in manufacture	lb.	372,301,000	378,500,000
Used in fluid form—			
Fluid sales	"	479,500,000	485,000,000
Farm-home consumed	"	31,710,000	32,000,000
Fed to live stock	"	33,790,000	34,500,000

UTILIZATION OF MILK AS PERCENTAGE OF TOTAL PRODUCTION, 1961

	Canada	British Columbia
Creamery butter	42.8	15.0
Cheese	7.5	2.2
Concentrated milk and ice-cream	9.1	22.5
Fluid sales	30.2	52.3
Farm butter	1.0	0.9
Other purposes	9.4	7.1

MARKETING

In 1962 consumption figures for nearly all classes of dairy products showed the same trend which has become apparent in recent years. Consumption increases have not kept pace with increases in population or with accepted indices of increased standard of living. The exception to the general trend has been butter consumption, which has increased *per capita* due to significant price reductions.

Weighted average prices in Milk Board control areas show minor price fluctuations, which reflect an approximate 2-per-cent increase in milk production.

The Dominion Bureau of Statistics reports that in 1961 the average farm value of all sales of milk in British Columbia was $4.33 per hundredweight, compared to $3.09 for Canada as a whole. These figures are not expected to change materially this year.

DAIRY PLANTS

Eighty-three creamery or dairy licences were issued in 1962. During the year twelve dairy plants ceased operation for one reason or another leaving seventy-one in operation. Of this number, fifty-four are pasteurizing milk, twenty-one are making ice-cream, twelve butter, four cheese, one milk powder, one evaporated milk, and twelve cottage cheese.

LICENCES, CERTIFICATES, AND PERMITS

Licences

	Issued 1962
Creamery or dairy	83
Milk-testers	85
Milk-graders	61
Cream-graders	16
Tank-milk graders	69
Oleomargarine manufacturers	3
Oleomargarine wholesalers	20

Certificates of Proficiency

	Issued 1962	Total Valid
Pasteurizer operators—		
First class	7	49
Second class	7	138
Temporary	2	-----
Ice-cream makers—		
First class	1	11
Second class	----	16
Cheese-makers—		
First class	----	-----
Second class	----	4
Butter-makers—		
First class	----	4
Second class	----	9

Permits

	Issued 1962
To reconstitute milk	2
Tank-trucks	7
Farm holding-tanks	190

MILK GRADING

Milk graded by the resazurin test and reported by licensed milk-graders is compared below to figures for 1960 and 1961:—

	Number of Completed Tests	Number of Samples Not Qualifying	Percentage Not Qualifying
1960	78,097	2,792	3.56
1961	77,246	2,789	3.61
1962	76,814	2,612	3.40

A committee was established in 1962 at the request of the Minister to undertake research into milk-grading standards and to present recommendations which would lead to legislation establishing new standards for bacterial quality of raw milk. The committee's report was presented in December.

DAIRY SHORT COURSE

Seventeen students completed the correspondence and residence portions of the 1962 dairy short course.

LEGISLATION

The *Milk Industry Act* was amended in the 1962 Legislative Session. These amendments, the first major ones since 1956, were largely designed to correct problems which had arisen with regard to effective administration of this legislation. Regulations under the *Milk Industry Act* have been reviewed and amended, and their promulgation is anticipated shortly.

PERSONNEL

To fill an existing vacancy in the Dairy Branch staff (Vancouver office), Mr. R. N. Hitchman was transferred from the Prince George office to Vancouver, effective December, 1962. Mr. P. Regehr (Victoria office) spent some forty days assisting in the Vancouver area during 1962. A vacancy exists at the present time in the Prince George office.

SUMMARY OF DAIRY BRANCH SERVICES, 1962

Number of inspections and visits—	
Dairy plants	691
Dairy-farms	518
Butterfat check tests—	
Producer	1,110
Finished product	322
Laboratory analysis	1,841
Examinations (licences and certificates)	41
H.T.S.T. pasteurizers checked	18
Oleomargarine checks	58
Farm holding-tanks certified	190
Tank-trucks examined	9
Milk and cream grades checked	1,563
Milk samples collected	3,384
Meetings attended	72

SUMMARY AND OUTLOOK

The total farm cash value of all milk produced again exceeded $40,000,000. The increase in milk production was not as great in 1962, and 1963 should show a continuation of this trend. The problems facing the dairy plants in 1962 were intensified by general economic weakness, and those plants whose position was weakest, either in terms of capitalization or obsolescence of plant and equipment, ceased operation or were taken over by their stronger competitors. This reduction in the number of dairy plants may well continue into 1963. The quality of the dairy products offered to the consumer in British Columbia has remained high, and with improved methods and standards of raw-milk grading the quality should reach still higher levels in the future. Labour-saving devices on the farm and in the dairy plant have become more and more commonplace, and the future certainly indicates that even more extensive use will be made of them. A cautious note of optimism might be expressed for the dairy industry in general, although it continues to be beset by the cost-price squeeze. It now seems apparent that the successful survivors will be those who employ bold, aggressive tactics to increase a depressed profit margin in this most important industry.

DYKING AND DRAINAGE DISTRICTS

W. R. MEIGHEN, B.SC., DYKING COMMISSIONER

The year past was one of fairly quiet and normal operations for all of the various dyking and drainage districts in this Province. Few storms of high-intensity rainfall occurred to cause drainage problems or flooding and other damage to district properties. The one newsworthy storm of the year—Hurricane Frieda—which struck the Fraser Valley area in mid-October caused a power cut-off to many pumping-stations which lasted for several hours. This storm was not accompanied by a large amount of rain during the period of the power failure, and, therefore, little flooding occurred. Electrical installations or other works of the districts were not damaged as a result of this storm.

This year's freshet was not troublesome or costly to any district. Maximum reading on the Mission gauge was 17.22 feet, which is well below the average maximum of other recent years, and also below the danger level. No emergency conditions developed during the freshet in any of the dyke areas. Districts were therefore able to carry out a reasonable and adequate amount of maintenance of their works during the year and to make renewals of a capital nature in some instances.

Maple Ridge, Matsqui, and Sumas renewed electrical wiring and switch-box equipment in pumping-stations in these districts.

Matsqui renewed a concrete flood-box.

Numerous districts along the river carried out extreme bank-protection projects on river-banks fronting dykes to combat bank erosion. Total expenditure on this type of work approximated $180,000, financed jointly by the districts, the Province, and the Government of Canada.

The Surrey Dyking District carried out an extremely costly dyke-improvement programme.

ENTOMOLOGY BRANCH

C. L. NEILSON, M.SC., PROVINCIAL ENTOMOLOGIST

The year 1962 produced no major insect outbreaks. However, the cherry fruit fly (*Rhagoletis indifferens* Curr.) occurred in serious numbers in the Creston area for the first time, and San Jose scale was a problem in the South Okanagan. Further cases of resistance to hydrocarbons by carrot rust fly and cabbage root maggot were reported, and possible resistance to DDT by onion thrips occurred in the Okanagan. More than 500 inquiries concerning insects were handled from Victoria.

FIELD-CROP, FORAGE, AND VEGETABLE INSECTS

Grasshopper and cutworm populations remained low. Leaf roll of potatoes in the Lower Mainland was unusually high. The presence of tuber flea beetle (*Epitrix tuberis*) was established for the first time at Soda Creek, and the spotted cucumber beetle (*Crioceris duodecimpunctata*) appeared for the first time in the Okanagan Valley at Kelowna. Aphids were a problem on peppers at Vernon and also on crucifers in the Fraser Valley. Tomato horn worm occurred frequently in the Okanagan and Kamloops districts. Alfalfa webworm (*Autographa californica*) and beet webworm (*Loxostege sticticalus*) were a problem on canning-spinach at Vernon.

The " silver-tip of grasses " research project in the Peace River again showed DDT treatment as recommended gave partial control, but the reasons for the condition are still obscure. A wheat midge control project by adult spraying with DDT resulted in promising reductions of infested wheat. The turnip maggot project at Prince George and the aphids on crucifers project at Agassiz continued. A symphilid-control project was initiated at Chilliwack.

Miscellaneous inquiries covered a wide range of insects, as well as slugs, snails, moles, nematodes, and symphilids.

The work of establishing bumble bee domiciles in the Peace River area met with only fair success due to cool weather, but will be expanded in 1963, together with an attempt to establish the alkali bee (*Nomia melanderi*) in the Ashcroft district. The clover weevil (*Tychius picirostris*) was recorded as doing its first economic damage in British Columbia at Creston.

ORCHARD INSECTS

In general, orchard insects caused less concern in 1962 than for the past several years. Considerable work was done in the Okanagan on San Jose scale, aimed at establishing more data regarding seasonal development. Results of this work will result in a change in the control programme for 1963. Investigations at Creston established that the cherry fruit fly (*Rhagoletis indifferens*) (normally only on wild cherries) was very prevalent on cultivated cherries, and due to its later appearance extra sprays were needed to prevent serious damage. A pollination demonstration at Vernon, conducted with the Apiary Branch, on both Red Delicious and McIntosh apples was most gratifying. Yields were almost double those of the previous five-year average, and quality was excellent. Observations on seasonal development of the shot-hole borer (*Scolytus rugulosus*) on tree fruits in the Okanagan indicated an earlier appearance of adults than previously recorded. In Coastal areas, tree fruits were bothered by leaf roller, codling moth, tent caterpillar, and sawfly and aphids, but inquiries were largely from back-yard gardeners. Other inquiries involved flat-headed borers, mites, peach twig borer, cherry fruit fly, lecanium scale, and earwigs.

SMALL-FRUIT INSECTS

An attempt was made to eradicate grape phylloxera, which were brought into the Okanagan on grape plants in the spring. Some 4 acres of plants were dug and treated in November, 1961. During 1962 this acreage was treated with Dowfume 85W, with a soil insecticide applicator, and the surface further treated with Korlan. The treated plants were replanted during early May in the treated soil. Results to date indicate some damage from the previous November dipping of the plants in nicotine oil, but none from soil fumigation. A survey during the fall showed no infestation in these areas, but revealed subsequent spot leaf infestations of plants that were imported after a malathion dip and planted in the previous spring. These were eliminated individually, and the surrounding soil treated. The project will continue.

Cyclamen mite caused serious damage to a few fields of strawberries in the Abbotsford area. The better strawberry-growers are maintaining a more adequate spray schedule for both insects and diseases, with generally good results. Strawberry fruitworm and orange tortrix damage occurred infrequently. Root weevils continue to cause some damage each year. Black-headed fireworm control on cranberries with parathion spray was not as good as usual, probably due to the cool spring and prolonged emergence of adults.

Additional inquiries were received concerning white grubs, leaf rollers, currant fruitworm, leaf hoppers, black vine weevil, thread worm in strawberries, and collembola.

LIVE-STOCK INSECTS

A warble fly control campaign with systemic insecticides was carried out during September and October. Articles appeared in most newspapers and farm journals. Television shows were produced by the C.B.C. for Province-wide release and for individual shows at Kamloops and Kelowna. In addition, several districts were visited and the programme discussed at meetings with cattlemen. A revised publication, "Livestock Pests," was prepared and released.

There was some trouble with tick paralysis of cattle in the areas south-west of Williams Lake near the Fraser River and Kamloops-Merritt areas.

Mosquitoes continue as an annual problem, with technical support being given to the control districts as far as we are able. Results of control in most of the organized areas were fair to good. This phase of the work deserves more attention than we can possibly devote to it.

HOUSEHOLD AND WAREHOUSE INSECTS

There were numerous inquiries for control measures for carpet beetles, carpenter ants, termites, black widow spiders, powder post beetles, wasps, ants, and earwigs in homes from residents of Coastal areas. Other frequent inquiries concerned bedbugs, lice, ladybird beetles, booklice, fleas, flies, mites on canaries, houseplant insects, ticks, angleworm-rearing, flatheaded borers in flooring, ground beetles, silverfish, Mediterranean flour moth, spider beetles, false scorpions, root weevils in homes, clover mites, clothes moth, ambrosia beetles in furniture, bats, and miscellaneous spiders. There was an unusual case of the hide beetle (*Dermistes vulpinus*) larvæ infesting Gyproc which was shipped in a rail car that had previously had hides shipped in it.

The Canada Department of Agriculture, Vancouver, reports no new insects occurring in cereal warehouses and mills throughout the Province. The degree of infestation of the various species of insects common to such establishments in different centres is listed as revealed through continuous inspection.

ORNAMENTAL- AND SHADE-TREE INSECTS

Ponderosa pine in the Summerland area was heavily infested with pine needle scale. Rogor was tried as a bark treatment, but was inadequate. Similarly, Rogor was ineffective as either a spray or bark treatment for balsam woolly aphid at New Westminster. Insecticide trials were conducted in conjunction with the Canada Department of Forestry, Vernon, for control of midges (*Contarinia*) on Douglas fir (Christmas-tree trade). Results indicated Thiodan to be very promising, and this will be recommended on a trial basis to Christmas-tree farmers. Other common pests on ornamentals in the Interior included the rose slug, yellow-necked caterpillar, and the elm gall aphid. In Coastal areas common pests were leaf rollers, tent caterpillars, cotoneaster webworm, and juniper webworm. Miscellaneous inquiries included oak looper, holly leaf miner, laurel borer, willow apple gall, rose weevil, mites, spiny elm caterpillar, blister mite on walnut, pear slug on mountain ash, hawk moth larva, Douglas fir tussock moth, cyclamen mite, nematodes, azalea leaf miner, and aphids.

