PROVINCE OF BRITISH COLUMBIA

Department of Agriculture

FIFTY-SIXTH

ANNUAL REPORT

1961

Printed by A. SUTTON, Printer to the Queen's Most Excellent Majesty
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1962

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 1961.

FRANK RICHTER,
Minister of Agriculture.

Department of Agriculture,
Victoria, B.C.

BRITISH COLUMBIA DEPARTMENT OF AGRICULTURE

DEPARTMENTAL STAFF, 1961

Minister of Agriculture:
Honourable FRANK RICHTER

Minister's Secretary:
Miss M. JEWELL

Deputy Minister:
WM. MACGILLIVRAY

Administrative:

N. L. CAMSUSA, Administrative Assistant, Victoria.
J. S. WELLS, Accountant, Victoria.
T. T. VAULKHARD, Clerk, Accounts Branch, Victoria.
B. K. OXENDALE, Clerk, Publications Branch, Victoria.

Markets and Statistics:

M. M. GILCHRIST, B.S.A., Markets Commissioner, Victoria.
M. A. CRONKHITE, B.S.A., Farm Management Adviser, Victoria.

Horticulture:

A. C. CARTER, B.S.A., Provincial Horticulturist, Victoria.
J. A. SMITH, B.S.A., Supervising Horticulturist, Kelowna.
D. A. ALLAN, B.S.A., District Horticulturist, Oliver.
M. G. OSWELL, B.S.A., District Horticulturist, Vernon.
I. C. CARNE, B.S.A., District Horticulturist, Abbotsford.
A. E. LITTLER, B.S.A., District Horticulturist, Victoria.
W. F. MORTON, B.S.A., District Horticulturist, Kelowna.
J. E. SWALES, B.S.A., District Horticulturist, Creston.
G. R. THORPE, B.S.A., District Horticulturist, New Westminster.
M. P. D. TRUMPOUR, B.S.A., M.S.A., District Horticulturist, Penticton.
A. W. WATT, B.S.A., District Horticulturist, West Summerland.
R. M. WILSON, B.S.A., District Horticulturist, Kelowna.
B. A. HODGE, B.S.A., Horticulturist (Vegetables), Vernon.
J. L. WEBSTER, B.S.A., Horticulturist (Vegetables), Vancouver.
W. D. CHRISTIE, B.S.A., Horticulturist (Greenhouse and Nursery Crop), Abbotsford.
E. M. KING, B.S.A., M.S.A., Horticulturist (Vegetables), Kelowna.

Apiary:

J. CORNER, Provincial Apiarist, Court-house, Vernon.

Plant Pathology:

W. R. FOSTER, B.Sc., M.Sc., Plant Pathologist, Victoria.
J. A. MOISEY, B.A., M.Sc., Assistant Plant Pathologist, Kelowna.

Entomology:

C. L. NEILSON, B.S.A., M.Sc., Provincial Entomologist, Victoria.
J. C. ARRAND, B.S.A., M.Sc., Assistant Entomologist, Vernon.

Live Stock:

A. KIDD, D.V.M., V.S., D.V.P.H., Live Stock Commissioner and Chief Veterinary Inspector, Victoria.
J. C. BANKIER, B.V.Sc., Veterinary Inspector and Animal Pathologist, Vancouver.
E. V. LANGFORD, D.V.M., V.S., D.V.P.H., Veterinary Inspector and Assistant Animal Pathologist, Vancouver.

Live Stock—Continued

F. C. CLARK, B.S.A., M.S.A., Live Stock Inspector, New Westminster.
T. MOORE, Recorder of Animal Brands, Victoria.
T. J. BATTEN, Brand Inspector, Nicola.
A. J. DUCK, Brand Inspector, Kamloops.
R. PIGEON, Brand Inspector, Williams Lake.
P. G. LAWRENCE, Inspector, Vancouver.
S. MUNRO, Deputy Brand Inspector, Clinton.
I. D. C. CLARK, D.V.M., V.S., Veterinary Inspector, Kamloops.
R. L. LANCASTER, D.V.M., V.S., Veterinary Inspector, Abbotsford.
J. MUSTARD, D.V.M., V.S., Veterinary Inspector, New Westminster.
W. C. NEWBY, D.V.M., V.S., Veterinary Inspector, Abbotsford.
K. H. THOMPSON, D.V.M., V.S., Veterinary Inspector, Prince George.
C. C. CUNNINGHAM, B.S.A., D.V.M., V.S., Veterinary Inspector, Nelson.
J. A. MACE, Superintendent, Dairy Herd Improvement Association, Victoria.
H. JOHNSON, Inspector, Dairy Herd Improvement Association, Abbotsford.
J. R. HANNAM, Inspector, Dairy Herd Improvement Association, Chilliwack.
Mrs. A. B. MAH, B.Sc., Bacteriologist, Vancouver.
R. J. WEIR, Clerk, Live Stock Branch, Victoria.
W. H. BURR, Dairy Farm Inspector, Abbotsford.
K. G. FLETCHER, Dairy Farm Inspector, Abbotsford.
A. L. KIRKBY, Dairy Farm Inspector, Nanaimo.
B. R. STEWART, Dairy Farm Inspector, Chilliwack.
J. J. COMLEY, Dairy Farm Inspector, Vernon.

Dairy:

K. G. SAVAGE, B.S.A., M.Sc., Dairy Commissioner, Victoria.
R. N. HITCHMAN, B.S.A., Dairy Inspector, Prince George.
N. H. INGLEDEW, B.S.A., M.S.A., Dairy Inspector, Nelson.
G. D. JOHNSON, Dairy Inspector, Kelowna.
P. REGEHR, B.S.A., Dairy Inspector, Victoria.
C. RIVE, B.S.A., Dairy Inspector, Vancouver.

Poultry:

W. H. POPE, Poultry Commissioner, Victoria.
H. C. GASPERDONE, B.S.A., Poultry Inspector, New Westminster.
N. J. SUPEENE, B.S.A., Poultry Inspector, Abbotsford.
C. W. WOOD, B.S.A., Poultry Inspector, Kelowna.
D. M. HAMILTON, B.S.A., Poultry Inspector, Nanaimo.
R. C. BENTLEY, Resident Supervisor, Random Sample Poultry Test Station, Abbotsford.

Field Crops:

N. F. PUTNAM, B.Sc., M.Sc., Field Crops Commissioner, Victoria.
C. H. NELSON, B.S.A., Assistant Field Crops Commissioner, Victoria.
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 of Farmers' Institutes, Victoria.

Soil Survey:

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

Agricultural Development and Extension:

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

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.
Inspector: I. SPIELMANS, Nelson.

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.
L. KING, Farm Foreman, Tranquille.
P. CUMMINS, Farm Foreman, Colquitz.
D. F. CALDOW, Farm Foreman, Essondale.

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.
E. D. DAUM, Accountant, Vancouver.
R. E. D'EASUM, Inspector, Vancouver.
J. W. MCINTOSH, Inspector, Vancouver.
A. S. DIXON, Inspector, Nanaimo.
G. CROTHERS, Inspector, Kelowna.

TABLE OF CONTENTS

PAGE

Report of the Deputy Minister 11

Report of Markets and Statistics Branch 13

Report of Horticultural Branch 16

Report of Plant Pathology Branch 21

Report of Entomology Branch 22

Report of Apiary Branch 25

Report of Live Stock Branch 26

Report of Dairy Branch 34

Report of Poultry Branch 37

Report of Field Crops Branch 39

Report of Farmers' Institutes 42

Report of Soil Survey Branch 43

Report of Agricultural Development and Extension Branch 45

Report of Southern Okanagan Lands Project 51

Report of Land Settlement Board 52

Report of Dyking and Drainage 52

Appendices—

No. 1. Slaughter in Abattoirs Licensed under the Stock Brands Act and Provincial Meat Inspection Act 53

No. 2. Dairy-farm Inspections under Milk Industry Act 53

No. 3. Cattle and Hide Inspections 54

No. 4. Breed Averages for 1960 54

No. 5. Animal Pathology Specimen Examinations 55

No. 6. Poultry-flock Approval 55

No. 7. Breeds Approved for Egg Production 55

No. 8. Turkey-flock Approval 55

No. 9. Turkey-flock Approval by Breed 56

Appendices—*Continued*

PAGE

No. 10. Poultry Vaccine Distribution 56

No. 11. Production of Grass and Legume Seeds, 1960–61 56

No. 12. Feed-grain Movements under Freight Assistance 57

No. 13. Tree-fruit Production, 1960, and Estimate for 1961 57

No. 14. Small-fruits Acreages, 1960 57

No. 15. Production of Small Fruits, Grapes, and Filberts for 1960 and Estimate for 1961 58

No. 16. Vegetable Acreage and Production, 1961 Estimate 58

No. 17. Tree-fruit Nursery-stock Production, 1958–61 59

No. 18. Comparison of Apple-tree Numbers by Variety, 1958–61 59

No. 19. Production of Apple Root-stocks, 1959–61 59

No. 20. Publications Printed in 1961 60

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-sixth Annual Report of the Department of Agriculture for the year ended December 31, 1961.

The Report represents a condensed review of the activities of all branches and divisions of the Department during the year. Detailed data are on file and available for reference.

The year 1961 can be considered a satisfactory one for agriculture, in which farm cash income reached a record level of more than $130,000,000, reflecting sustained production and generally firm market demand for farm products.

While the industry has continued to demonstrate its stability to a degree that is encouraging, it is not without a number of problems of a serious nature. Among these is the matter of land and operating costs, which continue at a high level and threaten to rise further as urban expansion exerts increasing pressure on land use in the Province.

In the dairy industry the steady increase in the production of fluid milk continues to outstrip consumption, in turn exerting strong downward pressure on unit returns. A parallel situation has developed in the tree-fruits industry, in which mounting distribution costs and increasing production in competing areas pose a threat to the sales potential in a number of the major market outlets for fruit.

At the secondary level, the closing-down of one of the major meat-packing operations in Vancouver reflected the changed economics in that industry, which now tends to favour imports of dressed meats over local slaughtering.

Notwithstanding these and related problems, British Columbia's agriculture can still be said to be progressing on a relatively sound basis. The continued increase in the Province's population, coupled with a rising personal income, offers encouraging prospects for future progress at the farm level.