EXTENSION AND PUBLICATIONS

We took an active part in the revision of tree-fruit, vegetables, and small-fruit insect- and disease-control calendars. Mr. Arrand participated in the Northern Chautauqua Tour, the Okanagan Orchard Tour, the Armstrong Fall Fair, the Vegetable Growers' Field-day at Vernon, the Beemasters' Course, the Pacific Northwest Insect Conference at Portland, Ore., adult education school at Armstrong, and several stockmen's meetings regarding warble fly control. Mr. Neilson participated in Fraser Valley Mosquito Control Board programme and other similar control programmes, the National Pesticide Committee, the Western Livestock Conference, Sheep Producers' Field-days, adult education (agriculture) school at Abbotsford, grape phylloxera control with Federal officials, and several meetings on warble fly control. We participated in seven television programmes, prepared several press and radio releases, and took an active role in the Entomological Society of British Columbia. Two new circulars were prepared and released, together with nine mimeograph leaflets.

FARMERS' INSTITUTES

L. W. JOHNSON, SUPERINTENDENT

At the start of the year 1962 fifty-six Farmers' Institutes that for a number of years had been inactive were dissolved and their certificates of incorporation cancelled. During the year four more institutes ceased to operate, and two institutes, Sweetwater and Parklands, amalgamated. One hundred and twenty-two institutes filed annual reports, showing a membership of 4,986 and purchase of commodities for members totalling approximately $1,500,000.

DISTRICT INSTITUTES

District Institutes held annual meetings during the year, as follows:—

District	Place	Date
District " E "—Lower Fraser Valley	New Westminster	March 2.
District " I "—East Kootenay	Cranbrook	May 31.
District " G "—Okanagan-Shuswap	Deep Creek	June 6.
District " H "—Cariboo	Quesnel	June 9.
District " J "—Peace River	Fort St. John	June 20.
District " C "—Nechako	Prince George	June 21 and 22.
District " B "—Skeena-Bulkley	Telkwa	June 25 and 26.
District "A"—Vancouver Island and Gulf Islands	Nanaimo	September 29.
District " D "—Kamloops-North Thompson	Kamloops	October 19.
District " F "—West Kootenay (semi-annual)	Nelson	June 2.

ADVISORY BOARD OF FARMERS' INSTITUTES

The forty-fifth annual meeting of the Advisory Board of Farmers' Institutes was held in Victoria on October 23rd, 24th, and 25th, at which time the Board dealt with seventy-one resolutions submitted by the ten District Institutes and presented a brief to the Provincial Cabinet dealing with such matters as farm machinery, land-clearing, revision of the *Sheep Protection Act,* rural electrification, land-surveying, coloured gas for farm vehicles, soil-testing, and exemption from the social services tax on drugs for veterinary purposes.

EXHIBITIONS AND FALL FAIRS

During the year the Central Fraser Valley Fairs Association at Abbotsford was granted Class B status, bringing the total number of Class B exhibitions in the Province to eight. In addition, there were one Class A and ten Class C exhibitions and forty-four recognized fall fairs.

POUND DISTRICTS

Pound districts constituted in unorganized territories during the year are as follows: Little Boulder, January 5th; Keats Island, February 15th; Sointula, March 26th; Fanny Bay, July 12th; Cobble Hill, July 12th; Carmi, August 6th; and Nukko Lake, August 23rd.

Boundaries of six pound districts were extended, and pound-keepers appointed for fifteen districts.

MISCELLANEOUS

Seven Grasshopper-control Committees received advances for the purpose of exterminating and controlling grasshoppers in their respective areas.

Fence-viewers were appointed for the Cowichan-Newcastle and Esquimalt Electoral Districts, and 120 licences were issued to sell poisons used exclusively in agriculture.

FIELD CROPS BRANCH

NORMAN F. PUTNAM, M.SC., FIELD CROPS COMMISSIONER

CROP PRODUCTION

CEREALS

Acreage increased this year, principally in the Peace River District. Adequate rainfall during the summer produced good yields but tended to delay maturity. Continued damp weather made harvesting difficult and resulted in a down-grading of both quality and grade. Grain production in the North Okanagan and Creston districts was about average. Harvesting of a good oat crop in the Fraser Valley was hampered by unusually wet weather conditions. Movement of feed grains from the Peace River to feeding areas in the southern parts of the Province continued at a steady pace.

HAY AND PASTURE

As with the cereals, hay and pasture growth benefited from summer rains, but unfavourable harvesting weather resulted in a general lowering of the quality of winter hay stocks. In the Cariboo a number of the wild-hay meadows were inundated, preventing many ranchers from cutting sufficient stands to maintain normal winter feeding requirements.

SEED PRODUCTION

Because of the improved grain-marketing situation, there was a reduction in forage-seed acreage this year, as many of the old fescue-fields were ploughed under and seeded to cereals. Production of registered seed of Selkirk wheat and Rodney oats remained unchanged in the Creston area.

The following table lists the acreage of crops inspected in British Columbia as supplied by the Plant Products Division, Canada Department of Agriculture:—

Crop	Acres	Crop	Acres
Wheat	775	Flax	15
Oats	571	Forage seeds	1,567
Barley	325		

Estimated yields of commercial forage-crop seeds for 1962, together with the final production figures for 1961, are shown in Appendix No. 19.

The annual seed fair was held in February this year at Fort St. John.

A seed-growers' short course was also held in the Peace River in July of this year, sponsored jointly by the Seed Growers' Association, the Department of Extension at the University of British Columbia, and our own Department. The course was well attended and received.

Potatoes

Potato acreage was up slightly this year, but average marketable yields were down due to the unfavourable growing and harvesting year. The wet fall in Coast areas made digging difficult, and many crops went into storage in a wet, dirty condition. Many acres of low-lying potato land on Vancouver Island could not be harvested because of flooding.

Approximately 1,500 acres of certified seed potatoes were passed by the Federal inspection service this year. The main areas of seed production with acres inspected in 1962 are as follows (1961 acreages in parentheses): Pemberton, 261 (405); Vancouver Island, 337 (309); Lower Mainland, 115 (340); Okanagan, 142 (182); Cariboo, 200 (190); Central British Columbia, 26 (53); Boundary District, 93 (215); Kootenays, 332 (414).

Sixty potato samples from seed-growers in British Columbia are being tested in greenhouses at the University of British Columbia and at the Experimental Farm, Saanichton. Disease readings were completed on these samples by the end of the year and forwarded to growers.

Field Peas

Acreage in field peas was again reduced this year, and yields are about average.

BRITISH COLUMBIA CROP IMPROVEMENT ASSOCIATION

Forty-one tests were forwarded to members during the past season, with alfalfa variety trials being the most popular. Foundation seed of La Salle red clover, Rambler alfalfa, and Manchar brome was distributed to seed-growers for production.

DEMONSTRATIONS AND TRIALS

Demonstration trial plots, including fertilizers, herbicides, forage crops, and potatoes, were established in many areas of the Province again this year. Most of these trials are on a continuing basis to assess results over several years. A soils extension programme was started this year.

SOIL AND FORAGE ANALYSES

Laboratory work is continuing to increase. The following table indicates the work of the laboratory this year:—

Materials Tested	Determinations or Analysis	Number of Samples
Soils	Nitrates, phosphorus, potash, calcium, and pH	3,700
	Conductivity (total salts)	250
Water	pH and conductivity	15
Feeds and Forage	Crude protein, moisture, pH	153

AGRICULTURAL LIME

For the ten-month period ended October 31, 1962, 34,911 tons were distributed under the Federal-Provincial Lime Subsidy Policy, a decrease from 1961.

The following is a five-year summary of movement of agricultural lime and subvention paid:—

Fiscal Year	Total Number of Applications Approved	Total Amount of Subsidy Recommended	Total Tonnage Used
1957/58	1,461	$100,588.24	34,404.75
1958/59	1,288	107,749.24	36,529.09
1959/60	1,326	118,989.76	41,298.81
1960/61	1,328	117,110.26	39,835.68
1961/62	1,436	129,212.85	43,505.20

FERTILIZER AND AGRICULTURAL POISONS BOARD

One meeting of the Board was held this year, and the following fertilizer mixes were approved: 2–15–15, 4–10–10, 6–8–6 (organic), 6–30–15, 8–10–6, 10–20–10, 10–30–10, and 13–16–10.

WEED CONTROL

During the past season two Weed Inspectors were employed for the summer season in the Peace River District, and one temporary Weed Inspector in the Pemberton Valley for two weeks in June.

The Department of Highways increased its spray programme this year to include approximately 3,000 miles of roadside. There is increased acceptance of chemical herbicides for weed control in small-fruit and horticultural crops.

TORONTO ROYAL WINTER FAIR

There was a limited number of samples forwarded this year from British Columbia growers. Mr. Needoba, of Salmon Arm, and Mr. Pendray, of Victoria, took second and third places respectively in Netted Gem potatoes.

GRAIN SCREENINGS

During the eleven-month period January to November, sixteen permits for removal of screenings were issued to elevators and merchants, and during the same period forty feeders' permits were issued.

Nine processing plants are licensed to devitalize screenings. The grinding and steam pressure as prescribed have, in all cases, given excellent devitalization of weed seeds. Most of the refuse screenings used in British Columbia are now being devitalized and pelleted. Prices remained high during the past year due to a shortage of supplies.

HORTICULTURAL BRANCH

A. C. CARTER, B.S.A., PROVINCIAL HORTICULTURIST

Unfavourable weather made 1962 a difficult year for most producers of horticultural crops. Spring frosts, summer rains, a low accumulation of heat units, and less than average sunshine combined to create many problems. A favourable aspect was the open fall with moderately dry weather, permitting the harvest of most crops without undue difficulty.

Highlights during the year included a keen interest in grape production throughout the Province, particularly in the Okanagan Valley. The acreage increase in the past two years has been 196 acres. Loganberries also gained substantially in popularity over the same period. Two years ago it was difficult to market these crops, but today the demand exceeds the supply, and it appears that this will continue. Fruit-trees in the Interior have seldom looked better than they did in 1962, largely as a result of good cultural practices and relatively mild winters since 1955/56.

The Branch has carried out an intensive study of the present methods of picking, storing, packing, shipping, and marketing of fresh tomatoes in co-operation with the Research Station at Summerland. The information gleaned is being supplied to the industry through meetings and the published "Grower Notes," which are mailed out regularly. It is hoped that there will be a return to tomato production on a sound economic basis for both the processing and fresh markets from Interior fields.

A continuing programme introduced two years ago to help the greenhouse industry is making greater supplies of tomatoes available during the spring of the year.

The certification programme for nursery stock received a setback because of the lack of agreement on a programme acceptable to the Interior tree-fruit nurseries, but the delay provided another year for work in the colour coding of nursery stock. The Branch has now shown the way in tree coding, and as soon as the industry is prepared to move into the programme, it will be prepared to assist them.

TREE FRUITS IN THE INTERIOR

All areas reported good orchards in demand but few for sale. The trend to larger holdings continued either on a purchase or lease basis. The price of orchards, particularly in the Kelowna area, is increasing. Reasons for this include the desirability of the Okanagan as a place to reside and higher prices received generally for fruit.

The completion and opening of the Trans-Canada Highway has caused a tremendous upsurge in highway traffic throughout the tree-fruit area. Significant quantities of produce are being sold on the roadsides. In some districts the impact of these sales is being felt by packing-houses and is reflected in higher packing charges. On the other hand, the easier access to Prairie markets, lower transportation costs, and reduced shipping time are especially important with highly perishable products. (*See* Appendix No. 14.)

Cherries.—Although cherry production was down from last year, it was still the third largest crop recorded. The quality was generally good, and splitting was light. Cherries for distant markets were harvested earlier than usual this year. The potential for this crop is now greater than it has ever been.

Apricots.—The apricot crop was equal to the average of recent years. The harvest period was spread out over a long period, in sharp contrast to 1961, but in spite of this the Wenatchee Moorpark variety continued difficult to market.

Peaches.—Despite cool weather in midsummer, the fruit sized well and produced the largest crop since 1949. Quality was good, and a prolonged harvest period made picking less of a problem than usual.

Pears.—The Bartlett crop was down, but Anjous were up sharply. Mixed sizes and maturities resulted from the prolonged blossom period. The quality of the crop was not up to the usual standard because of physiological disorders and frost damage to the fruit.

Apples.—The apple crop was up from last year, largely because of the increased size of the fruit. Red colour developed slowly, particularly in the older trees which have not been converted to red strains. Water-core was a serious problem in Delicious and Winesaps. A tank has been developed in which an alcohol-water solution is used to separate out the water-cored from the sound fruit. There were reports of weak fruit from several areas of the Pacific Northwest, which adversely affected prices.

Tree-fruit Exports

For many years apples and pears were the only tree-fruit crops exported, but during the last two years B.C. Tree Fruits Limited has tested the feasibility of exporting fresh cherries, apricots, and peaches to the United Kingdom. In the 1961 tests, cherries arrived in satisfactory condition and sold at good prices. Troubles were encountered with apricots through freezing on board ship, and disappointing delivery was made.

In 1962 the cherry export was expanded, but the fruit did not arrive in satisfactory condition. However, apricots arrived in excellent condition and brought top prices. Elberta peaches were also well received. These tests will be continued.

Apple exports in 1962 to the United Kingdom were restricted because of the lack of small-sized fruit in the higher grades.

Picking-bags for Tree Fruits

Experimental picking-bags, designed to reduce fruit bruising, were supplied to each Interior office for evaluation in co-operation with the Department engineers. This programme allowed a number of growers to try the equipment before purchase and provided an opportunity to suggest further improvements.

Sprayer Testing

In addition to air-speed indicators, tachometers have been issued to each horticulturist in the tree-fruit area. Growers are becoming increasingly aware of the value of the Horticultural Branch sprayer-testing programme. An example was noted in the Kelowna area where forty machines were tested and eighteen were found to have an adequate air speed. This compares with thirty-five inadequate last year out of fifty-two machines. Suggestions were made for simple improvements generally, although in many instances specialist technicians were required.

TREE FRUITS ON THE COAST

Low temperatures, strong winds, and frequent showers prevailed throughout the blossoming period of tree fruits on the Coast. In spite of the adverse conditions, the set on fruit-trees was fairly good. A heavy drop took place on cherries and prunes.

Unsprayed apple and pear trees were severely infected with scab, which made the fruit unmarketable. Stone fruits, particularly sweet cherry, were infected with coryneum blight. The prune crop was light and tended toward small fruit sizes. Many inquiries have been made in district offices regarding apple-culture on the Coast, using dwarfing stocks.

GRAPE PRODUCTION

The Horticultural Branch throughout the Interior is spending considerable time on grape problems. New varieties are being assessed for yield, quality, winter hardiness, disease and insect resistance, and other factors.

In the past two years the acreage for this crop had increased by 204 acres and the number of growers by thirty-six. The main increase was 80 acres in the Diamond variety, 60 acres in trial hybrids, and 19 acres in Patricia. On the Coast, once again poor pollinating conditions resulted in a very poor grape crop. (*See* Appendix No. 15.)

Grape plantings are increasing at a more rapid rate than had been anticipated because of the substantial increase in demand by the four wineries in British Columbia. Until recently wine grapes were grown mainly in the Kelowna district, but now commercial plantings are located in areas from Winfield to the United States Border and in the Similkameen Valley. In some cases long-term leases have been obtained on Indian reservations for vineyards. The price offered to growers is $120 or more per ton by wineries, with contracts lasting ten or more years.

Soluble solids content of winery shipments was checked by Branch personnel and found to be satisfactory despite the cool weather, except for the Diamond variety, which was harvested at a somewhat immature stage.

The Kelowna office has instituted trials on pruning methods which have been used in other grape-growing areas but not in this Province. Results of trials in the Westbank area indicate that specialized pruning methods will have considerable influence on yield.

SMALL FRUITS

The acreage of strawberries, raspberries, loganberries, blueberries, and cranberries is increasing steadily at present. The demand for fruit has been good, and prices have reflected the high quality of the British Columbia small-fruit crop. (*See* Appendix No. 16.)

Strawberries.—Spring growth on strawberry plantings was very slow through April and May on the Coast, with full bloom occurring in the Fraser Valley on May 27th, fourteen days later than the long-term average. Picking was carried out between June 25th and July 15th. The plants carried a satisfactory crop, but losses occurred from fruit rots, particularly on the variety Siletz. In spite of the adverse weather, yields were good, with 6 to 8 tons per acre common.

Saanich and Salmon Arm fresh strawberries were shipped to the Prairies, and the growers were encouraged by the prices received. Creston acreage is declining, and most of the crop is sold directly from the farm.

Three new varieties are under trial in the strawberry area of the Province—Cascade, Columbia, and Mollala. They were developed in Washington and Oregon and are showing promise here, especially on the Coast.

The certified plants which were planted in the spring by growers required some replanting, especially in the Saanich area. The supply of certified plants for the 1963 planting looks promising as to quality. The number available for 1963 is substantially greater than for 1962, and an early estimate is as follows:—

Variety	1962	1963
British Sovereign	372,000	625,000
Siletz	125,000	450,000
Agassiz	30,000	225,000
Puget Beauty	.....	75,000

Raspberries.—Raspberry production in the Fraser Valley was again lighter than average. The reduction resulted from drought conditions the previous year and fruit rots associated with rains at picking-time.

A large acreage was planted out this year, with up to 250 acres in the Abbotsford district. The canes grew vigorously, so that the crop could increase by 40 per cent in 1963. In Creston there will need to be a replacement programme with virus-free stocks before the industry shows an upward trend in production.

A very strong market demand for raspberries existed in 1962 at favourable prices to the growers, and inventory holdings in the United States indicate a similar market for the 1963 crop.

The raspberry certification programme was inaugurated in 1961 and has progressed satisfactorily. The varieties Newburgh, Sumner, Willamette, and Puyallup will be available to growers for 1963 plantings.

The Newburgh variety has been propagated under the programme through direct contract between the industry and one propagator. Planting stock of this variety will be available to growers of the firms participating in the contract.

The following shows an estimate of raspberry plants for 1963 planting under the raspberry certification programme:—

Variety	Number of Plants	Sufficient to Plant (Acres)
Newburgh	105,000	52
Willamette	20,000	10
Sumner	30,000	15
Puyallup	5,000	2

Blueberries.—The total blueberry production for 1962 was lower than the 1961 crop by approximately 14 per cent. This crop depression was brought about by several factors, with the weather being the main deterrent. Cool, damp weather during the blossom period reduced the fruit set. In addition, several diseases were rampant.

The blueberry industry still enjoys a strong market and favourable prices; consequently, expansion continues and estimates suggest that the industry will involve 1,000 acres in 1963.

Cranberries.—The cranberry industry expected to show a substantial crop increase this season, but frost, hail, and sub-normal temperatures reduced the crop by 16 per cent below last year. Weeds, dry-stem, insect damage, and water relationships also caused some crop reduction.

Harvesting and pruning are accomplished by mechanical means. Last year's operations in one plantation revealed that equipment damage to the following season's crop may be excessive. One grower estimated a 25-per-cent crop reduction in some portions of the field where extra travelling by machinery had occurred.

The industry will show a slight acreage increase in 1963.

Loganberries.—The size of the loganberry crop was reduced by adverse weather in the spring, as were other small-fruit crops generally, but the remaining crop was of excellent quality.

Fresh sales were lighter than last year, and only six carloads were shipped to the Prairies. The price received by growers for processing berries was down from last year, a situation which does not reflect the strong demand for this crop.

Bush Fruits.—Interest in black currants, red currants, and gooseberries remains at a very low level, and few new plantings are being set out. No increase is anticipated until such time as varieties adaptable to mechanized harvesting are available, or a substantial price increase occurs.

Filberts.—Pollinating conditions were poor for the 1962 crop, but the increased productivity of the plantings compensated for the poor set, so that the estimated crop of 150 tons is little changed from 1961. A 1962 survey of the Fraser Valley indicated 317 acres planted to this crop. The price to the producer is 30 cents per pound, which is an increase from 28½ cents in 1961. Other parts of the Province have small acreages of little economic importance.

VEGETABLE CROPS ON THE COAST

Competition between various firms in vegetable processing for growers and land is becoming more intensive. There is a trend toward company-operated enterprises, particularly in peas, beans, and corn. The packer is anxious to assure himself of a given tonnage of uniform-quality product. The processing firms in the Chilliwack area alone are reported to have produced $5,000,000 worth of packed horticultural products in 1962.

Peas.—Early-maturing varieties seeded during April and early May produced heavy crops. The growing season upset the maturity schedule, resulting in lower quality and a crop out-turn slightly below average.

Pole Beans.—Pole bean crops probably fared the poorest of any vegetable this year as the crop was seriously damaged by diseases. Harvesting labour was scarce in September, and yields were very low, with the average around 4 tons per acre.

Corn.—In spite of a late start, the cannery-corn crop gave the highest yield for many years. Presumably the uniform soil moisture during the summer with a relatively warm September allowed the corn to develop to the utmost. Sweet corn for processing averaged about 7 tons per acre instead of the normal 5 tons.

Broccoli.—Broccoli developed very slowly through August, but the warm temperature prevailing through September and October permitted continued harvesting, with yields of about 4½ tons per acre. The packers were unable to process sufficient tonnage, primarily because they lack adequate facilities to handle the crop which was available before the end of August.

Cauliflower.—Cauliflower tonnages were lower than expected as the cool temperature in August resulted in premature bolting. Minor element deficiencies were troublesome and are being studied.

Brussels Sprouts.—The topping and single harvest technique on brussels sprouts is creating a renewed interest in this crop. Officials from the Abbotsford office worked very closely with the growers in an attempt to develop the programme, and the result has been most gratifying.

VEGETABLE CROPS IN THE INTERIOR

A total of 5,224 acres was devoted to fresh and processed vegetables in 1962. Among the twenty-five vegetable crops grown, only onions registered a substantial increase in acreage. Early cabbage, peppers, zucca melons, and baby beets for processing showed small acreage gains. Potatoes, tomatoes, dried peas and beans registered a substantial decline in acreage.

In the Cranbrook, Creston, and Grand Forks areas, vegetable acreage declined, with the main reduction in dried peas.

In Northern British Columbia, vegetable acreage was 1,194 acres last year and 1,275 acres this year. The 1960 acreage had totalled approximately 800 acres. First shipments to the fresh market were made during the last week of July, almost a month later than normal.

Tomatoes.—Nearly all shipments of tomatoes to the fresh market from the Okanagan were pre-cooled to 53° F. at shipping point this year, and buyers indicated that fruit condition was improved over previous years.

Canneries did not start processing this crop until early September. The cannery pack was lighter and the quality of tomatoes was lower than usual. Loss in the field from diseases is estimated to be about 5 tons per acre on the average. It appears that an annual spray programme for prevention of these troubles will have to be carried out.

The Superintendent of the Summerland Research Centre requested the Horticultural Branch to co-operate on a special committee to deal with tomato problems in the British Columbia Interior. Much of the work of this committee will centre around the establishment of several project farms in the Vernon area. Preliminary meetings in the fall have outlined plans for selection and operation of the farms.

Efforts in promoting the development of a larger Interior onion industry have resulted in an increased production in the Interior from 4,000 tons in 1959 to nearly 7,000 tons this year. Further increases are required until the industry reaches a production of 12,000 tons annually if our normal markets are to be supplied from B.C.-grown onions.

Asparagus.—The first asparagus was harvested on April 15th, but volume was not available until the end of the month. Asparagus quality was up but yields were down this season. Cannery shipments concluded June 11th. The price this year was 16½ cents per pound for the 7-inch utility grade at the farm.

Cucumbers.—Cucumbers of excellent quality were shipped throughout July, and movement of the crop was satisfactory.

Peppers.—Peppers showed blossom by the end of June, but fruits were not shipped until early August. Quality and prices were exceptionally high.

Swede Turnips.—Swede turnip acreage in North Central British Columbia continued its gradual increase in 1962. Approximately 150 acres were grown in that area this year. Crop development was good, but splitting from excess moisture was a major problem.

GREENHOUSE CROPS

A survey of greenhouse areas and crops was completed during the summer months. Total area under glass and plastic in the Lower Mainland is 1,902,987 square feet, as compared to the 1957 area of 1,606,839 square feet.

A steady growth of the greenhouse industry on the Lower Mainland is continuing. The area under glass is increasing steadily, and the type of construction is being constantly improved. A summary shows the 1962 crop areas as compared to those of 1958 for some of the more important greenhouse crops. It is noteworthy that cucumbers and corn have increased by 88 per cent and chrysanthemums by 44 per cent. Decreases were reported in stocks and carnations.

Greenhouse Crop Areas, Lower Mainland

	Square Feet, 1958	Square Feet, 1962
Tomatoes	353,990	403,330
Cucumbers	40,000	75,222
Chrysanthemums	554,588	799,003
Carnations	165,745	142,375
Roses	74,925	141,297
Stocks	78,399	45,920
Snaps	44,560	52,465
Bedding plants (number of flats)	133,300	148,650

Tomatoes.—The yield and quality was generally good, except for some ranges on Vancouver Island.

Bright weather early in the year favoured the tomato crop. Dull, wet weather in the latter part of the season favoured development of fungus diseases. Prices throughout the season were satisfactory.

Cucumbers.—Production of long English cucumbers continued to increase steadily on the Lower Mainland and Vancouver Island. The seasonal demand for this crop is influenced strongly by the weather, and during the past season there were temporary surpluses. Average prices throughout the season were satisfactory, and prospects are for a continued increase in production.

Chrysanthemums.—The long open fall has reduced the demand for greenhouse flowers, and prices for the fall crop were low. Although the fall chrysanthemums crops have not varied greatly during the past few years, there has been a large increase in the crop of year-round chrysanthemums, especially on the Lower Mainland, where 581,000 square feet are devoted to this crop, as compared to 417,000 square feet for the fall crop.

Roses.—Production of greenhouse roses has increased steadily, and this trend is continuing. Most of the extension work with roses is in connection with pest and disease controls.

Carnations.—One large carnation-grower in Vancouver has been forced to remove his greenhouse, which has resulted in a temporary reduction in crop area. The carnation market appears to be steady, and a gradual increase in production over the next few years is foreseen.

Specialty Flowers.—There appears to be less demand than formerly for gardenias, and the one grower producing this crop has reduced output. Orchid production has increased about 15 per cent in the past three years. No further increases for the time being are expected.

Pot Plants.—Chrysanthemums are the most important crop in this category with 127,000 square feet of production. Tropical foliage plants with 69,000 square feet are second, followed by geraniums, azaleas, Easter lilies, hydrangeas, poinsettias, and cyclamen, in order of importance.

NURSERY STOCK

Tree Fruits.—There has been a slight decrease in the tree-fruit nursery-stock crop. Appendix No. 17 shows the numbers of trees of the various kinds produced during the past five seasons.

Apple Rootstocks.—Appendix No. 18 shows the number and percentages of 1-year-old apple-trees produced on the various rootstocks in 1962. E.M. II continues to maintain its place as the most important of the clonal stocks, followed by E.M. VII. There is a significant increase in M.M. 104 and a sharp increase in M.M.

106, and M.M. 111 is in prospect for the coming year. McIntosh seedlings account for the bulk of the non-clonal stock, and in the category " other fruit stocks " the largest portion is Antanovka seedling.

Hardy Framework Trees.—McIntosh continues to be the most important of the hardy framework trees. Although the number of Antanovka and Haralson show an increase over the previous year, very little of these varieties has budded for 1963. Hibernal has almost disappeared from the nurseries. There is some interest in Ottawa 292 and Red Astrachan; these varieties will be available in small quantities in 1963.

Coniferous Evergreens.—Locally produced evergreens have been sold at an increasing rate in the past few years. Imports are now confined mostly to lifting-out stock.

Broad-leaved Evergreens.—Local growers have taken advantage of the increase in price of imports and have propagated large quantities of rhododendrons and other broad-leaved evergreens during the post season. There is a continuing good demand for this stock, and no overproduction is foreseen in the immediate future.