This year the Department continued its programme of extension activities with farmers and farm groups, with emphasis on field-days and refresher courses. Complementing this has been an increased use of field trials and research projects in co-operation with other agencies, including the Canada Department of Agriculture and the University of British Columbia.

The Horticultural Branch conducted a successful demonstration showing the value of certified strawberry plants during the year, and launched a sprayer improvement programme in the Okanagan and Kootenay Valleys. Also introduced was a new system of certification of tree-fruit nursery stock.

In the related fields of plant pathology and entomology, problems of bacterial ring-rot in potatoes and forest tent caterpillar in Fraser Valley trees respectively received attention.

Demonstrations of the value of honeybees as pollinators to increase crop yields of alsike clover and blueberries were most successful this year. Yields of the former were increased by 60 per cent above the average, according to reports of the Apiary Branch.

The Live Stock Branch reported continued progress in the blood testing of cattle in the region extending from the North Thompson Valley southward to the

International Boundary. With the establishment of the East Kootenay and Fraser Valley Brucellosis-control Areas as certified brucellosis-free areas during the year brought to seven the number of such areas in the Province. A total of over 65,000 calfhood vaccinations was also carried out.

Twenty-six students enrolled in the revised Dairy Short Course conducted by the Dairy Branch this year, and there were nine applicants for the Babcock Tester's Licence Course. The Branch reported a total of over 77,000 resazurin tests on milk for the year, with a 3.6-per-cent failure rate.

Twenty afternoon and evening classes for producers in the main poultry-raising areas were organized by the Poultry Branch in 1961. The Branch also reported results on one laying and two broiler tests, involving 13,000 birds at the Random Sample Testing Station at Abbotsford.

The Field Crops Branch continued its programme of demonstration work on fertilizers and herbicides, as well as cereal and forage crops. A total of 3,600 soil and 212 forage samples was analysed by the Branch's laboratory in Victoria.

The survey of the soil types in Sumas and Chilliwhack Municipalities and adjacent unorganized territory was completed by the Soil Survey Branch, involving close to 83,000 acres of land. The report of the survey on the Upper Columbia River valley was published, and a survey of the Thompson River valley commenced this year.

The Agricultural Development and Extension Branch reported an increased use of specialist services and short courses as a part of a programme aimed at broader coverage of the main aspects of agriculture. The Engineering Division of the Branch provided four tractor-maintenance courses and several field-days devoted to sprayer demonstrations and farm drainage systems. Topographic surveys were carried out and plans prepared for thirty-six farms, involving some 1,800 acres of land.

A total of 7,500 acres was cleared and over 4,000 acres broken under terms of the *Farmers' Land-clearing Assistance Act* in 1961. This brought the cumulative totals of cleared and broken land since 1946 to 100,000 and 40,000 acres respectively.

The 4-H Club Division was enlarged this year with the addition of a graduate home economist. This provided for additional assistance to rural families in domestic science. The Division reported a record enrolment of over 3,000 members in 263 clubs throughout the Province, indicating a renewed interest in this field.

The Dyking Commissioner and the manager of the Southern Okanagan Lands Project both reported normal operations and maintenance for 1961, while the Land Settlement Board recorded sales in the amount of $69,282.40.

LEGISLATION

This year minor amendments were made to the *Beef Grading Act, Dyking Assessments Adjustment Act, Farmers' and Women's Institutes Act,* and the *Meat Inspection Act.*

APPOINTMENTS

C. C. Cunningham, B.S.A., D.V.M., V.S., Veterinary Inspector, January 1st.
M. G. Driehuyzen, B.S.A., Soil Surveyor, May 5th.
Miss L. R. Michael, B.Sc. (H.Ec.), Home Economist, June 16th.
K. G. Savage, B.Sc., M.Sc., Dairy Commissioner, August 1st.
G. G. Runka, B.S.A., Soil Surveyor, September 1st.
Mrs. A. B. Mah, B.Sc., Bacteriologist, November 27th.

SUPERANNUATION

G. Patchett, Dairy Commissioner, July 31st.

PUBLICATIONS

Appendix No. 20 contains a listing of publications issued in 1961.

MARKETS AND STATISTICS BRANCH

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

SYNOPSIS

Favourable growing conditions combined with steady market demand resulted in a generally satisfactory year in all major segments of British Columbia agriculture in 1961. With the exception of fruits, production equalled or exceeded the levels of the preceding year.

The index of farm prices (1935–39=100) held a firmer tone throughout the year, averaging 275.6, as compared with 271.6 in 1960. Higher returns for live stock and eggs were the chief contributing factors to this index gain.

Preliminary estimates place the total cash income from the sale of farm products at approximately $134,352,000, a rise of 5½ per cent over the 1960 total, and a record high for the industry in this Province. Farm net income also set a record of $59,671,000, an increase of nearly $3,500,000 over the 1960 figure.

FEEDS

Live-stock and poultry feeds registered price gains during the year, reflecting increased demand and decreased supplies. Feed-wheat, barley, and all-mash laying ration rose by $7 per ton by late summer, while oats and dairy mash increased by $6 and $5 respectively.

Ample stocks of hay and fodder kept prices of these basic items unchanged from 1960 averages.

LIVE STOCK

An unexpected strengthening of the market for beef cattle highlighted the live-stock market picture in 1961. Fed cattle averaged $21 through the early months, dipped slightly by midsummer, then closed out the year at around $22. Heavy calves reached a top of $24.50; lighter weights, $27.

Cattle export shipments to the United States rose sharply to a total of 21,158 head for the year, a gain of 47 per cent over the 1960 figure.

The general market trend toward younger cattle was again evident this year, as more British Columbia beef-growers converted their operations to a cow-calf basis. As a result, the numbers of beef cows and heifers in the Province increased by nearly 5 per cent during the year.

Hog prices registered a moderate decline in the latter half of 1961, dropping about $2 per hundredweight below comparable 1960 averages. Affecting total returns was the discontinuance in October of the premium on Grade B_1 hogs.

Sheep and lamb prices also declined slightly this year, averaging about $1 below 1960 quotations by December. The sheep and lamb population also dripped to a Provincial total of only 55,000 head by late autumn.

POULTRY AND EGGS

Commercial egg production increased by nearly 4 per cent this year at an average weighted producer price of 32.1 cents per dozen, a gain of slightly less than 1 cent. Although eggs placed in registered hatcheries for laying purposes showed an increase of 5 per cent, domestic supplies of eggs during the latter months of the year were insufficient to meet market demand.

Once again production of poultry meat recorded an increase, rising to a record total of over 40,000,000 pounds. The bulk of this increase was contributed by a further sharp rise in broiler production, amounting to more than 13,000,000 pounds for the year.

For the first time in recent years the production of broilers outstripped immediate market capacity, driving producer prices down to 16½ cents per pound. Production cutbacks and a continued firm demand brought prices up by 1½ cents late in the year.

Sharp increases in turkey production depressed producer prices to 28 cents per pound for popular weights, a decline of 7 cents from the 1960 level.

DAIRY PRODUCTS

The dairy industry in 1961 continued its established trend toward annual production gains. Output of fluid milk increased by 5 per cent to a total for the year of 918,000,000 pounds.

As a result of the failure of fluid-milk consumption to keep pace with this rate of increased production, output of dairy products also showed marked gains, with Cheddar cheese up 27 per cent, butter 20 per cent, ice-cream 8 per cent, and cottage cheese 5 per cent.

While the average farm value for all milk produced in the Province declined to an estimated $4.30 per hundredweight, total returns for the dairy industry for the year increased to approximately $38,000,000.

Dairy-cow numbers showed a moderate increase of 2,000 over the 1960 population, bringing the Provincial total to 96,000 head.

FRUIT

Total production of all fruits was down 16 per cent at 156,000 tons this year. In tree fruits, only cherries recorded an increase, while grapes and blueberries were the only small fruits to reverse the general trend. The Okanagan cherry-crop totalled 376,652 packages, the largest in twelve years.

The 1961 apple-crop was down 20 per cent from the preceding year at 100,000 tons. Higher prices tended to offset this decline however, bringing total returns well up to 1960 levels. Shipments of over 700,000 boxes to the United Kingdom brought returns significantly higher than the average established in recent years.

For the first time, 42 tons of fresh cherries, 300 tons of apricots, and a carlot of peaches were shipped to the United Kingdom market this year. Results from the first two of these items were encouraging.

Production of grapes doubled the 1960 total this year as recent plantings came into bearing. Further increases appear likely in the near future.

Prices for all fruits were equal to, or higher than, those realized in 1960.

VEGETABLES

Substantial increases in the output of beans, corn, and peas combined to bring 1961 vegetable production to 74,000 tons, a gain of 19 per cent over the previous year's total. This was achieved on virtually the same total acreage as that seeded in 1960. Decreased yields were registered by carrots, onions, and field tomatoes.

Prices for all major vegetable-crops were generally firm throughout, averaging slightly higher than those realized in 1960.

FIELD CROPS

Although seeded acreage in potatoes was up this year, lower yields resulted in a total crop no greater than the 105,000 tons lifted in 1960. Prices were down, but sharp declines were avoided through the Federal Government's action in placing a fair value for duty on United States imports in July.

In contrast to the major grain-growing areas of the country, British Columbia harvested an excellent crop in 1961. A total of 8,115,000 bushels of cereal grains was taken off, of which 4,300,000 bushels were oats.

Prices were firm and grades were above average, producing significant increases over all. Wheat, for example, found a ready cash sale for feeding purposes at prices as high as $1.35 per bushel.

Production of forage-crop seed was down 20 per cent this year, due primarily to sharp declines in creeping red fescue and alsike clover. Prices generally remained at the depressed levels established in 1960.

MISCELLANEOUS

The 1961 honey-crop reached a new all-time record for the second successive year as a total of 2,080,000 pounds was extracted from 21,514 colonies. Prices remained unchanged at 21 cents per pound wholesale.

Wool production increased to 391,000 pounds as 50,200 sheep yielded an average fleece weight of 7.8 pounds.

LEGISLATION

Two schemes pursuant to the *Natural Products Marketing (British Columbia) Act* were passed by Order in Council during the year. The first, the British Columbia Egg Marketing Scheme, was voted on in a plebiscite among all poultrymen having 500 or more laying birds, and was defeated by a 2 to 1 majority.

The second, the British Columbia Broiler Marketing Scheme, 1961, was similarly voted on, and received the endorsation of 84 per cent of the eligible producers. A three-man marketing board was subsequently elected to control the marketing of broiler chickens produced in the Province.