Tree-fruit Nursery Stock.—With the exception of peaches, all 1-year-old tree-fruit nursery stock grown in British Columbia was inspected for trueness to variety during the summer, and mixtures were either removed or marked. Rootstocks for budding were also inspected, and any mixtures found were removed. There was substantial decrease in the number of mixtures found this year, and this is attributed largely to the fact that much of the budwood used for this year's crop was obtained from the Research Station at Summerland.

Colour Coding Nursery Stock and Certification.—The colour coding of nursery stock, as developed by the Branch, has proved to be a practical method of marking varieties in the field to identify trees grown from approved budwood material and to prevent mixtures after digging. Aerosol-type containers of tree- and log-marking paint are used, and each variety is marked with either a narrow or a wide band of paint on the trunk at about 3 feet above ground-level. A second band of paint, either just above or just below the bud union, identifies the rootstock.

A comprehensive certification programme for tree-fruit nursery stock which requires use of approved and, as far as possible, virus-free budwood has been requested by the British Columbia Fruit Growers' Association. Co-operation between the various groups concerned and the Horticultural Branch has developed a certification system which will provide healthy productive nursery stock for the fruit industry.

During the past summer approximately 57,000 trees were marked. When a full-scale certification programme is adopted, it is expected that it will be necessary to mark at least 200,000 trees per year.

Dormant tree-fruit nursery-stock inspections were carried out as in the past. Trees were rather late in maturing this fall, and, as a result, digging, which commenced on October 15th, had to be halted, and much of the stock was not dug until the early part of November.

DEMONSTRATION PROJECTS

District offices of the Horticultural Branch have again given demonstrations on pruning, budding, grafting, and crop-handling in its various aspects. Numerous tests on fungicides, insecticides, and herbicides have been carried out in all areas where horticulturists are located. A few selected demonstrations follow in brief outline:—

Apple Scab Control.—The extension trial programme to determine the minimum dosage of cyprex and the minimum number of spray applications required to control apple scab has continued. The efficiency of new and trial materials is also under test.

Strawberry and Raspberry Variety Trials.—Trials are under way at Saanichton, Abbotsford, Salmon Arm, and Creston Valley to evaluate new varieties of strawberries and raspberries to observe their suitability to various parts of the Province.

Vegetable Varieties.—Samples of promising new vegetable varieties were supplied to growers for test and limited commercial trial in many areas where field vegetables and greenhouse vegetables are grown.

Blueberry Fertilizer Trials.—Plots have been maintained since 1957 by the New Westminster office to determine the effects of nitrogen, phosphorus, and potash on blueberries. It has been observed that high nitrogen causes excessive growth and reduced yields on organic soils.

Nematode Studies.—Horticulturists from Abbotsford and Kelowna were given an intensive one-week course on nematodes by the specialists at the Saanichton Experimental Station. Facilities are being provided at Abbotsford to extract nematodes. Tests using marigolds to suppress nematodes were continued.

EXTENSION PROGRAMMES

Mass media is being used more extensively than ever. The weekly television show on CHBC-TV has continued, and has been expanded to provide another weekly show at Kamloops.

All District Horticulturists have presented programmes regularly on the radio stations in the Okanagan and in the Fraser Valley. Numerous spot bulletins were broadcast over radio stations and the C.B.C. network.

Articles for orchard journals have been contributed regularly. Interviews and prepared articles have been made available to the local newspapers.

The Growers Chautauqua meetings were presented at twelve points. Field-days during the growing season were also held. These attract keen interest, especially when carefully timed. Requests for speakers at growers' or gardeners' meetings were filled.

PLANT PROTECTION ACT

The *Plant Protection Act* was amended in 1962, making provision for the licensing of each place of business selling more than $250 worth of nursery stock and increasing the penalty for persons violating the Act.

Regulations were passed providing for codling moth districts at Kaleden, Winfield and Okanagan Centre, Rutland and Ellison.

FEDERAL-PROVINCIAL FARM LABOUR SERVICE FOR BRITISH COLUMBIA

(A. C. Carter, Director)

The supply of casual labour was satisfactory to meet the requirements of the various industries using this service throughout the Province. Placements were well in excess of those made in 1961.

A high degree of co-operation and co-ordination existed between the placement officers in the seasonal farm employment offices and their counterparts in the National Employment Service. Mr. A. T. Stephenson, Regional Primary Industries Officer, Unemployment Insurance Commission, Vancouver, was co-ordinator of the programme.

The former field office at Sidney was replaced by a growers' field representative working under the direction of the National Employment Service manager at Victoria. The arrangements worked out particularly well, and growers expressed approval of service provided this season.

Labour for harvesting small fruits in the Abbotsford district has been a problem for many years. At the end of 1961 the District Horticulturist, with various farm-labour representatives, persuaded growers to appoint their own committee to suggest improvements and work with the National Employment Service. A mimeographed booklet outlining steps that should be considered in alleviating labour problems was widely distributed and favourably received. In November the activities of the committee were unanimously endorsed at a meeting that approved a suggestion each grower be asked to contribute 50 cents per ton of strawberries and raspberries produced to assist in carrying out grower responsibilities in the farm-labour programme.

LAND SETTLEMENT BOARD

During the year the sales made by the Board amounted to $88,213. Ninety-one purchasers completed payment and received title deeds, and two borrowers paid up in full and received release of mortgage. Collections were as follows:——

Loans	$3,411.06
Land sales	51,340.60
Foreclosed properties and areas—rentals, etc.	902.80
Total	$55,654.46

The above figures include collections from the sale and rental of Doukhobor lands in the amount of $24,080.23.

LIVE STOCK BRANCH

A. Kidd, V.S., D.V.M., D.V.P.H., Live Stock Commissioner and Chief Veterinary Inspector

LIVE STOCK AND VETERINARY DIVISIONS

Acts

Animals Act

The Darfield-Mt. Olie Bull-control Area was approved on December 13th. There are fourteen bull-control areas, sixteen bull districts, and three stallion-control areas within the Province. Under the *Animals Act Amendment Act, 1962,* the definition of " artificial insemination centre " now includes any establishment where semen is collected, stored, or distributed for purposes of artificial insemination. In addition to the two semen-producing centres, twenty-four insemination centres have also been licensed. Fifty-nine technicians were licensed, of which four were newly licensed, following examinations in theory and practice held by the Board of Examiners.

Contagious Diseases (Animals) Act

The eradication of brucellosis from the cattle population of the Province continues at a rapid rate. During the year the South Okanagan, the Kamloops-North Okanagan, and the Cherryville Brucellosis-control Areas were declared certified brucellosis-free areas by the Health of Animals Division of the Canada Department of Agriculture. Through initial tests and retests the entire Province is certified brucellosis-free, except for the Cariboo-Central British Columbia-Peace River portion of the Province. As the entire Province has been turned over to the Canada Department of Agriculture to be certified brucellosis-free, it is likely this will be achieved in 1963 as Veterinary Inspectors of the Health of Animals Division are currently carrying out the initial tests of cattle in the remainder of the Province.

During the twelve-month period ended June 30th, there were 67,706 calves inoculated with brucella vaccine. The cumulative total from the time the Federal-Provincial brucellosis-control programme was established July 15, 1950, until June 30, 1962, now stands at 518,358 head. The total of calfhood vaccinations under the joint programme is listed in Appendix No. 1.

Payments to veterinary practitioners for services rendered during the calfhood vaccination year was $72,956. Total payments since the inception of free calfhood vaccinations on May 1, 1956, now amount to $367,404.

Vibriosis continues to be a sporadic problem in some beef-cattle herds. The ranchers are very conscious of this disease and are able to cope with it through improved management practices. For the first time, vibriosis of sheep was diagnosed on two sheep-ranches in the North Okanagan.

The Honourable the Minister of Agriculture appointed an Advisory Committee to recommend a course of action to ascertain the cause of bovine pulmonary emphysema (skyline disease or bog fever). A pulmonary emphysema project was set up and carried out on Tranquille Meadows, headed by a Veterinary Inspector of this Department. From the report compiled, substantial progress has been made during the first year, but a continuous series of yearly projects will be required in order to establish the complete etiology.

In the Smithers-Burns Lake area, 1,200 pregnant cows and 200 pregnant ewes were injected during January and February with selenium by a staff Veterinary Inspector in order to demonstrate the efficiency of this procedure to prevent white muscle disease (W.M.D.) in the calves and lambs born to the treated animals. The cows received 25 milligrams of selenium and the ewes 5 milligrams. One calf showed slight signs of W.M.D., and another calf, born five days after injection, showed severe W.M.D. Inoculation of this calf resulted in a cure. There were no deaths of offspring born from treated pregnant cattle and sheep. Owners, where W.M.D. occurs, are advised to carry out a regular programme of inoculations for the pregnant cow or ewe in order to prevent W.M.D. in the offspring.

Pink-eye continues to be a serious problem in some range areas, particularly in the vicinity of Kamloops.

Veterinary Inspectors carried out routine inspections for foot-rot on 16,697 sheep at twenty-four sheep-ranches before grazing permits were issued allowing sheep on Crown lands. Three flocks were quarantined until the foot-rot was cleaned up.

Fur-farm Act

A total of 539 fur-farm licences was issued and $5,355 collected. The numbers of breeding males and femals were: Mink, 113,472; chinchilla, 10,384; nutria, 414; fox, 39; and marten, 29. Inspectors made a total of 132 fur-farm visits.

Two fur-farms were quarantined because of distemper in mink. One quarantine was lifted, along with three carry-over quarantines from the previous year. One distemper quarantine remains in effect at the year-end.

Virus enteritis of mink was positively diagnosed on three farms in the Fraser Valley through the Animal Pathology Laboratory. In the five years virus enteritis has been present in this area, thirty-five farms have had a positive diagnosis. It is known the disease is occurring on other mink-ranches but is not being reported. Widespread use of vaccines for virus enteritis, distemper, and botulism is practised by the great majority of mink ranchers. Aleutian disease is currently a general problem and a serious situation for some mink-ranchers. Encouraging results with iodine agglutination test (I.A.T.) in diagnosing sub-clinical cases shows great promise for the control and eradication of Aleutian disease, and the experimental use of vaccines shows promise.

Meat Inspection Act

Establishments under Meat Inspection Service during the year were as follows:—

Establishment No.	Establishment and Location	Class	Federal Grading Service
1	Clappison Packers Ltd., Haney	A	Yes
2	Seed & Pitts Ltd., Pitt Meadows	B	Yes
3	Cariboo Meat Packing Co. Ltd., Prince George	A	Yes
4	Star Meat Co. Ltd., Abbotsford	B	Yes
5	Kohler's European Sausage Ltd., Aldergrove	A	Yes
6	Tommy Hong (T.H. Ranch), North Surrey	B	No
7	Cambie Stock Farms Ltd., Richmond	A	Yes
8	Sun Min Sang Co., Ladner	B	No
9	Borsato Meat Ltd., Langley	A	Yes
10	Delta Cold Storage, Ladner	B	No

Cariboo Meat Packing Co. Ltd. licence cancelled January 13th; Sun Min Sang Co. licence cancelled February 19th; T. H. Ranch licence cancelled February 21st; Kohler's European Sausage Ltd. licensed April 16th.

Total carcasses inspected after slaughter and condemnations for 1962 were as follows:—

	Carcasses Marked "B.C. Passed"	Carcasses Condemned	Total	Percentage Condemned	Portions Condemned
Cattle	8,355¼	63¾	8,419	0.757	1,419
Calves	17,125	789	17,914	4.404	623
Sheep	996	8	1,004	0.796	84
Lambs	552	1	553	0.180	79
Swine	16,376	20	16,396	0.122	4,484
Goats	45	.....	45	.....	3

Causes of carcass condemnation were as follows:—

Cause	Cattle	Calves	Swine	Sheep
Arthritis	1	----	----	----
Bruises	17¾	134	----	6
Emaciations and mucoid	19	45	----	3
Immaturity	----	399	----	----
Imperfect bleeding	----	23	----	----
Leukæmia	2	----	----	----
Mammitis	2	----	----	----
Metritis	2	----	2	----
Nephritis	1	73	----	----
Pericarditis	1	6	----	----
Peritonitis	6	33	1	----
Pneumonia and pleurisy	1	50	8	----
Septicæmia and pyemia	9	24	4	----
Abscesses	----	0	1	----
Erysipelas	----	0	3	----
Photosensitization	1	0	----	----
Blackleg	----	1	----	----
Corynebacterium infection	----	----	1	----
Dead in yard—ante-mortem	1	----	----	----
Septic arthritis	----	1	----	----
Totals	63¾	789	20	9

Milk Industry Act

The trend of more milk being produced on fewer dairy-farms continues, and the number of farm holding-tanks and pipe-line milkers being installed assists toward this end.

Veterinary Inspectors on seventy-eight dairy-farms examined 1,462 cows for clinical causes of mastitis and found 649. Of these cases, treatment was recommended for 474 cows and fifty-four were eliminated as incurable. In four herds, vaccination of the milking cows was recommended.

Two persons were charged under section 5 of the *Milk Industry Act* for illegal sale of milk and were assessed fines and costs.

Under provisions of section 6 (1), the described area covered by the South Okanagan Health Unit was approved as a milk pasteurization area on November 26th, the first in British Columbia and the first under the *Milk Industry Act.*

Appendix No. 2 contains the totals of dairy-farm inspections carried out, by districts, by Veterinary Inspectors and Dairy Farm Inspectors.

Sheep Protection Act

Compensation paid from the Dog Tax Fund for the years 1960, 1961, and 1962 is as follows:—

Year	Goats		Sheep		Poultry	
	Number	Compensation	Number	Compensation	Number	Compensation
1960	----	----------	263	$5,341.00	404	$665.06
1961	2	$42.50	197	3,767.00	685	574.21
1962	1	15.00	227	4,194.00	1,417	1,472.00

POLICIES

Artificial Insemination Assistance Policy

The Live Stock Inspector maintained his regular check of frozen-semen ampules at the British Columbia Artificial Insemination Centre, Milner, as required by the Joint Dairy Breeds Committee for pure-bred cattle.

Grants were made to the Young Sire Evaluation Programme at the British Columbia Artificial Insemination Centre. The annual grant toward sharing the building costs and fieldman services was continued. Special (and final) grants were made to the Alberni Farmers' Institute, the Bulkley Valley Cattle Breeders' Association, the Kamloops Artificial Insemination Association, and the Quesnel Artificial Insemination Association.

The Artificial Insemination Assistance Policy was enlarged to assist inseminating centres in the purchase of a frozen-semen cabinet, where difficulties encountered in transport of semen from the British Columbia Artificial Insemination Centre to the inseminating centres have made fresh-semen service impracticable.

Cattle Placement Policy

Seventeen head of grade Holstein cows and heifers and a young registered Guernsey bull calf were selected by the Live Stock Inspector from the Fraser Valley Dairy Herd Improvement Association herds and shipped to Telkwa, Saanich, and Quesnel. During the thirteen-year period of this policy, 803 head of dairy cattle have been selected and shipped.

Three registered Hereford yearling bulls were selected from Fraser Valley beef herds, and shipments arranged to Bella Coola, Lasqueti Island, and Graham Island in the Queen Charlottes.

Federal-Provincial Sheep Transportation Policy

Three shipments qualified, and 372 grade breeding ewes were transported. A total of $479.64 was refunded to the purchasers.

Live Stock Improvement Policy

Freight assistance was given on six pure-bred 4-H Ayrshire calves and one pure-bred ram transported into the Peace River Block.

Pure-bred Sires Purchase Assistance Policy

A total of seventeen bulls was bought—three Aberdeen-Angus, thirteen Herefords, and one Holstein.

Veterinary Service District Policy

Four veterinary service districts were serviced by veterinary practitioners located at Dawson Creek, Prince George, Smithers, and Williams Lake, and were paid the maximum grant.

GENERAL

Assisted by members of the Extension Branch, the Live Stock Branch sponsored five sheep-breeder field-days at Duncan, Dawson Creek, Prince George, Abbotsford, and Westwold, as well as a swine-breeders' short course at the Federal Experimental Farm, Saanichton. Staff assistance was provided at the sheepmen's conference, the bred gilt sale, and the carcass display at the Bull Sale.

In dairy-cattle feeding and management, lectures were presented by the Live Stock Inspector at Tomslake, Fort St. John, McBride, Smithers, Vanderhoof, Prince George, Quesnel, Cloverdale, Richmond, Saanich, and Metchosin.

Staff members participated in the activities of the Artificial Insemination Advisory Committee, the Beef Cattle Advisory Committee, the Sheep Steering Committee, the Bovine Pulmonary Emphysema Committee, and the Board of Examiners for artificial-insemination technicians.

The Assistant Live Stock Commissioner was present at the Royal Winter Fair in connection with the three carloads of British Columbia dairy cattle exhibited, and attended two meetings at Ottawa—one on R.O.P. beef cattle and the other on R.O.P. swine.

Practically all staff members, to varying degrees, have participated in civil defence activities. Three Veterinary Inspectors attended two veterinary indoctrination courses, and the Live Stock Commissioner attended the first senior administrative agriculturists' indoctrination course, all courses being at the Civil Defence College, Arnprior, Ont.

BRANDS DIVISION

(Thomas Moore)

Inspection Service

Brand inspection was carried out by the Royal Canadian Mounted Police at seventy-one shipping points and by Brand Inspectors and Deputy Brand Inspectors at twenty-six points.

Brand Inspection

A total of 153,651 head of cattle was inspected, an increase of 27,300 from 1961. Horses inspected numbered 8,548, an increase of 900. There were 15,264 hides inspected, an increase of seventy-one from 1961. Kamloops-Nicola area had 54,848 cattle inspected, an increase of 4,672 head. Cariboo cattle inspections totalled 33,361, an increase of 9,501. (*See* Appendix No. 3.)

Exports to United States

Total cattle exported from British Columbia to the United States from January 1st to December 31st numbered 27,686, of which 26,183 head moved from Interior points. This is 5,025 more than in 1961, and comprised 446 bulls, 1,685 cows, 15,312 steers, 3,708 heifers, and 5,032 calves. (Figures by courtesy of Health of Animals Division, Canada Department of Agriculture, Vancouver.)

Check Points

Shipments of stock, hides, and dressed beef are checked through these posts by the Department of Commercial Transport members, who are Deputy Brand Inspectors. Shipments checked are as follows:—

Flood—	1961	1962
Cattle	13,480	14,686
Horses	1,897	1,855
Hides	6,908	6,349
Dressed beef (quarters)	665	596
Number of trucks checked	1,979	1,868

	1961	1962
Fernie—		
Cattle	14,747	12,543
Horses	144	433
Hides	1,048	160
Number of trucks checked	687	628
Golden (August to November, 1962)—		
Cattle	.....	1,792
Horses	.....	52
Number of trucks checked	.....	80

Brand Book Supplement No. 2

The annual supplement, No. 2, to the Brand Book, showing all brands issued in 1962, will be compiled in 1963 and will be available later in the year.

Marketing of Cattle

Cattle in the Interior continue to be marketed mainly through sales held twice a month and in some cases weekly at Kamloops, Williams Lake, Quesnel, Okanagan Falls, Merritt, Dawson Creek, and Fort St. John during the heavier shipping season. McLeod Auction Sale, Alberta, has handled a lot of British Columbia cattle from the Kootenay area and several large shipments from Douglas Lake and Chilco ranches. The opening of the Rogers Pass has made a fast highway for stock to the Calgary market.

Dairy Farm Inspectors made 462 visits to farms, slaughter-houses, and auction sales in order to check that all persons dealing in stock are licensed.

Convictions under the Criminal Code

Eighteen convictions for theft of cattle and one for fraudulent possession of stray cattle were obtained by the Royal Canadian Mounted Police during the year of 1962.

Convictions under the Stock Brands Act

Twenty-two prosecutions were made under the above Act by the Royal Canadian Mounted Police and our Brand Inspectors. Nineteen convictions were obtained.

DAIRY HERD IMPROVEMENT SERVICES

(J. A. Mace)

Operation and Production

As at June 30, 1962, the same twenty-six routes were in operation as previously reported. They contained 554 herds and 19,112 cows. This is a decrease from a year ago of twenty-four herds and 149 cows. Average herd size showed a further increase of 0.2 to 34.5 cows. Decrease in the number of herds on test was caused by lowering the work-day requirements of D.H.I.A. supervisors from twenty-three per month to twenty-one.

Two major changes in rules concerning record reporting were instituted as of January 1, 1961. One was that the production of yearling and 2-year-old cows was reported as of the three hundred and fifth day of lactation (instead of up to 365 days as previously allowed), and the other that a cow's lactation belonged to the year in which occurred the three hundred and fifth day instead of the four hundredth day. These changes caused a major increase in the number of milking periods

reported in 1961, and it was anticipated that the loss of heifer production for sixty days would cause a lowering of the previous year's average.

Completed lactations number 20,376, an increase of 5,711; however, production showed an increase of 125 pounds to 10,725 pounds of milk, and the decrease was limited to 2 pounds of butterfat for an average of 435 pounds.

A summarized report of production by breeds is attached as Appendix No. 4.

Approximately 5,000 heifer calves will be identified by D.O.T. ear-tags in 1962.

Subsidy

During the fiscal year April 1, 1961, to March 31, 1962, subsidy payments to dairy herd improvement associations amounted to $56,210.

Reports

Lifetime production of cows on D.H.I.A. test continues to be reported. H.I.C. Stencil No. 89 will show details of those animals with over 2,500 pounds of butterfat to their credit.

Reports on the production of sires in A.I. units continue to be made, two reports for each breed being stencilled and distributed during the year.

A further increase in the productive ability of A.I. over non-A.I. cattle was shown in 1961, with the A.I. animals showing an increase of 2 percentage points for milk and 1 for fat over the preceding year, while the non-A.I. cows remained the same.

Summary

The Quesnel-Prince George route continues to lack sufficient members for fully efficient operation. While this is not desirable, it appears that it will be necessary to extend coverage to include the Vanderhoof area to overcome this situation.

Many herds still wish to come on D.H.I.A. routes which are presently unable to accommodate them, although this pressure has been somewhat alleviated by the institution of two private-owner sampler operations in the Fraser Valley, which are now testing approximately 100 herds with about 2,000 cows in them. This system of testing can give valuable information to participating herd-owners in the culling and feeding of their dairy herd.

ANIMAL PATHOLOGY LABORATORY

(Dr. J. C. Bankier, B.V.Sc.)

Assistance of other laboratories has been sought from time to time in conducting certain studies on specimen material which the Animal Pathology Laboratory is not equipped to handle. In this regard, the co-operation of the Federal Animal Pathology Laboratory, on the University of British Columbia campus; the Ontario Veterinary College, Guelph, Ont.; Connaught Medical Research Laboratories, Toronto, Ont.; and the Animal Diseases Research Institute, Hull, Que., is gratefully acknowledged.

Numerous meetings of live-stock and poultry owners and meetings related to Departmental work were attended by staff members. Field visits were made in connection with disease problems encountered in specimens submitted to the laboratory. Personal interviews in the laboratory with farmers or their representatives concerning disease problems numbered 1,013. The number of live-stock and poultry owners who received service on the basis of specimens submitted totalled 822. The total number of specimens examined was 9,276. (*See* Appendix No. 5.)

Some of the more important diseases encountered in submitted specimens were:—

Animal Species	Disease Encountered
Cattle	Aspergillosis, clostridiosis, coccidiosis, eosinophilic myositis, fungal infection in fœtus, listeriosis, lungworm, pasteurellosis, pulmonary emphysema, salmonellosis, staphylococcal mastitis, vibriosis.
Chinchilla	Giardosis, pasteurella pseudo-tuberculosis, sterility due to proteus infection of female reproductive tract.
Goat	Demodectic mange.
Horse	Joint-ill, tetanus.
Mink	Distemper, enterotoxæmia, plasmacytosis, rickets, salmonellosis, steatitis, tuberculosis, virus enteritis.
Rabbit	Mucoid enteritis, pasteurellosis.
Sheep	Coccidiosis, hookworm, listeriosis, pasteurellosis.
Swine	Erysipelas, pasteurellosis, salmonellosis.
Poultry	Aspergillosis, chronic respiratory disease, entero-hepatitis, epidemic tremor, erysipelas, infectious bronchitis, leucosis, moniliasis, Newcastle disease, pasteurellosis, salmonellosis, tuberculosis.

A detailed tabulation of findings in specimens examined is available upon request.

MARKETS AND STATISTICS BRANCH

M. M. GILCHRIST, B.S.A., MARKETS COMMISSIONER

SYNOPSIS

Increased production was a dominating feature of the agricultural economy in 1962, and resulted in a spotty market price structure for a number of the major crop items.

In spite of this, the index of farm prices (1935–39=100) displayed a rising tendency early in the year and remained buoyant throughout, reaching a high of 295.7 in October. The index average for the twelve-month period was 287.8, the second highest figure on record, exceeded only by the all-time high of 291.4 established in 1952. Higher returns from live stock, principally cattle, and from cereal grains were among the chief contributing factors to this development.

Reflecting these higher returns was the farm cash income from the sale of farm products, which reached a new record of $148,000,000, a gain of nearly $11,000,000 over the figure for 1961.

FEEDS

Decreased supplies of feed grains, resulting from the reduced harvest of the preceding year, forced prices upward during 1962. By midsummer feed wheat had increased by $8 per ton, oats by $6, and barley by $11. The improved supply position in the latter months of the year brought prices down. Feed wheat declined $5 from its top price and oats $14, while the barley price increase was wiped out.

Prepared feeds rose by about 5 per cent during the year, but hay and fodder prices remained steady throughout.

LIVE STOCK

Once again the market for live stock was dominated by higher prices for beef cattle, which by September had risen as much as $6 per hundredweight above the price one year earlier. This was a reflection of a continued strong demand, particularly for export, as a result of the devaluation of the Canadian dollar.

Exports of cattle continued to increase as a total of 27,690 head was shipped to United States points. This represented a gain of 31 per cent over the movement in 1961. The bulk of export traffic was again made up of feeder cattle.

A sharp increase of more than 60 per cent in shipments of cattle to Prairie points was noted this year. In all, nearly 44,000 head were shipped out, mainly for finishing.

Year-end population figures indicated a further increase in numbers of beef cows and heifers on farms as compared to totals of one year earlier, pointing to a continuation of the trend toward cow-calf operations among the Province's beef-growers.

Hog prices also showed substantial increases during the year, but production showed a change downward from 1961 levels. Hog numbers declined 8 per cent to a total of only 37,000 head at the end of the year.

In September the Federal Government announced a reduction of $1 on the $3 premium payable on Grade A hogs.

Sheep and lamb marketings showed a slight drop as prices remained relatively static until late autumn, when the market strengthened moderately.

Lambs came under support on a deficiency payment basis on July 1st. The support price was set at $18.80 per hundredweight for live lambs grading Good and Choice in the 36- to 56-pound dressed-weight range.

POULTRY AND EGGS

Higher feed costs coupled with lower egg prices presented difficulties for producers this year. While total egg production increased moderately, the average weighted price for all eggs sold fell to 30.9 cents per dozen, the lowest level of the entire post-war period. Egg deficiency payments amounted to 1 cent per dozen.

Total production of poultry meat was down fractionally from the 1961 output, but prices were slightly higher for chicken, particularly broilers. Turkey production decreased, chiefly in the medium-weight range, while average prices remained relatively unchanged.