Further revisions to the regulation pursuant to the *Fruit, Vegetables, and Honey Grades Act* were also drawn up and published.

ADVERTISING

A new policy of dollar-matching grants in aid of promotional advertising of British Columbia farm products was introduced this year, with encouraging results. Products featured included Cheddar cheese, potatoes, tree fruits, and loganberries.

HORTICULTURAL BRANCH

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

The Horticultural Branch continued its intensive programme of service to the farmers throughout horticultural areas of Southern British Columbia. In addition, specialist service was provided to Central British Columbia and the Peace River District. Farm contacts were reinforced by the use of demonstration plots, mass media, and group meetings.

Some of the programme highlights include the successful demonstration of the value of certified strawberries, the institution of a sprayer improvement programme in the Okanagan Valley and Creston, the introduction of a scheme to certify tree-fruit nursery stock, and general improvement in the production of greenhouse crops.

Reports on horticultural-crop development, by means of the Horticultural Newsletter, have been streamlined by issuing a brief weekly summary of crop development and a regular schedule of crop estimates.

TREE FRUITS

The 1961 tree-fruit crop was light, with notable deficiencies in Bartlett pears, McIntosh apples, and prunes. Orchard labour was in good supply. A cool spring followed by a warm summer favoured the development of codling moth, mites, apple scab, and mildew. *See* Appendix No. 13 for production figures.

The cool spring weather reduced the fruit-set in all crops, with the exception of cherries, in which production reached the highest level since 1949–50. However, the warm summer provided excellent growing conditions, resulting in generally good sizing and quality. This was particularly evident in Bartlett pears, in which improved size and quality helped offset the lightest crop in a decade. There was also less " pear decline " than has been evident in recent years.

Similarly, the warm summer brought most of the peach-crop to maturity in August, so that the inferior quality usually associated with September harvesting was avoided.

Fruit size was variable and colour was slow in developing in the apple-crop as a result of the prolonged warm weather. This was particularly evident in the McIntosh variety. Newtowns were generally small and Winesaps medium to small in size.

The change to bulk handling of tree fruits continues in packing-houses throughout the Okanagan. Grading equipment and handling facilities are showing marked improvements.

SPRAYER TESTING

Short courses have been given to Interior horticulturists so that they will be fully aware of the requirements of an efficient spray machine. Air-speed indicators were supplied to each office during the past year to assist in this programme. In almost every instance where the service was requested, improvements were possible in the machine. This programme will be continued in the coming season.

BIRD DAMAGE

Damage was reported from evening and pine grosbeaks, which destroyed fruit buds in the spring. Starlings were noticeably present in the early autumn. Orchardists made extensive use of scare guns, and the industry paid a bounty on birds shot. Many built traps, using the plans distributed by this Branch.

SMALL FRUITS

A small-fruit survey was carried out in the Province during the winter of 1960 and early spring of 1961 to determine the acreage and varieties grown throughout the major small-fruit areas of the Province. (*See* Appendix No. 14.)

The highlight of the survey is the increase in blueberry acreage from 553 to 858 acres between 1957 and 1960. Cranberries have also increased by a third during the same period to a record high of 148 acres in 1960. Strawberry acreage declined in all areas of the Province. However, spring plantings of an estimated 450 acres will restore the Lower Mainland industry to its former position. A slight increase in loganberry acreage was noted on Vancouver Island, the main area of production for this crop.

Blueberries.—The market demand for fresh and processing blueberries is brisk. Growers are expanding their acreages, and many new growers are interested in this crop. By the end of next year it is estimated that there will be well over 1,000 acres planted. A decade ago the production was less than 20,000 pounds; this year it was 1,882,000 pounds. Co-operation has been given in a variety testing programme for processing, through the Research Station at Summerland.

Cranberries.—The production of cranberries increased by over 100 per cent in the past year. This was possible through new acreage and improved knowledge of the crop. The trend is to larger crops in the future.

Loganberries.—The crop was 10 per cent heavier than last year, and an even larger crop would have been harvested if the extremely hot weather in July had not damaged some of the fruit. The wine industry continues to take a large portion of the production.

Strawberries.—There is a trend toward larger units of production in strawberries, with several plantings in excess of 25 acres now in operation. It is also noted that there is a reduction in the number of holdings in the 2- to 5-acre category. Growers are optimistic about the future of strawberries, provided labour is available to harvest the crop. The highlight of the year has been the unqualified grower acceptance of the virus-free plants originating from the strawberry certification programme. One 10-acre block produced over 9 tons of berries to the acre using certified British Sovereign plants.

Raspberries.—The processing industry is anxious to obtain more raspberries, and it is probable that there will be an increase in acreage of this crop. Many plantings of the Newburgh variety are now more than 10 years old and due for replacement. Certified plants of this variety will be available in 1963 through the co-operative programme with the Department and the Experimental Farm at Agassiz. The Sumner variety is proving satisfactory, and plants of this variety will also be available through the above programme.

Grapes. — The 1961 grape-crop in the Okanagan amounted to 2,827,656 pounds, equal to the previous record high set in 1944. Sixty per cent of the crop was sent to wineries. Variety and testing of grapes continues in the Okanagan, with emphasis laid on the French hybrids. Your Provincial Horticulturist arranged for grape varieties to be tested at the Vineland Experiment Farm, to determine whether there is a significant difference between varieties grown in the Niagara area of Ontario and in the Okanagan Valley as far as the wine industry is concerned. An outbreak of grape phylloxera on two plantings of vines imported from Ontario this year has been dealt with by means of an eradication and control programme. District offices checked plantings of French hybrids in their areas for this pest.

VEGETABLE PRODUCTION

Coastal Region

The wet, cold soils delayed the planting of many vegetable crops until April. By July the weather had turned unusually hot, and where irrigation was available, excellent crops were produced.

Moderate increases were made in processing crop acreages of peas, corn, pole beans, bush beans, broccoli, cauliflower, and potatoes. (*See* Appendix No. 16.)

Onions.—Considerable interest is developing in the production of onions in the Fraser Valley. This crop requires special care in harvesting and storage, especially on muck soils. Progress in this field has been made in a co-operative project with the University of British Columbia Farm Engineering Department.

Carrots.—The fresh market demands long carrots. Growers have had difficulty in handling this crop, but now mechanical harvesters have been introduced which are satisfactory. They will dig and top up to 60 tons per day. Bulk handling of carrots for processing is another relatively new programme.

Beans.—The Fraser Valley crop of beans was excellent where moisture was available. Pole beans are no longer as popular as they were because of the labour problems. There is a marked trend toward the production of bush beans, which can be mechanically harvested. The situation is similar for the limited acreage in the Okanagan Valley.

Mushroom Production.—The 1961 crop of mushrooms was estimated to be 1,776,000 pounds, which will return about $800,000 to the producers. The industry is considering various marketing programmes it might use if production increases significantly.

Interior Region

Crops developed well in the Interior with a warm spring and hot summer, and the harvest was completed under ideal conditions. Potatoes, onions, sweet corn, and turnips increased in acreage, while tomatoes, asparagus, and beans registered a decline.

There has been a steady decline in tomato acreage over the past fifteen years. Considerable effort has been put into programmes to increase tomato production by industry and Government agencies. Reports in previous years have carried an outline of the work done. Increasing attention is being paid to the fresh market for tomatoes. It is possible to double the present acreage if available markets are to be supplied.

Vegetable Varieties.—Tests have been carried out with field and greenhouse tomatoes, sweet corn, cucumbers, and a number of other crops.

Turnip Processing.—In co-operation with the Research Station at Summerland, tests are being carried out with turnips as a base for candied peel, as a frozen diced vegetable, as a preserved prepared vegetable for restaurant trade, as deep-fried slices, and as a canned product. Limited commercial trials are under way at the present time, and if they are successful the turnip industry may expand considerably.

GREENHOUSE CROPS

For the second consecutive year, the market for greenhouse vegetable-crops improved. The situation with flower-crops is quite healthy, with no serious overproduction and generally satisfactory prices. There is a steady growth of the industry, especially in the Fraser Valley.

Greenhouse tomatoes suffered from poor lignt conditions last spring. Physiological conditions, such as blotchy ripening and tissue breakdown, occurred. Cucumbers continue to be popular, especially the Long English variety. The production and return from chrysanthemums, roses, stocks, and snapdragons has been satisfactory, and there has been an increase in the production of specialty flowers such as orchids.

Commercial sources indicate that 2,500,000 square feet of Mylar plastic has been sold in British Columbia this year. Mylar houses are suitable for plants which tolerate high humidity and are superior to glass houses for crops such as foliage plants. Glass houses continue to be most suitable for roses, carnations, chrysanthemums, and tomatoes.

NURSERIES

Production of nursery stock is increasing in British Columbia. There are a number of factors which will likely continue this upward trend, such as the revaluation of the Dutch guilder, increasing ocean freight rates, and an increase in price for stock in Holland. In addition, some stock is imported from Japan, but only bare-rooted material. There is no prospect of any great increase from this source. (*See* Appendix No. 17 for tree-fruit nursery stock production and Appendix No. 18 for apple varieties.)

Apple Root-stocks.—A large proportion of the trees grown for local planting have been on East Malling II, and this situation continues. The only Malling Merton stock being used in quantity is MM 104. There is interest in EM 26 as a dwarfing stock, but it is not available in commercial quantities. The varieties McIntosh, Canada Baldwin, Antonovka, and Haralson are grown for hardy frameworks. (*See* Appendix No. 19.)

Colour Coding and Certification of Nursery Stock.—There have been losses to growers from incorrectly named nursery stock and a potential danger of spreading viruses from infected bud and root sources. Consequently a programme was instituted to provide healthy nursery stock which is true to name. Meetings were held during the year with officials of the Canada Department of Agriculture, the nurserymen, and the fruit-growing industry to initiate this programme.

Prior to the fall inspection, colour marking of trees was carried out as a test run on apples in anticipation of a much extended programme in the near future.

Inspections.—During the year, nurseries were inspected for incorrectly named fruit-trees, and 1,219 mixtures were found out of a total of 340,246. All tree-fruit stocks were inspected in the fall at digging-time. In addition, spot checks were made for the presence of nematodes in nursery stock in co-operation with the Saanichton Experimental Farm.

DEMONSTRATION WORK

District offices of the Horticultural Branch have given group demonstrations of horticultural practices such as pruning, grafting, and budding during the year.

Pear Sizing.—Four years of study have been put into a project to determine the growth rate of Bartlett pears in an attempt to predict the size of the fruit at harvest-time. This project will be given extensive trials during the coming year.

Factors Influencing Fruit-set.—The effectiveness of using bouquets of pollenizing blooms in setting a crop of Red Delicious was tested, and it was found that the bouquets had little effect, even as close as 2 feet from adjacent Delicious blossom.

Fertilizer Plots. — The Kelowna office has been carrying out demonstration work with fertilizers on apples to determine the optimum amount of nitrogen

required for bearing apple-trees and the response, if any, to phosphorus and potash. Fertilizer trials have also been carried out on grapes to evaluate the quantity and type of fertilizer suitable to the area.

Spray Materials.—Testing programmes for scab-control continue to be an important project in the Kootenay area. Cherry fruit fly is also under study.

Potato Variety Trials.—Various new introductions have been grown in the area served by the Vernon office.

Lettuce and Celery Nutrition.—An application of minor elements, including iron, zinc, copper, manganese, magnesium, boron, and molybdenum, was made on lettuce and celery crops in the Fraser Valley. There appeared to be a slight response from boron.

Blueberry and Cranberry Fertilizers.—A trial on various fertilizers in plantings has been under way since 1957 in the muck soils. It has been observed that nitrogen is necessary in small amounts; phosphorus and potash are required in greater amounts than nitrogen.

Greenhouse Tomatoes.—The programme of greenhouse improvement is gaining momentum on Vancouver Island. Demonstrations of soil fumigation, soil improvement with organic matter, and plant management have resulted in a general improvement in yield of tomatoes in many houses.

Chemical Weed-control.—Horticulturists in all areas are carrying on limited trials of chemical weed-control in various horticultural crops. The most extensive programmes are being carried out at Abbotsford and Vernon.

NEMATODES

It is becoming increasingly apparent that heavy populations of parasitic nematodes can prevent horticultural crops being produced, especially in the Coastal areas. Any new programme in control of this pest is given consideration. One tried last year included the planting of various marigold species to determine the effect in depressing known heavy populations of nematodes. Some success has been indicated, and further study will be given to this practical programme.

Through the co-operation of Mr. J. E. Bosher, of the Experimental Farm at Saanichton, a series of tests was run to help evaluate the nematode problem. Samples from the Fraser Valley were checked, representing 139 sites last year. The following table gives an indication of the seriousness of nematode populations:—

Zero	20	Medium	13
Trace	55	High	36
Low	15		

This could be the answer to the problem of poor plant growth in old strawberry land which, up to the last few years, has remained unknown.

SPRAY CHARTS

Spray charts for vegetables, small fruits, and tree fruit in the Interior have been revised in 1961. Each of these publications will appear in book form for 1962.

LITTLE CHERRY CONTROL REGULATIONS

District Horticulturists throughout the Okanagan Valley have co-operated in a voluntary programme of flowering-cherry removal. This programme has been carried out to give protection to the sweet-cherry industry. Cherry stocks brought

into the Okanagan moved under permit through the co-operation of the Plant Protection Division of the Canada Department of Agriculture.

CODLING MOTH CONTROL REGULATIONS

Codling moth control areas have been formed under the *Plant Protection Act* in Creston, Keremeos-Cawston, Naramata, and South and East Kelowna. Applications for consideration have been received from Kaleden and Winfield-Okanagan Centre.

EXTENSION METHODS

Short Courses.—Grower short courses were held on Vancouver Island and the Fraser Valley during the winter months, with emphasis on small-fruit and vegetable production. In the Interior the annual tree-fruit Chautauqua meetings were again held in ten centres, with twenty meetings in all.

Field-days were held during the summer for the small-fruit, tree-fruit, and grape industries and various phases of the vegetable industry. In addition, horticulturists participated in field-days held by greenhouse operators and bulb, nut, holly, and other growers.

Speakers were provided for numerous meetings throughout the Province.

Radio has been widely used, together with newspapers, as extension media. In addition, television was used, especially in the Okanagan, where a weekly half-hour programme was provided. This service, broadcast by CHBC-TV to Interior farmers, is produced by your horticulturists, and they participate in the programmes frequently.

PLANT PATHOLOGY BRANCH

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

DISEASES

Field Crops and Vegetables

Bacterial Wilt of Alfalfa.—This was found on 38 per cent of the farms of the Interior in 1961, compared with 78 per cent in 1956. The resistant variety Vernal is gradually replacing the susceptible Grimm.

Onion smut showed an increase at Kelowna. Formaldehyde and anticarrie 80 per cent hexachlorobenzene seem to be the only effective treatments.

Bacterial ring-rot of potatoes resulted in twenty-seven farms in the Fraser Valley being placed under detention. Twenty-four had from trace to slight amounts of disease and three had from 6 to 15 per cent. Twenty-two of the outbreaks occurred in the Kennebec variety. The main source of infection appeared to be certified seed from Prince Edward Island and the United States.

Leaf-roll of Potatoes.—The incidence of primary leaf-roll net necrosis in the Netted Gem variety appeared to be slight both at the Coast and the Okanagan.

Tree Fruits

Powdery mildew of apple was widespread in the Okanagan, where it caused some russetting on the fruit.

Apple Scab.—Wet weather in the spring and early summer until the middle of July was favourable for infection. The dry weather of August and September was unfavourable for the development of pin-point scab. The most effective fungicides for control were Dodine and Dichlone. When these were applied at low temperature, they sometimes produced a russetting. The risk of russetting seems to increase with the effectiveness of the fungicide against scab.

Little cherry has not been found west of the Arrow Lakes. The little cherry indicator variety Sam, planted at a number of locations between Vernon and Nakusp in 1959, showed no evidence of the disease when examined in August. Japanese flowering cherry-trees, symptomless carriers of this disease, have been romoved from the Okanagan.

Fire-blight of Pears.—Severe infections of the fruit occurred where pears were damaged by hail in the Okanagan.

Trellis Rust of Pears.—Eradication of trellis rust of pears, caused by the fungus *Gymnosporangium fuscum,* was started as a result of (1) the discovery of this rust for the first time in North America by Dr. W. G. Ziller, Forestry Biology, Canada Department of Forestry, at Victoria on February 15th, and (2) the placing of a two-year post-entry embargo on pear and juniper nursery stock by the United States Government. The eradication on the junipers took place in April and on the pears in August, as follows: (*a*) Junipers, 32 removed and 34 pruned; (*b*) pears, 20 removed, 16 heavily pruned, 11 slightly pruned, and affected leaves removed from 177 trees.

Small Fruits

Cane-gall of blueberry is widespread in the following susceptible varieties: Cabot, Dixi, Weymouth, Stanley, Charlotte, and Burlington.

Godronia canker of blueberry is widespread in the Fraser Valley. The older varieties Grover, Pioneer, Rancocas, and Rubel, which have been grown for over thirty years, appear to be more resistant than the more recent varieties.

Raspberry leaf-curl is widespread in the Creston Valley. Growers have been advised to rogue early, often, and thoroughly. A spray programme has also been recommended in an attempt to control the vector.

Ornamentals

Root-rot of Lawson's cypress continues to cause considerable damage at the Coast.

Bacterial blight of forsythia was observed in a number of gardens on Vancouver Island for the first time.

Bacterial blight of lilacs was widespread throughout the Province.

ENTOMOLOGY BRANCH

C. L. Neilson, M.S., Provincial Entomologist

The year 1961 did not produce any major economic insect outbreaks. However, damage to trees by forest tent caterpillar was particularly heavy in the Fraser Valley. Codling moth infestations were higher and resistance to hydrocarbon insecticides by carrot rust fly was established.

FIELD-CROP AND VEGETABLE INSECTS

Grasshopper populations remained low. Red-backed cutworms were a minor problem in Interior vegetable areas. Green peach aphid infestations on potatoes were the lowest in the past three years. Demonstrations of aphid-control on potatoes were conducted at Lavington and Grand Forks, but were not conclusive, due to low aphid populations. English grain aphid and pea aphid populations were low in the Fraser Valley, but the cabbage aphid was more prevalent than it has been for the past two years. There were cases of resistance to hydrocarbon insecticides by cabbage and turnip maggot and also carrot rust fly in the Fraser Valley. A combined experiment in turnip maggot control was carried out with the Canada Department of Agriculture (Vancouver) at Prince George and Armstrong. An attempt to control onion maggot by the " dip " method for onion transplants was made at Kelowna. The imported cabbage worm was abundant throughout the Interior and Fraser Valley. Corn earworm was troublesome for the second year, particularly in the Fraser River delta area.

The pollination demonstration by honeybees on alsike clover was carried on for the second year at Mile 24, Alaska Highway. Seed yield was increased approximately 150 pounds per acre over the district average of 250 pounds per acre. Early season dusting of alsike with one-half pound of actual DDT per acre for plant bug control also gave a 75-pounds-per-acre increase in seed yield over non-treated areas.

The joint project into reasons for seed-head blasting of merion blue and fescue grasses in the Peace River area continued with the Canada Department of Agriculture (Kamloops). Wheat midge was again a problem in the Kersley area. Miscellaneous inquiries covered a wide range of both field-crop and vegetable insects.

ORCHARD INSECTS

Codling moth caused more injury than in 1960, especially by first-brood larvæ, due to very favourable egg-lay weather. Rust mites were more injurious than in 1960, but blister mite damage was the lowest in several years. European red mite damage to pome fruit was less than in 1960, but higher in many peach-orchards. McDaniel spider mite was the worst orchard pest in 1961. Dieldrin failed to control pear psylla in many orchards, due to resistance. Apple and cherry aphid infestations were generally lower than in 1960. European earwigs proved particularly troublesome to peach and apricot orchards, with some reports of damage to apples near harvest. Eye-spotted bud moth and fruit-tree leaf roller populations were low, as were most scale insects, peach-tree borer, and woolly apple aphids. The shot-hole borer was troublesome in the Oliver-Osoyoos areas, with reports of damage to healthy trees. The peach twig borer caused economic losses for the first time in several years.

A demonstration of the use of honeybees and pollen inserts was conducted jointly with the Provincial Apiarist at Oyama.