Broiler marketings were down, but prices increased by 4½ cents per pound during the year.

DAIRY PRODUCTS

For the first time in recent years the continued trend toward annual increases in milk production appeared to have been halted. Preliminary estimates for 1962 place the dairy-cow population of the Province at 91,000 head, a decrease of 3,000 from the preceding year. This in turn reflected a continued decline in dairy-herd numbers and a further increase in average herd size.

While output of creamery butter rose by 22 per cent to a total of 7,215,000 pounds for the year, production of Cheddar cheese fell off 19 per cent to 979,000 pounds.

Manufacture of ice-cream totalled 4,576,000 gallons, while production of cottage cheese amounted to an estimated 6,800,000 pounds.

This year, for the first time, dairy-farmers in those areas under marketing control were declared eligible for the Federal Government subsidy of 25 cents per hundredweight for milk going into manufacture.

FRUIT

Increased yields of apples, peaches, and small fruits this year more than offset modest declines in other fruits to produce a substantial 16-per-cent rise in over-all production. An apple crop of over 120,000 tons was a major contributing factor to this increase.

For the greater part, sales were satisfactory, although a disproportionate percentage of larger sizes of apples created some difficulties. By the end of December, apple stocks had been reduced to about 2,370,000 boxes, following brisker movements in both Eastern and Western Canadian markets and in the United States than were experienced in 1961.

Apple sales to the United Kingdom were down slightly, due primarily to shortages of the smaller sizes preferred on that market.

Among highlights of the fruit-marketing picture in 1962 was the setting of an all-time record in the distribution of McIntosh apples in the popular Handi-pak carton. In all, sales totalled in excess of 1,500,000 packages.

Further progress was achieved in the development of the United Kingdom market for cherries, apricots, and peaches. Shipments of these amounted to 15,400, 9,985, and 32,400 packages respectively.

In the small-fruits field a firm demand continued for all types, particularly strawberries, blueberries, and cane fruits.

VEGETABLES

A cutback in planted acreages of corn, dried and seed peas reduced total vegetable production this year. Production of other vegetables was on a par with the average of recent years, although the general quality of some was adversely affected by the unseasonably cool weather encountered during the growing season. Prices were generally unchanged from the preceding year.

Signs of renewed activity in the growing of field tomatoes for the fresh market became evident this year as growers indicated decreasing interest in producing canning varieties. The cannery prices of $37 per ton for No. 1 grade and $18 for No. 2 failed to arouse sustained grower interest, and tomato acreage remained at a comparatively low level.

FIELD CROPS

An increase in seeded acreage combined with favourable growing conditions to produce a grain crop of over 11,000,000 bushels this year. This represented a gain of 15 per cent over the 1961 crop total, and was one of the largest on record. Prices were firm as sales continued at a brisk pace.

Production of forage-crop seed dropped sharply as much of the land previously cropped was diverted to the more readily marketable cereal grains. The total yield was below 3,000,000 pounds, as compared with 8,500,000 pounds one year ago.

Potato production declined by 12 per cent as a result of acreage cuts. Prices also dropped to less than $40 per ton in the face of low-priced imports. The value for duty import on United States potatoes, under which duty was based upon an arbitrary value of $2.65 per hundredweight, was imposed in mid-October.

MISCELLANEOUS

Cool summer temperatures and unsettled weather effectively reduced honey production to 1,450,000 pounds, a drop of 30 per cent from the record 1961 crop. Prices remained at an average of 21 cents per pound at wholesale.

The wool crop was down slightly as some 50,000 head produced 389,000 pounds. The average farm price was 48 cents per pound.

A feature of the 1962 ranch-fur market was the sale of thirty-seven matched B.C.-raised mink pelts at $2,886, an average of $78 per pelt. This was a new record price for mink pelts in North America. Total sales at auction in Vancouver this year exceeded $1,000,000.

PLANT PATHOLOGY BRANCH

W. R. Foster, M.Sc., Provincial Plant Pathologist

The year 1962 is notable for the dramatic development of several minor diseases. For example, most growers have never previously observed the disease botrytis on beans. There was also a sudden increase in the severity of early blight of tomatoes in the Northern Okanagan. The main predisposing factor that favoured the development of these minor diseases was excessive moisture.

DISEASES

Field Crops and Vegetables

Anthracnose of Tomatoes.—This disease was found for the first time in the Interior. It appears to be of minor importance.

Early Blight of Tomatoes.—This disease was the major problem in the canning industry of the Interior. The greatest losses were experienced in the Vernon area.

Botrytis of Beans.—This disease was widespread in the Lower Fraser Valley for the first time in many years. Prolonged wet weather in early August favoured the development of this disease and caused an estimated loss of about 20 per cent.

Bacterial Ring-rot of Potatoes.—Ten growers' potato crops are under detention, compared with twenty-seven the previous year. British Columbia has much less ring-rot than the rest of Canada.

Bacterial Soft-rot of Potatoes.—This disease has caused severe losses to growers whose potatoes were partially flooded at the Coast.

Tree Fruits

Apple Scab.—The incidence of scab was slight in the Interior and heavy at the Coast. The currently recommended fungicides adequately control this disease. There is some indication that two early applications of dodine (Cyprex) applied at appropriate times may be all that is necessary.

Perennial Canker of Apple.—This disease continues to be a problem in the Okanagan. For the first time three forms of this disease have been reported—(1) conventional perennial canker, (2) confused perennial canker, and (3) anthracnose. The Antonovka apple variety was adversely affected by the recently diagnosed confused perennial canker.

Powdery Mildew of Apple.—This disease was widespread and caused a considerable amount of russetting on the fruit in the Okanagan.

Coryneum Blight of Cherries.—This disease caused severe damage in the Abbotsford and Chilliwack districts.

Fireblight of Pears.—There has been a sudden increase in the incidence of this disease in some districts in the Okanagan during the last two years. The over-all loss was not great.

Trellis Rust of Pears and Junipers.—A new outbreak was found at Chilliwack, the first on the mainland of Canada. Fortunately this outbreak appears to be of recent origin. The incidence is slight and apparently is confined to an area bounded by Reece and Berkeley Avenues, Young Street North, and Corbould Street North. An eradication programme will begin during April, 1963.

The eradication programme of the first outbreak in North America at Victoria and district continues. Fifteen additional junipers were removed and destroyed. The rust fungus *Gymnosporangium fuscum* D.C. has been found on the following species of junipers: *Juniperus chinensis* L. var. *plumosa* Hornibr., *Juniperus sabina* L. var. *sabina, Juniperus sabina* L. var. *tamariscifolia* Ait., *Juniperus sabina* L. var. *variegata* (West.) Audib., *Juniperus squamata* Lamb. var. *fargesii* Rehd. and Wils., *Juniperus squamata* Lamb. var. *meyeri* Rehd., *Juniperus squamata* Lamb. var. *prostrata* Hornibr., and *Pyrus communis* L.

The rust was not recognized on *Juniper squamata* var. *meyeri* until the spring of 1962. The rust on certain pear-trees also indicates that another species is strongly suspected of being a host, *Juniperus communis* L. var. *hibernica* Gord., the Irish juniper. There was about a 70-per-cent reduction in the amount of rust on pear-trees in 1962 compared with 1961. The rust, however, is still well established and widely distributed in Oak Bay, Victoria, and Gordon Head.

Bacterial Canker of Cherry.—This disease was widely distributed at the Coast and caused considerable damage to young trees.

Small Fruits

Godronia Canker of Blueberry.—The incidence of this disease was very high. Experimental tests with four different fungicides applied at five different times failed to give any significant results.

Botrytis of Strawberry.—Fruit rot caused by *Botrytis* sp. was widespread in the Fraser Valley. Losses of 1 to 2 tons per acre were experienced in some districts.

Powdery Mildew of Strawberry.—The incidence of this disease was greater in the Fraser Valley than it has been for many years.

Ornamentals

Scab of Flowering Crab.—This disease was widespread and was severe enough to cause defoliation in the Fraser Valley.

Bacterial Blight of Japanese Flowering Cherry.—This disease was prevalent at the Coast.

POULTRY BRANCH

W. H. Pope, P.Ag., Poultry Commissioner

During 1962 the poultry industry of this Province has made an effort to adjust production to the market's demand. There has been some expansion of commercial egg production on Vancouver Island and Central Interior points to meet local requirements. Expansion has been accomplished by increasing flock size with a

general decrease in numbers of flocks. This is generally true throughout the Province as farms get fewer in number and larger in size. High feed costs coupled with record low prices for commercial eggs and fowl and marginal prices for turkey have taxed the ability and ingenuity of the most efficient producers to show minimum operating margins. Broiler production is the notable exception.

The following table shows the trend of poultry prices during the past five years:—

	Producer Price					1962 Price as Percentage of Five-year Average
	1958	1959	1960	1961	1962	
	¢	¢	¢	¢	¢	
Eggs	33.3	32.1	31.4	32.1	30.9	96.8
Chicken	25.0	22.2	21.4	17.9	23.0	103.1
Fowl	19.4	12.8	13.9	12.7	11.0	78.5
Turkey	33.0	24.0	31.1	26.1	26.0	92.8

COMMERCIAL EGGS

The heavy pullet-chick placement during the latter months of 1961 resulted in generous supplies of commercial eggs being available during the first nine months of 1962. Eggs handled through registered grading-stations reached an all-time high of 16,166 cases, or nearly one-half million dozen eggs during the week ended September 1st.

Egg Quality Study

A three-year study of factors that affect egg quality is in its terminal year. This study, jointly supported by the B.C. Feed Manufacturers' Association and the Department of Agriculture, has resulted in the publication of two reports, with a third and final report under preparation.

Egg Marketing

Again this year commercial egg-producers have attempted to evolve a marketing scheme under the *Natural Products Marketing (British Columbia) Act* acceptable to the majority of producers. The activities of the committee concerned have resulted in the formation of a Provincial organization known as the B.C. Egg Producers' Association. (For prices and production *see* Appendices Nos. 6 and 7.)

POULTRY-MEAT PRODUCTION

Broilers

The production and marketing of broilers and roasters have been the most stable and profitable part of British Columbia's poultry industry during 1962. Production in bird numbers has been reduced by about 7 per cent, but the reduction in the number of pounds of meat produced was slight. Birds marketed in 1962 averaged 5.5 per cent heavier than those marketed during the same period in 1961.

Fowl

Fowl continued to be a salvage product of commercial egg production, with prices to the producer bearing little relation to those charged at retail levels.

TURKEYS

Turkey production dropped sharply from 1961 levels, as egg settings for all weights were down about 20 per cent from 1961. High feed prices and several years of unsatisfactory returns contributed to this reduction. (For production and producer prices *see* Appendices Nos. 8 and 9.)

FLOCK APPROVAL POLICY

The success of this programme can be measured by the virtual elimination of pullorum disease as an economic factor from poultry flocks of British Columbia. While there have been occasional introductions of infected stock from the United States, these have been located and eliminated. All birds reacting to the field test have been submitted to the Provincial Laboratory for confirmation and possible isolation of the causative organism. (*See* Appendices Nos. 10, 11, and 12.)

DISEASE

Respiratory diseases of poultry were reported generally throughout the Province, with the greatest incidence in the Central Fraser Valley. Recognition and prevention or treatment was generally complicated by the presence of more than one disease producing entity in the affected flock.

There has been a sharp increase in the number of flocks reporting a high incidence of leucosis. This disease is becoming a serious factor in broiler flocks, with losses commencing as early as six weeks and condemnations at the killing plants running as high as 20 per cent in isolated lots. A request for a study of leucosis research and possible control measures was made to the Canada Department of Agriculture by the Canadian Poultry Commissioners in September of this year.

Epidemic tremors is widespread and is particularly serious in hatchery flocks because of the constant danger of spread through the hatching-eggs produced. It is probable that this disease has a greater economic significance to commercial egg producers than is presently recognized.

Available vaccines for respiratory diseases continued to be used widely by producers in the Fraser Valley, although total sales were down sharply from 1961, as indicated in Appendix No. 13.

There have been continued requests by producers and their organizations for additional laboratory facilities to increase the efficiency and scope of the diagnostic service.

FARM MANAGEMENT AND RECORD-KEEPING

Sixteen commercial egg-producers and thirty-three broiler-producers have participated in the farm management and record-keeping programme during 1962. The required records are being maintained and processed by the Nanaimo and New Westminster offices of this Branch. In addition to providing producers with an opportunity of determining their cost of production, this programme allows them to compare the efficiency of their operation with those of others in their area. All records are coded to prevent farm identification. Distribution of the summaries is limited to those participating.

This programme also provides this Branch with a current indicator of the economic well-being of these forms of poultry production.

PRODUCER-DISTRIBUTORS

The constantly diminishing production margin made it necessary for many relatively large commercial egg-producers to wholesale, and at times retail, all or part of their product in order to maintain an adequate return. The increase in this practice resulted in a softer price structure as attempts were made to gain new outlets for a reasonably large volume. This trend has created healthy competition at the wholesale level but has been responsible for a downward pressure on producer prices. In many instances, and this has been particularly true on Vancouver Island and in the Central Interior, eggs were produced at or about cost, and the producer derived his income from his marketing activities. It is likely that this trend will continue as production margins remain low.

PUBLICATIONS

As a result of recommendations made at poultry servicemen's workshops in late 1961, a series of six leaflets on poultry management were published in co-operation with the University of British Columbia. These publications cover egg quality, growing pullets, broiler breeders, laying flocks, vaccination, and replacement chicks. In co-operation and collaboration with the Department of Poultry Science, University of British Columbia, a bulletin entitled " Some Nutritional Aspects of Broiler Production " and a paper on the " Mineral Intake of Laying Birds in Relation to Rate and Quality of Egg Production " were published and distributed.

FIELD ACTIVITIES

Field service work with producers of various poultry products continued to occupy a major portion of the time and effort of this Branch.

As the industry has developed and farms have become larger, there has been a considerable change in the type of information sought. The problems of large farms require detailed analysis and careful programming to ensure reasonable continuity of high-level production. Consideration of such problems requires more time and care than was formerly necessary.

RANDOM SAMPLE TEST

The random sample test station on Marshall Road, Abbotsford, continued to satisfactorily perform the functions for which it was designed; that is, to measure the inherent productive capacity of poultry exposed for sale in the Province of British Columbia. The results of this programme are contained in the various reports published by and available from this Department.

In addition to production testing, two additional projects of interest to the industry have been or are being carried out:—

(1) A project to determine the effect of egg dipping on hatchability was undertaken. This work involved the use of the hatchery facilities when they were not being used for the production testing programme. Reports on the results are on file. Further work will be undertaken when the hatchery is again available.

(2) A study of the effects of the interaction of levels of nutrition, population density, and strain differences is being conducted in substitution for a broiler production test. This project was recommended by the Advisory Committee to the random sample test to replace the broiler test for one year.

As differences in the productive capacity of the various strains and kinds of poultry narrows, the facilities at the test station will be available for a wider range of investigation and demonstration.

SOIL SURVEY BRANCH

C. C. KELLEY, B.S.A., CHIEF

Field surveys in 1962 were in Matsqui Municipality and in the Thompson River valley from Ashcroft to Savona and Shuswap Lake area. A research project on forest-land classification was started in the Fly Hills region.

Interim reports and soil maps of Chilliwhack and Sumas Municipalities were completed. At Ottawa the editing of the report for publication " Soil Survey of the Kettle River Valley " is progressing. Two meetings of the Soils Advisory Committee and from two to three meetings of each of three subcommittees were held and reported. A meeting of the Reclamation Committee took place in the Ashcroft-Savona area in October. This was reported as Brief 41 of the Reclamation Committee in November. A member of the staff was appointed to a committee on post-graduate studies at the University of British Columbia. Two members were engaged at soils extension work.

MATSQUI MUNICIPALITY

A soil survey of Matsqui Municipality was started in May and will be continued in 1963. About 35,000 acres were classified in detail, and an additional 10,500 acres in unorganized territory on adjacent uplands also were classified, but on a reconnaissance scale of mapping. Representative soil-type profiles were described and sampled for analyses.

The lowland soils are derived chiefly from Fraser River flood-plain deposits of a nature similar to those in Chilliwhack Municipality, which was surveyed in 1961. Most of the soils were assigned to the Gleysolic, Regosolic, and Organic orders. These distinctions are due mainly to the different drainage conditions.

The soils of the uplands are derived from a mantle of loess which overlies glacial outwash, glacial till, and glacio-marine formations. The upland soils were assigned to the Acid Brown Wooded and Concretionary Brown soil groups.

ASHCROFT-SAVONA AREA

This area includes the Bonaparte Valley along the Cariboo Highway and the Thompson River valley between Ashcroft and Savona. The soil survey was undertaken at the request of the Comptroller of Water Rights as part of a combined soil and irrigation-water resource survey. About 51,000 acres were classified on a scale of 1,000 feet to an inch, of which 24,300 were graded as potentially irrigable. Eventually this map-area will be included in the general soil survey of the Thompson River valley.

The map-area is in the most arid part of British Columbia, the annual precipitation being around 8 inches. Most of the soils were assigned to the Brown soil group; a few Regosolic and Meadow soils also were differentiated. According to suitability for irrigation, about 75 per cent of the irrigable land was rated in the fourth and fifth classes. This is due to coarse texture-profiles, stoniness, shallow solums, and adverse topography. Salts occur in the subsoils of many of these soils, which could cause trouble when they are irrigated by forming accumulations in depressions or on lower slopes.

Information as to irrigation-water requirements, the most suitable crops and their probable yields was reported in Reclamation Committee Brief 41. An interim soil-survey report and soil maps of the area will be prepared in 1963.

SHUSWAP LAKE AREA

The survey extending westward from the Salmon Arm locality, started in 1961, was continued in 1962. About 23,000 acres were classified between Notch Hill and Adams River, including Turtle Valley and the lower part of the valley of Chase Creek. Very few new soil types were encountered.

Since the soil survey of the North and South Thompson River valleys and adjacent lands will take several years to complete, interim soil-survey reports and soil maps will be produced for use by co-operating agencies. These will fill the more immediate needs for soils information, and serve until published reports are available. An interim soil-survey report and soil map covering the Salmon River valley and the Salmon Arm area will be prepared in 1963.

FOREST-LAND CLASSIFICATION

Introductory work was done in 1962 in regard to the classification of land for forestry. Inasmuch as the Canadian system of soil classification was designed primarily for service to agriculture, research is necessary to determine what adjustments are necessary to make soil classification serve a useful purpose in forest management. The demand was from the Federal and Provincial Forest Services. Early in 1962 the Soils Advisory Committee appointed a sub-committee on forest-land classification. The sub-committee assigned a research project to the Soil Survey Branch.

The study consisted of the mapping of soils and natural vegetation on a transect a mile in width. The transect began in the Salmon River valley-bottom near Falkland, at about 1,800 feet elevation, and was to end near Bolean Lake, about 5,000 feet elevation. The area was chosen to include a wide range of soils and vegetation.

However, the time available for this purpose was too limited to complete more than 4 miles of a 10-mile strip. As far as the survey went, the soils were examined in detail, and descriptions of the natural vegetation also were taken. The age, height, and diameter of tree species were included at a number of locations to compile site indices on each classified soil. The information will be processed early in 1963 to determine if a satisfactory correlation is possible between mappable soil conditions and the volume of tree growth.

SOIL CONSERVATION

Soil testing of samples submitted by farmers, district officials, and others was continued in 1962. Some 660 samples were examined for alkali. Twelve per cent contained black and 14 per cent white alkali in concentrations harmful to plant growth. Thirty-three samples of water intended for irrigation were tested; 25 per cent were too alkaline for the purpose.

In the Okanagan Valley about seventy visits were made to farms with drainage problems. Plans were made for 9,000 feet of drainage-works, which were installed by December 1st, and plans for an additional 1,700 feet of drains are in progress.

In the Lower Fraser Valley thirty-one farms which occupy 1,163 acres were examined for drainage. This Branch co-operated with the Agricultural Engineering Branch in planning 175,991 feet of tile drains and 18,700 feet of ditches.

Water-table studies and hydraulic conductivity measurements were undertaken at nine locations in the Lower Fraser Valley to determine the most economic spacing between Tile drains in different soils. Studies of sub-surface drainage conditions and subsidence of peat and muck soils when drained and cultivated were undertaken. An inventory of drainage-works and the preparation of a proposed drainage extension programme has been started.

In the Okanagan Valley there was an increased demand in 1962 for advisory assistance in regard to irrigation. Some seventy-three farm visits were made to check sprinkler systems, application rates, irrigation intervals, and soil water requirements. Co-operation was continued with irrigation districts and the Canada Research Station, Summerland, the emphasis being on flow control, irrigation requirements of soils, and the overhead irrigation of grapes and dwarf-tree fruits.

Other duties included lectures to farm audiences, irrigation workshops, television programmes, the Soils Advisory Committee Sub-committee on Land Drainage, and advisory assistance to the Water Rights Service on water requirements of soils in relation to applications for water rights by ranchers and farmers.

LABORATORY

Laboratory analyses completed in 1962 included examination of soil samples collected from the Shuswap Lake area in 1961, and 1962 samples from the Ashcroft-Savona area. Clays were separated from four soil profiles from the Shuswap Lake area. Arrangements for X-ray analyses to determine the nature of these clays is in progress. Many soil and water samples brought in by district officials, farmers, and others were tested for harmful content of alkali.

In the winter of 1962/63 laboratory investigations were started as a preliminary step in the development of soil-testing procedures for soils in different parts of the Province. This will include a study of the nature of nutrient element compounds and their distribution in the soil groups of classified areas.

SOUTHERN OKANAGAN LANDS PROJECT

F. O. McDonald, Manager

Mild winter weather permitted the refilling of cisterns in the first week of February, and water was turned into the system in mid-April, with all nine pumps in operation. Services were further increased to 7 industrial, 84 commercial, and 562 residential customers.

For the fourth consecutive year, another 3,000 feet of waterproofing with fibreglass and asphalt was carried out. Replacement of wooden flumes with half-round steel sheets was continued.

Construction of 1,300 feet of new flume was commenced this year, as well as the first stage of a drainage project on Osoyoos West Bench. An additional 150 acres, comprising the Reed, Hester, Testalinda, and Tinhorn Creek fans, have been surveyed and will be serviced shortly.

The committee conducting experiments on irrigation factors on soils in the Oliver-Osoyoos area submitted an interim report on findings to date. Indications point to the possibility of a considerable saving in future volumes of water application in this area.

APPENDICES

APPENDIX No. 1

Calfhood Vaccinations under Federal-Provincial Brucellosis Control

Period	Total Vaccinations
July 15, 1950, to June 30, 1951	18,929
July 1, 1951, to June 30, 1952	24,178
July 1, 1952, to June 30, 1953	29,605
July 1, 1953, to June 30, 1954	34,105
July 1, 1954, to June 30, 1955	36,815
July 1, 1955, to June 30, 1956	36,412
July 1, 1956, to June 30, 1957	39,230
July 1, 1957, to June 30, 1958	47,087
July 1, 1958, to June 30, 1959	58,896
July 1, 1959, to June 30, 1960	59,945
July 1, 1960, to June 30, 1961	65,450
July 1, 1961, to June 30, 1962	67,706
Totals	518,358

Total calves vaccinated under the Provincial policy during the period from July 31, 1941, to July 14, 1950, was 83,730 head.

APPENDIX No. 2

Dairy-farm Inspections under Milk Industry Act

District	Number of Dairy-farm Inspections	Number of Dairy-farms Issued Notice of Cancellation by Inspectors		Number of Approved Dairy-farms	
		Raw	Fluid	Raw	Fluid
East Kootenay	157	4	9	3	42
West Kootenay	157	----	13	9	31
North Okanagan	667	1	4	1	136
South Okanagan	344	1	1	----	71
Central British Columbia	466	----	21	5	133
Fraser Valley	2,679	----	87	----	2,014
Vancouver Island	712	2	7	25	243
North Bend	5	----	----	1	------
Pemberton-Sechelt	33	----	----	3	5
Sandspit	1	----	----	1	------
Totals	5,221	8	142	48	2,675

Four hundred and forty-seven additional notices of cancellation were mailed out in Milk Board areas where the dairy-farmer notified the Board of cessation of operations.

Twenty-two visits were made to issue warning where milk was deemed to be sold illegally.

APPENDIX No. 3

Cattle and Hide Shipments, 1962

District	Cattle	Hides
Cariboo—		
Quesnel	3,330	512
Williams Lake, Alexis Creek	21,417	331
Clinton, Lac la Hache, 100 Mile House, Graham Siding, Bridge Lake, Lone Butte	7,804	42
Lillooet, Pavilion, Bralorne, Pemberton	798	1
Bella Coola	12	10
	33,361	896
Kamloops, Nicola, etc.—		
Kamloops, Chase	30,791	609
Merritt	11,138	216
Ashcroft, Lytton, etc.	10,757	37
Salmon Arm	2,152	1,057
	54,838	1,919
Okanagan—		
Vernon, Lumby, Falkland	8,373	1,630
Armstrong, Enderby, Sicamous	4,232	601
Kelowna	4,033	3,076
Penticton, Summerland	937	33
Oliver, Osoyoos	2,738	747
	20,313	6,087

District	Cattle	Hides
Similkameen—		
Princeton, Keremeos, etc.	7,723	219
Grand Forks, Greenwood	3,816	371
	11,539	590
South-eastern British Columbia—		
Rossland, Crescent Valley	543	357
Nelson, Creston, etc.	1,891	981
Cranbrook, Fernie, etc.	6,533	364
Invermere, Golden	1,498	100
	10,465	1,802
Central British Columbia—		
Prince George, Vanderhoof	2,845	347
Smithers, Giscome, etc.	2,026	510
Burns Lake	1,840	73
	6,711	930
Peace River—		
Fort St. John	5,296	665
Dawson Creek	11,128	2,375
	16,424	3,040

Totals Compared

District	1962		1961		1960	
	Cattle	Hides	Cattle	Hides	Cattle	Hides
Cariboo and South	33,361	896	23,860	776	20,786	845
Kamloops and Nicola	54,838	1,919	50,176	2,084	47,279	1,965
Okanagan and Similkameen	31,852	6,677	27,029	5,698	25,976	4,579
South-eastern British Columbia	10,465	1,802	8,945	2,166	7,784	1,970
Central British Columbia and Peace River	23,135	3,970	16,341	4,469	13,835	4,630
Totals	153,651	15,264	126,351	15,193	115,660	13,989

APPENDIX No. 4

Breed Averages for 1960 and 1961

Breed	Percentage of Total D.H.I.		Milk (Pounds)		Fat			
					Per Cent		Pounds	
	1960	1961	1960	1961	1960	1961	1960	1961
Ayrshire	3.2	3.0	9,321	9,507	4.13	4.03	385	383
Guernsey	13.3	11.5	8,918	8,737	4.84	4.81	431	420
Holstein	60.7	64.3	11,735	11,805	3.80	3.77	446	445
Jersey	14.2	12.8	7,864	7,840	5.21	5.20	410	408
Unclassified (cross-breds, etc.)	8.6	8.4	10,181	10,011	4.35	4.33	443	434

APPENDIX No. 5

Animal Pathology Specimen Examinations

Specimens	Chickens	Turkeys	Cattle	Horses	Sheep	Swine	Fur-bearers	Miscel-laneous	Total
Miscellaneous	3,266	755	388	33	31	27	331	639	5,470
Serology	3,086	302	.....	.....	.....	.....	418	.....	3,806
Grand totals	6,352	1,057	388	33	31	27	749	639	9,276

APPENDIX No. 6

Egg Production

(Number of cases through registered stations.)