SMALL-FRUIT INSECTS

Grape phylloxera was found for the first time in British Columbia in the Okanagan. Infected plantings were pruned, dug out, and treated then heeled in for 1962 replanting. Soil will be fumigated prior to replanting of the acreages concerned. The grape erineum mite was also found for the first time in British Columbia at Penticton. The clay-coloured weevil was observed damaging buds of raspberry in the early spring in the Abbotsford area. The black vine and straw-

berry root weevils were troublesome as usual on untreated soil. The weevil *Sciopithes obscurus* caused serious damage to plants on some treated soils in the Saanich district. Cyclamen mite caused serious damage to Northwest and Siletz strawberries on a 10-acre planting at Abbotsford. Blackheaded fireworm was numerous on untreated cranberry bogs. Leafhoppers were abundant on cane fruits in the Fraser Valley, and forest tent caterpillar was troublesome on blueberries.

LIVE-STOCK INSECTS

Warble fly work continued as a major research project of the Canada Department of Agriculture Laboratory, Kamloops, with the main emphasis on control through the use of systemic insecticides. The Empire Valley joint warble-control project continued for the fourth consecutive year, with Ruelene pour-on method being used for the first time. Warble-control demonstrations with Ruelene pour-on method were made at Rock Creek (two); Okanagan Falls (two); Lac la Hache, Quick, Barnston Island (five); Courtenay (two); and Duncan (three).

Paralysis ticks were present somewhat earlier than usual in the North Thompson Valley than previously recorded, but few cases of cattle paralysis were reported. Cattle lice continued to be of concern, and live-stock men are hopeful that the new warble fly treatment will control lice as well. Good sheep ked control was reported on a large flock which was dusted with 1 per cent Dieldrin in the spring of 1961.

Mosquitoes were abundant in many areas. All control districts were visited at least once during the year in an effort to improve their control techniques. New control areas were initiated at McBride, Chu Chua, and the Windermere district. The Canada Department of Agriculture (Kamloops) instituted a research programme on mosquitoes in the Fraser Valley, which should prove very beneficial to the control programme in the years ahead.

OTHER INSECTS

Inquiries for identification and (or) control measures were many and varied. There was a case of poisoning by black widow spider in Vernon, and wasps and yellow-jackets were particularly troublesome. Carpet beetles, termites, carpenter ants, powder post beetles, strawberry root weevil in homes, lawn moth, slugs, and boxelder bugs were among the most numerous inquiries. A joint experiment with Forest Biology (Vernon) to control aspen leaf miner and Douglas fir midge through the use of Rogor, applied as a trunk or foliage treatment, was conducted at Vernon. The foliage treatment was successful.

EXTENSION AND PUBLICATIONS

At least one visit was made to every district office in British Columbia, and local problems investigated as needed. Mr. Arrand addressed several beekeeper short courses and field-days. Newspaper, radio, and television articles and presentations were made on many occasions. Two technical papers were presented at the annual meeting of the Entomological Society of British Columbia. We also participated in the vegetable-growers' meetings, the tree-fruit summer field-days, and Chautauqua meetings. We took an active role in the revision of tree-fruit, small-fruit, and vegetable insect and disease control calendars. Mimeographed sheets on several insects were prepared for distribution. Two articles were prepared for publication in " Bee Wise." In addition to the above, conferences were attended on mosquitoes in California; forage, vegetable, and fruit insects at Portland, Ore.; live-stock insects at Lethbridge, Alta.; fruit pollination at Penticton; and grape phylloxera at Penticton.

APIARY BRANCH

J. CORNER, PROVINCIAL APIARIST

Honey production during the 1961 season totalled 2,080,000 pounds, the highest on record. The Peace River area realized on average of 200 pounds per colony, but elsewhere in the Interior the average per-colony production of 60 pounds was the lowest recorded for the past ten years.

BEE DISEASES

The incidence of American foul brood (*Bacillus larvæ*) was more severe this year as a very short honey-flow period in the southern half of the Province brought on intensive robbing by powerful colonies. This resulted in spread of American foul brood at a difficult time for control. Another contributing factor was the feeding by over-wintered colonies on unused reserves of stores.

A total of fifty-three cases of European foul brood was located, with outbreaks of this disease being observed in Okanagan apiaries for the first time in recent years. A total of 200 cases of American foul brood was located and burned. Sac brood, as always, was fairly widespread and more noticeable in the Thompson Valley area. Nosema disease was serious during spring months in the Lower Mainland area, but declined as warm weather developed.

Preventive feeding of terramycin (TM 25) in the spring and sodium sulphathiazole in the fall is now an established method of disease-control in British Columbia.

WINTERING

Wintering conditions were ideal during the 1960/61 winter months. Estimated winter loss from all causes was only 3 per cent.

POLLINATION

Germination tests of hand-collectied pollen were carried out in co-operation with Dr. K. Lapins, of the Summerland Research Station.

In the British Columbia Peace River area the practical demonstration of the use of honeybees on alsike clover was continued. An average of 400 pounds of cleaned seed per acre was harvested, which was 150 pounds more than the district average of 250 pounds. A total of 393 colonies was rented by growers of fruit and legume seed. Rental fee for these was $1,798, or an average of $4.58 per colony.

Field tests were carried out in Oyama on the use of mechanical beehive inserts for the distribution of hand-collected pollen. These were used to pollinate a block of Red Delicious apple-trees.

For pollinating high-bush blueberries, 121 colonies were used, as compared to ninety-two colonies during the 1960 season. An increase of berry production was noted on these farms—290 tons, as compared to the 1960 production of 213 tons on the same fields.

PUBLICATIONS

A small leaflet entitled "Clover Seed Growers—Why Gamble—Use Bees" was published. Standards of perfection for preparing, exhibiting, and judging honey were written and published. Mimeographs on the following subjects were prepared:—

(1) Fumidil B for the Control of Nosema Disease.
(2) Poisoning of Bees and Brood.

HYBRID-QUEEN REARING PROJECT

This project was continued with the co-operation of Mr. L. Fuhr, of Okanagan Landing. A small number of queens were distributed to beekeepers.

EXTENSION

Extension programmes and short courses were held in Dawson Creek, Fort St. John, Penticton, Kamloops, Victoria, and Duncan. Five television programmes and four radio broadcasts were given. Eighty-five meetings and fifteen field-days were attended. Tapes dealing with pollination and insecticide poisoning were made, and a 16-mm. film, " Disease and Pests of the Honeybee in British Columbia," is nearing completion.

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 Clinton Bull-control Area was established, bringing the total of bull-control areas within the Province to thirteen, while the establishment of the North Okanagan and Upper Cache Creek Bull Districts brought that total to sixteen. The three stallion-control areas still remain. Regulations respecting artificial insemination of cattle were approved during the year. Two artificial-insemination centres and fifty-eight technicians were licensed.

Contagious Diseases (Animals) Act

The eradication of brucellosis from the cattle population of the Province continues to exceed expectations. During the year the East Kootenay and Fraser Valley Brucellosis-control areas were declared certified brucellosis-free areas by the Health of Animals Division of the Canada Department of Agriculture. There are now seven certified brucellosis-free areas — Pemberton-Sechelt, West Kootenay, McBride, Vancouver Island, and Nicola in addition to the above two.

The blood-testing of cattle in the two Federal brucellosis-control areas—the South Okanagan and the Kamloops-North Okanagan—is progressing favourably, and no doubt both will be declared certified brucellosis-free areas some time during 1962.

The establishment of Cariboo-Central British Columbia as a brucellosis-control area brought the whole Province under the supervision of the Health of Animals Division for brucellosis eradication, except for the Peace River Block. It appears that the objective of the Department of Agriculture of having the whole Province under Federal supervision for brucellosis by 1963 will be achieved.

The two Veterinary Inspectors seconded to the Health of Animals Division to assist with the brucellosis-eradication programme in the Fraser Valley returned to duty with this Department during June.

During the twelve-month period ended June 30th there were 59,362 calfhood vaccinations carried out in the brucellosis-control and certified areas, while total vaccinations amounted to 65,450 in the same period. The cumulative totals from the time the Federal-Provincial Joint Policy on Brucellosis Control was established July 15, 1950, until June 30, 1961, now stand at 337,072 and 450,699 respectively.

Payments to veterinary practitioners for services rendered since the inception of free calfhood vaccinations on May 1, 1956, now amount to $294,448.

Veterinary Inspectors vaccinated a total of 1,115 calves on 189 premises and blood-tested 139 cattle on ten premises. Brucellosis blood-test results showed 137 head were negative and 2 head over 36 months of age were suspicious. Vibriosis of beef cattle was present in some herds, but was not as widespread as it has been in previous years.

It has become evident that range-cattle deaths reported last year as " bovine pulmonary emphysema," " Skyline disease," or " bog fever " are quite numerous in the area between Prince George and the Alberta Border. This situation is serious, and officials at the Federal Range Experimental Farm at Kamloops are conducting a research project to determine the nature of the disease complex. Considerable work on this " proliferative pneumonia " syndrome is being done on the North American Continent. Progress in solving the problem will likely be slow. In the meantime, rational and empirical treatment is recommended, depending on the symptoms of each case presented.

There was a serious genital infection in range cattle in the Princeton area during the late summer and early fall. The primary infectious agent was found to belong to the virus group causing infectious bovine rhinotracheitis-infectious pustular vulvo-vaginitis (I.B.R.-I.P.V.) and was complicated by a secondary bacterial infection. It is likely the infection was introduced to the area through the addition of an infected bull.

Pink-eye was very prevalent during the summer months in the beef cattle of the Kamloops area.

In the Smithers-Burns Lake area considerable work was carried out to determine the cause of the yearly deaths in calves and lambs during the early spring. It was known the deaths were due to white muscle disease (W.M.D.), which is primarily due to a selenium deficiency. Affected calves and lambs were injected with a selenium product which is on the market for use for the first time, and the results were very encouraging, in particular where affected calves were injected. The Department has embarked on a programme of selenium injections to the pregnant cows and ewes as a preventive measure. This will then terminate the Department's participation as cattle and sheep owners will be expected to look after white muscle disease in future years.

Trichinosis, a parasitic disease of hogs where the larvæ lodge in the muscle tissue, was a serious problem in the Clearbrook area of the Fraser Valley. Twenty-four persons were known to become infected through the eating of raw pork sausage. The problem of trichinosis in humans is Canada-wide and occurs mostly in new Canadians from Europe who have been used to eating pork products in the raw state.

Veterinary Inspectors carried out routine inspections for foot-rot on 11,645 sheep at twenty-three 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

For 1961 a total of 484 fur-farm licences was isued and $5,795 collected. The number of fur-farms is decreasing, but the number of fur-bearers on each unit is increasing. Inspectors made a total of 157 fur-farm visits.

During the year three fur-farms were quarantined because of distemper in mink and two quarantines were lifted which were carry-overs from the previous year. Three distemper quarantines remain in effect at the year-end.

Virus enteritis of mink was positively diagnosed on thirteen farms in the Fraser Valley through the Animal Pathology Laboratory. In the four years virus enteritis has been present in the Fraser Valley, thirty-two farms have had a positive diagnosis. The Fur Farm Inspector reports the infection is even more widespread as many mink-ranchers with this problem are not presenting mink to the Animal Pathology Laboratory for diagnostic purposes. There is, however, widespread use of vaccines for virus enteritis, distemper, and botulism.

Eight persons who refused to obtain their fur-farm licences were charged in Court under section 5 of the Act. All were assessed fines and costs.

Meat Inspection Act

Establishments under the 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	No
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	No
10	Delta Cold Storage, Ladner	B	No

Cambie Stock Farms Ltd. licensed January 25th; Sun Min Sang Co. licensed March 31st; Borsato Meat Ltd. licensed April 18th; Delta Cold Storage licensed April 18th.

Total carcasses inspected after slaughter and condemnations for 1961 were as follows:—

	Carcasses Marked "B.C. Passed"	Carcasses Condemned	Total	Percentage Condemned	Portions Condemned
Cattle	6,669	19	6,688	0.284	3,161
Calves	17,839	940	18,779	5.005	465
Sheep	376	4	380	1.050	30
Lambs	1,133	3	1,136	0.264	95
Swine	16,957	31	16,988	0.182	6,382
Goats	121	.....	121	.....	5

Causes of carcass condemnations were as follows:—

Cause	Cattle	Calves	Swine	Sheep
Bruises	2	120	1	4
Emaciations and mucoid	5	52	-----	3
Immaturity	-----	574	-----	-----
Imperfect bleeding	-----	22	1	-----
Mammitis	2	-----	-----	-----
Metritis	1	-----	-----	-----
Nephritis	-----	63	-----	-----
Pericarditis	-----	16	13	-----
Peritonitis	1	14	1	-----
Pneumonia and pleurisy	3	33	4	-----
Septicæmia and pyemia	4	2	2	-----
Pyrexia	-----	41	-----	-----
Jaundice	-----	-----	1	-----
Uremia	-----	-----	1	-----
Contamination	-----	-----	3	-----
Abscesses	1	-----	-----	-----
Tumour	-----	2	-----	-----
Icterus	-----	1	1	-----
Erysipelas	-----	-----	2	-----
Salmonellosis	-----	-----	1	-----
Totals	19	940	31	7

The total slaughtering done in abattoirs licensed under the *Stock Brands Act* and the Provincial *Meat Inspection Act* for the years 1957 to June 31, 1961, inclusive, is included in Appendix No. 1.

Milk Industry Act

The inspection of dairy-farms selling raw milk as approved raw-milk dairy-farms and dairy-farms shipping milk as approved fluid-milk dairy-farms is efficiently carried out by the Veterinary Inspectors and the Dairy Farm Inspectors.

The trend of more milk being produced on fewer dairy-farms continues, and the number of farm holding-tanks and pipe-line milkers installed increases at a rapid pace. Vancouver Island dairy-farmers have, in particular, commenced converting to farm holding-tanks in great numbers during the year.

Veterinary Inspectors on seventy-six dairy-farms examined 1,024 cows for clinical cases of mastitis and found 373. Of these, treatment was recommended for 363 cows and ten were eliminated as incurable.

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

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

Sheep Protection Act

Compensation paid from the Dog Tax Fund for the years 1959, 1960, and 1961 is as follows:—

Year	Goats		Sheep		Poultry	
	Number	Compensation	Number	Compensation	Number	Compensation
1959	-----	-----	242	$5,421.00	2,278	$2,768.10
1960	-----	-----	263	5,341.00	404	665.06
1961	2	$42.50	197	3,767.00	685	574.21

POLICIES

Artificial Insemination Assistance Policy

Under this policy, grants were made toward the Young Sire Evaluation Programme and the frozen-semen laboratory at the British Columbia Artificial Insemination Centre, Milner. Special grants were made to the Quesnel Artificial Insemination Association, the Nechako Valley Dairymen's Association, the Dawson Creek District Dairy Producers' Association, the Kamloops Artificial Insemination Association, the Alberni Farmers' Institute, and the Bulkley Valley Cattle Breeders' Association.

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

Dairy Cattle Placement Policy

A total of 34 head of dairy stock, including 32 head of young Holstein heifer calves, was selected by the Live Stock Inspector from Fraser Valley Dairy Herd Improvement Association herds and shipped to the Okanagan Valley, Quesnel, the Queen Charlotte Islands, and Bella Coola.

During the twelve-year period since inauguration of this programme, a total of 785 head of dairy cattle have been selected.

Thirty-six of the heifers shipped to the Okanagan Valley over the years have completed 105 records in eleven D.H.I.A. herds, with an average production of 11,370 pounds of milk, 423 pounds of fat, and a test of 3.7 per cent, almost 2,000 pounds more milk and 20 pounds more fat than the average for all D.H.I.A. records completed in 1960 in the Okanagan area. This latter was 9,448 pounds of milk and 403 pounds of fat.

The Placement Programme heifers produced 770 pounds more milk than the Provincial average of all D.H.I.A. records completed in 1960, and 73 per cent of the records completed by these animals ranged from 10,000 pounds of milk upwards.

Federal-Provincial Sheep Transportation Policy

This policy came into effect during the fall to encourage and assist farmers in purchasing within this Province or from approved Prairie points high-quality grade ewes, up to and including 5-year-olds, to provide the foundation for a sound commercial sheep-breeding programme. To be eligible under this policy, a minimum of 100 ewes must be transported a distance of over 200 miles. Four shipments qualified, and 600 grade breeding ewes were transported.

Live-stock Improvement Policy

Assistance given to defray freight costs of pure-bred animals transported into the Peace River Block covered four boars and seven rams.

Pure-bred Sires Purchase Assistance Policy

A total of twenty-three bulls was bought.

Veterinary Service District Policy

The purpose of this policy is to provide veterinary services in those areas where the scattered nature of farm settlements and (or) the long distances between stock farms or ranches have discouraged qualified veterinarians from establishing resi-

dence and practice, and where present and immediate potential live-stock population warrants such action. The four veterinary service districts were serviced by veterinarians located at Creston, Dawson Creek, Prince George, and Williams Lake. During September the three-year agreement terminated with the Creston Veterinary Service District as the veterinary practitioner was sufficiently well established, and the grant for that district was transferred to Fort St. John. So far, a veterinarian has not been located to establish practice there. A fifth veterinary service district was established at Smithers on December 15th.

General

Assisted by members of the Extension Branch, the Live Stock Division sponsored four sheep-breeder field-days at Duncan, Abbotsford, Fort Fraser, and Westwold, as well as a Swine Breeders' Short Course at Abbotsford.

In dairy-cattle feeding and management, lectures were presented at Abbotsford, Alberni, Aldergrove, Coombs, Courtenay, Kelowna, Little Fort, Metchosin, Salmon Arm, and Vernon.

Staff members have participated in the activities of the Beef Cattle Advisory Committee and the Sheep Steering Committee.

Practically all staff members, to some degree, have participated in the civil defence activities, which are becoming more evident as a part of our duties in this Department. Two Veterinary Inspectors attended separate veterinary indoctrination courses at the Civil Defence College at Arnprior, Ont., and the Live Stock Inspector attended an ogrologists' indoctrination course held in Victoria.

BRANDS DIVISION

(Thomas Moore)

Inspection Service

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

Brand Inspections

A total of 126,351 head of cattle was inspected, an increase of 10,691 from 1960. Horses inspected numbered 7,648, an increase of 1,118. There were 15,193 hides inspected, an increase from 1960 of 1,204. Kamloops-Nicola area had 50,193 cattle inspected, an increase of 2,897 head. Cariboo cattle inspection totalled 23,860, an increase of 3,074. (*See* Appendix No. 3.)

Exports to United States

Total cattle exported numbered 21,158, of which 20,931 head moved from the Interior points. This is 6,597 more than in 1960, and comprised 299 bulls, 1,889 cows, 11,999 steers, 2,743 heifers, and 4,302 calves.

Flood and Fernie 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 were as follows:—

	1960	1961
Flood—		
Cattle	12,175	13,480
Horses	2,417	1,897
Hides	3,376	6,908
Dressed beef (quarters)	678	665
Number of trucks checked	1,617	1,979
Fernie—		
Cattle	10,777	14,747
Horses	311	144
Hides	245	1,048
Number of trucks checked	540	687

Brand-book

The B.C. Horse and Cattle Brands, 1960, which is compiled once every four years, was completed during the year and the usual distribution made.

The annual supplement, No. 1, to the 1960 brand-book, showing all brands issued in 1961, will be compiled early in 1962 and will be available later in that 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.

Stock Brands Act

Twenty-two convictions were obtained under the above Act.

Criminal Code

Two convictions for the theft of cattle were obtained by the Royal Canadian Mounted Police.

DAIRY HERD IMPROVEMENT SERVICES

(J. A. Mace)

Operation and Production

As at June 30, 1961, there were 19,261 cows on test, an all-time high and an increase over June 30, 1960, of 1,573 cows.

These animals were contained in 578 herds on test in twenty-six routes, another all-time high, and an increase over 1960 of fifteen herds. The average number of cows per herd was 33.3, an increase of 1.9. The average number of cows per route is 741, an increase of thirty-four.

Completed milking periods for 1960 numbered 14,665, an increase of 179 over the previous year. They averaged 10,600 pounds of milk and 437 pounds of butter-fat. This is an increase over 1960 of 24 pounds of milk and 2 pounds of butter-fat, another all-time high.

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

From January to December, 5,700 D.O.T. ear-tags were issued, an increase of 350.

SUBSIDY

Grants to twenty-six D.H.I.A. routes amounted to $56,120, an increase of $2,595 over 1960 (full year of operation of two new routes compared with one-half year in 1960).