Month	A.E.L.	A.L.	A.M.	A.S.	A.P.W.	B	C	CRAX	Estimated Totals, 1962	Totals, 1961
January	2,127	43,642	17,897	2,397	136	2,597	600	3,978	73,374	63,892
February	1,620	34,782	12,157	1,999	132	2,527	474	3,261	56,952	50,755
March	1,795	35,507	11,265	1,702	106	2,386	455	3,246	56,462	50,823
April	1,882	35,817	10,734	1,878	145	2,265	509	3,403	56,633	52,097
May	2,526	45,361	15,052	3,347	259	3,259	745	4,802	75,351	65,576
June	1,865	35,802	13,023	2,983	257	2,898	625	3,894	61,347	53,322
July	1,733	33,513	13,163	3,714	307	3,035	670	4,231	60,366	52,497
August	2,064	40,989	19,087	4,832	364	3,551	638	5,141	76,666	70,488
September	1,742	32,989	14,879	3,387	321	2,418	519	3,760	60,015	56,635
October	1,861	33,913	14,264	3,270	299	2,275	493	3,797	60,172	57,110
November	2,537	42,285	18,221	3,754	312	2,668	604	4,606	74,987	67,334
December	2,196	36,655	14,060	2,273	179	2,141	398	3,468	61,370	54,402
Totals	23,948	451,255	173,802	35,536	2,817	32,020	6,730	47,587	773,695	694,931

APPENDIX No. 7

British Columbia Weighted Egg Price per Dozen to Producers

(Average paying price weighted by grade.)

Month	1962	1961	1960	Canada, 1962
	¢	¢	¢	¢
January	30.9	32.0	26.4	24.4
February	28.5	29.5	25.9	29.6
March	29.3	30.8	33.6	30.4
April	31.4	28.5	34.2	29.1
May	28.8	29.0	32.6	24.2
June	26.0	29.7	29.9	23.6
July	26.5	33.9	29.9	24.5
August	32.2	34.6	31.2	34.2
September	34.4	33.1	34.2	33.1
October	32.9	34.2	33.4	36.6
November	34.8	36.6	34.1	38.2
December	33.8	32.5	35.5	30.6
Yearly average	30.9	32.1	31.4	29.9

APPENDIX No. 8

Poultry in Pounds through Registered Stations in British Columbia

Month	Chicken	Fowl	Turkey	Duck	Geese	Monthly Totals, 1962	Five-year Averages 1957–61
January	1,202,666	442,330	420,638	13,765	1,512	2,080,911	1,788,008
February	1,433,137	346,428	94,022	13,005	.....	1,886,592	1,437,295
March	1,457,918	337,557	95,836	16,641	.....	1,907,952	1,434,989
April	1,759,740	236,838	362,137	20,813	.....	2,379,528	1,685,464
May	2,654,804	451,567	272,447	30,853	.....	3,409,671	2,180,391
June	1,892,648	431,249	302,880	26,770	.....	2,653,547	2,098,173
July	2,035,229	430,648	302,867	25,798	.....	2,794,542	2,007,319
August	2,370,640	452,806	1,042,856	34,971	.....	3,901,273	2,861,612
September	1,915,420	466,873	1,178,836	41,529	.....	3,602,658	3,013,901
October	1,513,751	469,750	1,419,331	32,688	.....	3,435,520	3,297,495
November	1,968,887	508,583	1,630,135	23,048	.....	4,130,653	3,167,528
December	1,236,202	388,489	1,302,170	16,162	113	2,943,136	2,586,838
Yearly totals	21,441,042	4,963,118	8,424,155	296,043	1,625	35,125,983	27,559,013

APPENDIX No. 9

1962 Average Monthly Producer Price per Pound for Live Poultry (Vancouver)

Month	Chicken				Fowl			Young Turkey		
	Under 4 Lb.	4–5 Lb.	5–6½ Lb.	6½ Lb. and Over	Under 5 Lb.	5–6 Lb.	Over 6 Lb.	Under 10 Lb.	10–20 Lb.	Over 20 Lb.
	¢	¢	¢	¢	¢	¢	¢	¢	¢	¢
January	19	19	20	21	10	10	13	27	25	22
February	20	20	20	23	10	10	13	28	26	22
March	20½	20½	20½	24½	11	11	13	29	27	23
April	21½	21½	21½	25	10	11	13	30	28	26
May	21½	21½	21½	25	9	11	13	30	28	26
June	22	22	22	27	9	10	13	30	28	28
July	22½	22½	22½	26	9	9	12	30	30	30
August	22½	22½	22½	26	10	10	13	30	28	28
September	22½	22½	22½	27	10½	11	14	29	29	26
October	22½	22½	22½	27	10½	13	14	28	28	25
November	22½	22½	22½	27	11	13	14	28	28	25
December	22½	22½	22½	27	10	13	14	28	27	25

APPENDIX No. 10

Poultry-flock Approval

	Number of Flocks	Number of Birds Pullorum-tested	Average Number of Birds per Flock	Per Cent Reactors
1962	128	228,816	1,787	0.0664
Five-year average, 1957 to 1961, inclusive	136	251,493	1,771	0.0412

APPENDIX No. 11

Summary of Poultry-flock Testing, 1962

	Number of Premises	Number of Chickens
Approved for egg production	54	90,736
Approved for meat production	81	135,353
Total poultry approved	128[1]	226,089
Tested as commercial layers	1	204
Poultry retested	5[2]	2,371
Pullorum disease reactors—		
Egg production stock	7	18
Meat production stock	9	134
Total poultry tested	128	228,816

[1] Seven premises with both egg- and meat-type breeders.
[2] Three premises retested as a result of 1962 testing and two premises as a carry-over from 1961 testing.

APPENDIX No. 12

Turkey-flock Approval

	Number of Flocks	Number of Birds Pullorum-tested	Average Number of Birds per Flock	Per Cent Reactors
1962	7	9,584	1,369	.....
Five-year average, 1957 to 1961, inclusive	19	16,211	871	0.006

APPENDIX No. 13

Amount and Kind of Vaccine Distributed

Type of Vaccine	1962	1961	1960	1959	1958
Newcastle disease	10,674,636	13,751,400	8,829,800	8,747,150	6,171,710
Infectious bronchitis	2,442,436	3,184,900	1,816,600	1,851,450	1,986,000
Totals	13,117,072	16,936,300	10,646,400	10,598,600	8,157,710

APPENDIX No. 14

Production of Tree-fruit Crops in British Columbia for 1961 and an Estimate for 1962

	1961 Production (Lb.)			1962 Estimate of Total Production
	Fresh Sales	Processed Sales	Total Production	
Apples	158,530,000	34,035,000	192,565,000	243,441,000
Crab-apples	841,000	769,000	1,610,000	2,295,500
Pears	24,165,000	6,314,000	30,479,000	29,166,500
Plums	339,000	26,000	365,000	378,606
Prunes	8,015,000	3,245,000	11,260,000	13,396,900
Cherries	7,945,000	1,092,000	9,037,000	9,241,300
Peaches	15,391,000	11,158,000	26,549,000	30,759,600
Apricots	9,410,000	3,859,000	13,269,000	15,135,800
Totals	224,636,000	60,498,000	285,134,000	343,815,206

APPENDIX No. 15

Grape Varieties and Acreage in the Okanagan Valley, 1962

	1–4 Years		Over 4 Years		Total	
	Number of Plants	Acres	Number of Plants	Acres	Number of Plants	Acres
Campbell Early	20,400	40.26	34,744	59.87	55,144	100.13
Concord	1,395	2.56	46,814	74.61	48,209	77.17
Diamond	119,965	230.00	19,970	35.78	139,875	265.78
Fredonia	.....	.....	4,695	7.36	4,695	7.36
Niagara	55	0.19	1,058	1.95	1,113	2.14
Patricia	19,275	38.00	20,985	39.24	40,260	77.24
Portland	450	0.89	18,740	34.33	19,190	35.22
Sheridan	19,010	34.91	13,687	24.35	32,697	59.26
Bath	970	1.75	.....	.....	970	1.75
Himrod	18,816	33.44	130	0.10	18,946	33.54
Buffalo	5,310	10.67	1,040	2.00	6,350	12.67
Hybrids	32,603	61.24	.....	.....	32,603	61.24
Mixed	3,720	6.78	16,581	23.62	20,301	30.40
Totals	243,648	463.84	192,918	329.50	436,566	793.34

APPENDIX No. 16

Small-fruit, Grape, and Filbert Production in British Columbia for 1961 and an Estimate for 1962

	Fresh	Processed	Total Production	1962 Estimate of Total Production
	Lb.	Lb.	Lb.	Lb.
Strawberries	1,506,000	6,498,000	8,004,000	10,384,000
Raspberries	701,000	6,899,000	7,600,000	8,699,000
Loganberries	191,000	1,012,000	1,203,000	1,022,000
Blackberries	52,000	425,000	477,000	287,000
Black Currants	28,000	17,000	45,000	31,000
Red Currants	20,000	.....	20,000	56,000
Gooseberries	19,000	29,000	48,000	19,000
Blueberries	759,000	1,004,000	1,763,000	1,909,000
Cranberries	.....	404,000	404,000	190,000
Grapes	1,225,000	2,378,000	3,603,000	3,421,000
Filberts	303,000	.....	303,000	267,000
Totals	4,804,000	18,666,000	23,470,000	26,285,000

APPENDIX No. 17

Tree-fruit Nursery-stock Production in British Columbia

	1958	1959	1960	1961	1962
Apples	357,100	307,337	148,258	178,921	158,510
Pears	59,965	48,277	27,997	47,278	42,657
Cherries	46,875	35,083	15,566	52,685	46,238
Plums and prunes	4,700	9,984	8,942	15,586	12,153
Peaches	12,630	44,356	26,857	37,699	36,694
Apricots	3,410	4,245	3,262	8,077	5,265
Totals	484,680	449,282	230,882	340,246	301,517

APPENDIX No. 18

Number and Percentage of Various Apple Rootstocks Grown in British Columbia in 1962

Type	Number				Approximate Percentage			
	1959	1960	1961	1962	1959	1960	1961	1962
EM II	79,641	28,609	50,760	50,288	26.0	19.2	28.4	31.7
EM IV	7,200	920	740	1,710	2.3	0.62	0.4	1.1
EM VII	58,489	42,689	38,357	32,928	19.0	28.0	21.4	20.7
EM IX	16,335	12,058	7,787	6,397	5.3	8.1	4.4	4.0
EM XVI	.....	515	350	.....	.....	0.34	0.2	.....
MM 104	895	1,558	6,288	15,619	0.3	1.5	3.5	9.9
MM 106	3,650	1,827	2,950	2,553	1.2	1.2	1.6	1.6
MM 109	3,110	1,075	937	370	1.1	0.72	0.5	0.2
MM 111	1,915	532	3,120	2,480	0.6	0.35	1.7	1.6
Seedling (McIntosh)	122,411	45,845	46,613	36,287	40.0	31.0	26.0	22.9
Other rootstocks	.....	.....	.....	9,978	.....	.....	.....	6.3

APPENDIX No. 19

Production of Grass and Legume Seeds, 1961–62

	Production (Final) 1961	Estimated Production 1962
	Lb.	Lb.
Alfalfa	165,000	150,000
Red clover, single	600,000	160,000
Red clover, double	150,000	60,000
Alsike clover	2,541,000	750,000
Sweet clover	405,000	250,000
White Dutch clover	65,000	10,000
Timothy	210,000	75,000
Timothy-alsike	120,000	75,000
Brome	200,000	200,000
Blue-grass, Kentucky	7,300	16,000
Crested wheat	58,000	45,000
Creeping red fescue	4,000,000	1,000,000
Meadow fescue	19,000	15,000
Orchard-grass	1,000	.....
Red-top	612	.....
Chewing's fescue	14,000	300
Birdsfoot trefoil	1,800	.....
Ryegrass, perennial	.....	6,000
Ryegrass, annual	.....	2,000

APPENDIX No. 20

Publications Printed in 1962

Reports

Annual Report of the Department of Agriculture, 1961.
The Climate of British Columbia, 1961.
Annual Report of the Milk Board, 1961.

Bulletins

Raising Sheep in British Columbia.
Burning Tree Stumps with the Help of Chemicals.
Practical Rabbit Raising.
Land Clearing Equipment and Methods.
Minimum Requirements for the Design, Installation, and Performance of Sprinkler Irrigation Equipment.
Red-stele of Strawberries.
Loose Housing of Dairy Cattle.
Tractor Service Manuals.
Door of Opportunities in Agriculture.
Growing Outdoor Chrysanthemums in British Columbia.
Damping-off of Vegetables and Flowers.
Carpet Beetles.
Insect Control for the Home Gardener.
Livestock Pests.
Bibliography on Rural Electrification.
Bloat: What? Why? When? How?
Silage Harvesting Machinery.
Horticultural Recommendations for the Peace River Region of British Columbia.
Practical Goose Raising.
2,4-D Susceptible Crop (leaflet and poster).
Mushroom Culture in British Columbia.
Black Knot of Plums.
Highbush Blueberry Culture in British Columbia.
Soil Reaction.
Chemical Weed Control around the Home.
Loose Stall Housing.
Holly Culture in British Columbia.
Asparagus Production in British Columbia.

Charts

Control of Small Fruit Pests and Diseases, 1962–63.
Fertilizer Recommendations for the Lower Mainland, Zone 2 (reprint).
Tree-fruit Spray Calendar, Interior Districts, 1962.
Control of Vegetable and Field Crop Pests and Diseases, 1962–63.
Vegetable Varieties Recommended for the Lower Mainland and Vancouver Island.
Chemical Weed Control, 1961–63 (reprint).

Miscellaneous

List of Publications.
Mineral Intake of Laying Birds in Relation to Rate and Quality of Egg Production.

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