PUBLICATIONS

H.I.C. No. 88, the lifetime production list, is in the process of being stencilled.

Five reports were published on A.I. sires giving comparative B.C.A. figures for daughter-dam pairs and total A.I. daughters. D.H.I.A. and R.O.P. records were included in all reports.

A comparison of A.I. and non-A.I. animals was prepared involving 19,124 completed records. These included 1,261 cross-bred, 1,395 Ayrshire, 2,453 Guernsey, 11,416 Holstein, and 3,615 Jersey animals. The actual average production for all animals is as follows:—

	Number	Milk (Lb.)	Fat (Lb.)
A.I.	3,804	10,350	431
Non-A.I.	15,320	10,386	431

Breed class average with cross-breds eliminated:—

	Milk (Lb.)	Butter-fat (Lb.)
A.I.	114	116
Non-A.I.	111	111

SUMMARY

All routes except the one at Quesnel-Prince George are in a very healthy state, most of them having waiting lists of dairymen wishing to take advantage of D.H.I. service. Before any further expansion is considered, it will be necessary to make provision for additional assistance both in field and office staff.

ANIMAL PATHOLOGY LABORATORY

(Dr. J. C. Bankier)

Assistance of other laboratories has been sought from time to time to elucidate the nature of disease problems, and a great deal of valuable service has been rendered by the Federal Animal Pathology Laboratory, particularly in connection with virus infections in poultry.

The Animal Disease Research Institute, Hull, Que.; the National Salmonella Typing Centre, Ottawa; the Ontario Veterinary College, Guelph; and Connaught Medical Research Laboratories, Toronto, have been most helpful in conducting certain studies on specimen material which the Animal Pathology Laboratory is not equipped to handle.

The assistance and co-operation received from the various laboratories is gratefully acknowledged.

Numerous meetings of live-stock and poultry owners and meetings relative to Departmental work were attended. One hundred and thirty field visits were made to farms in connection with disease problems encountered in specimens submitted to the laboratory. Personal interviews with farmers or their representatives who visited the laboratory concerning disease problems numbered 967. The number of live-stock and poultry owners who received service from the laboratory on the basis of specimen submissions totalled 786. The total number of specimens examined was 8,429. (*See* Appendix No. 5.)

On the basis of various animal species from which specimen material was submitted to the laboratory for diagnosis, the following are some of the more important diseases encountered (those in italic are also communicable to man):—

Animal Species	Disease Encountered
Cattle	Johne's disease, lungworm, *listeriosis,* coli-bacillosis, *clostridiosis,* white muscle disease, *paratyphoid, mastitis.*
Sheep	Contagious ecthyma, *listeriosis,* vibrionic abortion, *pasteurellosis,* nasal tumours, entero-toxæmias.
Horse	Virus abortion.
Mink	*Tuberculosis, paratyphoid,* distemper, virus enteritis.
Chinchilla	*Listeriosis, pseudo-tuberculosis.*
Rabbit	*Pasteurellosis.*
Swine	*Paratyphoid.*
Poultry	*Tuberculosis,* fowl cholera, *Newcastle disease,* infectious bronchitis, chronic respiratory disease, entero-hepatitis, *erysipelas,* necrotic enteritis, vibrionic hepatitis, pox, *paratyphoid, aspergillosis,* crop mycosis.

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

DAIRY BRANCH

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

PRODUCTION

		1960	1961 (Estimated)
Milk (total production)	lb.	876,084,000	918,000,000
Manufactured products—			
Butter (creamery)	lb.	4,990,000	5,984,000
Cheese (Cheddar)	,,	954,000	1,216,000
Cheese (cottage)	,,	5,849,000	6,140,000
Ice-cream	gal.	4,350,000	4,718,000

UTILIZATION

	Canada (Per Cent)	British Columbia (Per Cent)
Creamery butter	40.6	13.3
Factory cheese	7.3	1.8
Concentrated milk and ice-cream	10.1	22.3
Fluid sales	31.1	54.3
Farm butter	2.1	1.1
Other purposes	9.7	7.2

MARKETING

In 1960 the total consumption of all milk products represented the use of an estimated 876 pounds of milk *per capita* per annum, with 318 pounds consumed as fluid milk and cream (0.67 of a pint per day). Consumption figures for all classes of dairy products have not kept pace with the increase in population over the past few years, and this trend continued into 1961. It is estimated that fluid milk and cream sales were up 1 per cent from 1960, which is marginally less than would be expected if *per capita* consumption had remained at 1960 levels. Con-

sumption of margarine during 1960 was 23,360,659 pounds or 14.3 pounds *per capita.*

Weighted average prices in areas of production under Milk Board control show minor price fluctuations, which are a reflection of the approximate 5-per-cent increase in milk production with a corresponding increase of only 1 per cent in fluid sales. Slightly higher prices for milk directed to manufacturing channels mitigated against greater reductions in average returns.

The Dominion Bureau of Statistics reports that in 1960 the average farm value of all sales of milk in British Columbia was $4.45 per hundredweight, compared to $3.16 for all Canada. Comparable figures for 1961 are expected to show a decrease for British Columbia and an increase for Canada.

DAIRY PLANTS

Seventy-nine creamery or dairy licences were issued in 1961. Sixty-four plants pasteurize milk, twenty-seven make ice-cream, twelve butter, two Cheddar cheese, one milk powder, one evaporated milk, and sixteen cottage cheese. Two plants ceased operations during the year.

LICENCES, CERTIFICATES, AND PERMITS

Licences

	Issued 1961
Creamery or dairy	79
Milk-testers	90
Milk-graders	66
Cream-graders	17
Special tank-milk graders	57
Oleomargarine manufacturers	4
Oleomargarine wholesalers	17

Certificates of Proficiency

	Issued 1961	Total Valid
Pasteurizer operators—		
First class	5	42
Second class	14	131
Temporary	7	----
Ice-cream makers—		
First class	----	10
Second class	----	16
Cheese-makers—		
First class	----	----
Second class	----	4
Butter-makers—		
First class	1	4
Second class	----	9

Permits

	Issued 1961
Farm holding-tanks	201
Tank-trucks	7
To reconstitute milk	2

MILK GRADING

Milk graded by the resazurin test and reported by licensed milk-graders is compared below to figures for 1959 and 1960:—

	Number of Completed Tests	Number of Samples Failing to Qualify	Per Cent Failing
1959	80,132	3,296	4.11
1960	78,097	2,792	3.56
1961	77,246	2,789	3.61

DAIRY SHORT COURSE

The revised short course started in 1959 has continued to attract good numbers of students. Twenty-six students enrolled in the 1961 course and will attend the residence portion of this course after having completed their correspondence assignments. There are nine applicants for the Babcock tester's licence course.

PERSONNEL

Mr. George Patchett was superannuated on August 1, 1961, and was succeeded in the position of Dairy Commissioner by Mr. K. G. Savage.

MISCELLANEOUS

Miss Clara Taylor, of Saanichton, British Columbia's Dairy Princess for 1961, was chosen as Canada's Dairy Princess at the Canadian National Exhibition.

SUMMARY OF DAIRY BRANCH SERVICES, 1961

Number of inspections—	
Dairy plants	745
Dairy-farms (farm holding-tanks calibration, certification, etc.)	780
Butter-fat check tests (milk and cream)	2,074
Grade checks (milk and cream)	4,321
Samples taken for ring test	446
Laboratory analyses (milk and cream)	1,193
Other tests	104
Examinations (licences and certificates)	119
Number of H.T.S.T. pasteurizers tested	9
Number of farm holding-tanks certified and (or) checked	287
Number of tank-trucks examined for permit	8
Oleomargarine checks made	23

SUMMARY

The dairy industry in British Columbia is in a reasonably healthy condition. The total farm cash value of all milk produced should exceed $40,000,000. Increased production of milk without a corresponding increase in consumption, particularly of fluid milk, necessitates a greater proportion of milk being diverted to manufactured products. This trend has been of concern to the industry, and in late 1961 production declined somewhat. Increased use of labour-saving methods on the farm, during transport to the dairy plants and in the plants themselves, continued to be exploited during 1961. Automation, improved equipment and methods throughout the industry, resulted in an improved quality of dairy product being offered to the consumer.

POULTRY BRANCH

W. H. POPE, P.AG., POULTRY COMMISSIONER

The poultry industry this year saw increases of 3 per cent in the production of commercial eggs, 25 per cent in broilers, and a substantial increase in turkeys.

Improved techniques, larger flocks, disease-resistant stock, and greater productivity have lowered production costs. The well-established trend to fewer and larger production units continues and is well illustrated by the report of Vancouver Island, which states: "In 1958 the average number of birds per farm was 1,700, while in 1961 this number had increased to 2,281." This increase of 34 per cent per flock compared with the increase of 7.6 per cent in the total poultry population indicates the extent of the change throughout the Province. Increased unit productivity is the prime economic force that is accelerating this trend.

The following table clearly shows the general downward trend of prices for poultry products that has been made possible by greater production efficiency:—

	Producer Price					1961 Price as Percentage of Five-year Average
	1957	1958	1959	1960	1961	
	¢	¢	¢	¢	¢	
Eggs	32.6	33.3	32.1	31.4	32.1	99.0
Chicken	25.6	25.0	22.2	21.4	17.9	79.9
Fowl	18.2	19.4	12.8	13.9	12.7	84.4
Turkey	31.4	33.0	24.0	31.1	26.1	89.6

COMMERCIAL EGG PRODUCTION

The sharp downward trend of the past ten years in the price of commercial eggs appears to have reached a level at which the industry is sensitive to any further price reduction. The market was in generally short supply after June this year and required imports from the Prairie Provinces and the United States. Firming prices resulted in an increase in the purchases of replacement stock.

EGG QUALITY STUDY

Initiated in 1960 and supported by the British Columbia Feed Manufacturers' Association and this Department, a study to determine the nutritional and management factors involved in the production of market eggs of high quality was continued during 1961. A report prepared jointly by this Department and the Department of Poultry Science of the University of British Columbia covering the first stage of this study was published. A second report dealing with nutritional factors is being prepared.

GENERAL

Slightly higher prices, firm markets, and active demand have contributed to increased confidence in commercial egg production. Feed-manufacturers' activity in financing new production facilities and their entry into ownership and operation of commercial egg production units have accelerated the trend toward fewer and larger farms. These newly developed large production units, which, within narrow margins, have fixed costs and where production is generally committed to a single marketing agent, will undoubtedly exert a stabilizing influence. It is already evident that the smaller producer must compensate for the possible advantages

inherent in greater volume by increased productivity and strict control of input factors. The Department's farm-management programme, which could assist these producers, has not yet been widely accepted.

BROILER PRODUCTION

Broiler production is confined to the Lower Fraser Valley and Southern Vancouver Island, with about 90 per cent of the volume coming from the Valley. During the first half of the year, new broiler buildings, completed during the fall and winter of 1960/61, came into full production and resulted in a 35-per-cent increase by mid-June. In February, a co-operative promotional campaign involving the Markets Branch of this Department, the Poultry Products Institute, and the British Columbia Poultry Industries Council was successful in removing the immediate surplus, but mounting supplies overwhelmed any lasting benefit. The year closed with a total increase of approximately 25 per cent.

TURKEY PRODUCTION

While the British Columbia turkey-producers followed the Canadian trend to greater production, their increase was much more modest than that of some of the other Provinces. Vigorous action by the British Columbia Turkey Association in co-operation with the Canadian Turkey Association has undoubtedly had an influence in preventing an almost complete price collapse.

General

The technical members of this Branch attended the meetings of those organizations directly associated with the poultry industry.

In co-operation with the Department of University Extension, twenty afternoon and evening classes were held in the various production centres. These classes, designed to bring the latest production information to the producers, were well attended.

A two-day workshop was developed, in co-operation with the University of British Columbia, for the poultry-service personnel of the Province to prepar a uniform set of recommendations to be used by all who advise on production problems.

Flock Approval

This programme continues to operated efficiently and effectively, under the direct supervision of Mr. H. C. Gasperdone, at the lowest cost to the producer of any Province. Six temporary inspectors and testers are employed on a part-time basis.

The control of pullorum disease has been complicated by heavy imports of day-old chicks and hatching-eggs from the United States, where control programmes are somewhat lacking in uniformity. The willing co-operation of officials of the Health of Animals Division in preventing continued imports of stock of questionable pullorum status has been of great value. (*See* Appendices Nos. 6 to 9, inclusive, for tabular summary of the flock approval programme.)

Farm Management

The record-keeping and analysis portion of this programme is essential for the profitable operation of those farms not large enough to support a commercial cost accounting service. Those who have participated in the programme are appreciative of the operating efficiencies that it has made possible. Six producers on Vancouver Island and two in the Fraser Valley are presently participating in the programme.

Random Sample Test

Two broiler tests and one laying test involving 13,000 birds were completed during 1961. Appropriate reports have been published and distributed to all Canadian and many United States centres. Further supplies are available from the Poultry Commissioner's office.

A marked increase in the incidence of the various forms of leucosis has been encountered.

It is interesting to note that the results at eight weeks in the seventh broiler test, September 14 to November 7, 1961, are slightly better than those obtained at ten weeks in the first broiler test, September 15 to November 23, 1958. This marked difference is indicative of the improvements that have been made in the fields of genetics and nutrition in the past three years as measured by our testing programme.

Field Work

Over 3,400 visits have been made to producer premises during the year, in addition to those made to related phases of the industry.

The use of avian vaccines for the control of certain respiratory diseases in poultry for the past five years is summarized in Appendix No. 10. This table indicates the increased use of vaccine seems to be correlated with the decreased incidence of these diseases.

FIELD CROPS BRANCH

Norman F. Putnam, M.Sc., Field Crops Commissioner

CROP PRODUCTION

Cereals

The past season has been one of the most favourable in recent years for field-crop production throughout the Province. There was some incidence of winter killing of fall-seeded wheat in the Southern Interior, and high water in Creston caused some seepage damage, but elsewhere all cereals, including the spring-seeded varieties, came along well with timely rains to provide good growing conditions. Fall weather remained fine, allowing for ideal harvest conditions to take off high-quality grain. Movement of feed-grain from the Peace River and Creston to the Cariboo and Fraser Valley continues at an accelerated pace, and prices have advanced with the generally favourable market prospects for all grades of grain in Canada.

Hay and Pasture

The season also provided ideal conditions for putting up ample supplies of winter forage. With the severe drought on the Prairies, farmers in British Columbia harvested more forage this year with a view to possible export sale, which has not materialized. Pastures in the early season were good throughout the Province, but dry weather at the Coast during July and August restricted growth, forcing heavier feeding of hay and silage.

SEED PRODUCTION

The Peace River continues as one of our major seed-growing areas. Acreages of inspected cereals and forage declined somewhat this year. Creston Flats continues to increase production of registered seed of Selkirk wheat and Rodney oats.

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
Barley	162.00	Flax	143.00
Oats	56.30	Forage seeds	1,439.00
Wheat	639.00		

Commercial forage seed declined somewhat this year, particularly the acreage of creeping red fescue. Estimated yields of forage-crop seeds for 1961, together with the final production figures for 1960, are shown in Appendix No. 11.

The annual seed fair was held at Fort St. John on February 8th, featuring the World Seed Year.

Potatoes

The potato acreage was up slightly this year and yields were generally favourable. Summer drought on some of the highland soils in the Fraser Valley resulted in a heavy cull-out of Gems. Acreage of the Kennebec variety increased again this year in the Fraser Valley. A seed-potato control area has been established on the Creston Flats, indicating the importance of the seed-potato industry developing there.

The main areas of certified-seed potato production are, with acres inspected in 1961 (1960 acreages in parentheses): Vancouver Island, 309 (275); Lower Mainland, 340 (257); Pemberton, 405 (297); Okanagan, 182 (313); Cariboo, 190 (193); Central British Columbia, 53 (12); Boundary District, 215 (355); Kootenays, 414 (400).

One hundred and ten seed-potato samples from growers are again being tested in the greenhouses at the University of British Columbia and the Experimental Farm, Saanichton.

Field Peas

Acreage in field peas was below last year's, but yields were about average.

CROP IMPROVEMENT ASSOCIATION

During 1961 twenty-seven tests were forwarded to members, a decrease from last year, but the alfalfa varieties continued to be popular. Seed of Duraturf creeping red fescue, Rambler alfalfa, and Manchar brome was distributed to seed-growers for production.

DEMONSTRATIONS AND TRIALS

Demonstration trial plots, including fertilizers, herbicides, forage-crops, cereals, and potatoes, were laid down in many areas of the Province. Many of these are on a continuing basis to assess production over several years.

SOIL AND FORAGE ANALYSES

The number of samples of soil and forage-crops analysed increased substantially again this year. The following table indicates the work of our laboratory this year:—

Type of Material Tested	Determinations or Analysis for—	Number of Samples
Soils	Nitrates, phosphorus, potash, calcium, and pH	3,400
	Conductivity (total salts)	200
Irrigation-water	pH and total salts	20
Forage	Crude protein, moisture, pH	197
	Total nitrogen, nitrogen as nitrates	15

AGRICULTURAL LIME

For the eleven-month period ended November 30, 1961, 42,084.36 tons were distributed under the Federal-Provincial Lime Subsidy Policy, an increase over 1960.

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
1956/57	1,052	$52,784.88	21,528.45
1957/58	1,461	100,588.24	34,404.75
1958/59	1,288	99,942.98	36,529.09
1959/60	1,326	122,473.12	41,298.81
1960/61	1,328	117,110.26	39,835.68

FERTILIZER AND AGRICULTURAL POISONS BOARD

No meetings of the Board were held last year, and no changes were recommended in the following approved fertilizer mixes: 0–15–15, 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 in the Peace River area, and one in the Pemberton Valley for a short period in June. We continue to carry out demonstration and trial projects to assess new weedicides for controlling weeds in crops. The Department of Highways has increased its spray programme again this year to include 2,400 miles of roadside.

TORONTO ROYAL WINTER FAIR

There were not as many growers exhibiting in the hay and grain section of the show this year. However, there was good representation in double-cut red clover entries from the Fraser Valley. Our potato-growers did well. Don Wilson, of Ladysmith; John Pendray, of Victoria; and Ross Brothers, of Pemberton, placed first, second, and fourth, respectively, in the Netted Gem class. Mrs. Hays, of Armstrong, took second prize with alfalfa.

GRAIN SCREENINGS

During the first eleven months, January 1 to November 30, 1961, fifteen permits for removal of screenings were issued to elevators and merchants. During the same period thirty-nine feeders' permits were issued.

Nine processing plants are licensed to devitalize screenings. The grinding, pressure and steam, as prescribed, has, in all cases, given excellent devitalization of weed seeds. Eighty-three per cent of the refuse screenings used in British Columbia were pelleted. Prices have advanced slightly on raw refuse and pelleted materials due to large export orders.

FARMERS' INSTITUTES

L. W. JOHNSON, SUPERINTENDENT

One new Farmers' Institute, West Fraser, was incorporated and two inactive institutes, Eaglet Lake and Narcosli Creek, were restored during the year, leaving a total of 129 institutes in operation, with a total membership of 5,611.

During the past ten years, active institutes have decreased by twenty-four and membership by 900. However, the remaining institutes continue to expand, with over-all assets increasing by $370,000 and the purchase of commodities for members by approximately $500,000.

ADVISORY BOARD OF FARMERS' INSTITUTES

The Advisory Board of Farmers' Institutes met in Victoria on October 31st and November 1st and 2nd to deal with seventy-seven resolutions submitted by the ten district institutes and to present a brief to the Provincial Cabinet dealing with such matters as property taxes, social welfare, rural electrification, gasoline prices and coloured gasoline for farm vehicles, land-clearing assistance, and rural road drainage.

EXHIBITIONS AND FALL FAIRS

Sixty-three recognized exhibitions and fall fairs were held in the Province, as follows: One Class A, seven Class B, and ten Class C exhibitions, and forty-five fall fairs.

During the year the Dawson Creek Exhibition was granted Class B status and two fall fairs obtained Class C rating.

POUND DISTRICTS

Six pound districts were constituted in unorganized territory during the year.

Boundaries of six existing pound districts were extended and pound-keepers appointed for eleven.

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 115 licences to sell poisonous substances used exclusively in agriculture were issued.

SOIL SURVEY BRANCH

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

In 1961, soil surveys were undertaken in five areas. In the Lower Fraser Valley, detailed surveys of the Chilliwhack and Sumas Municipalities were completed. A pioneer reconnaissance survey of the Thompson River valley was started, the field party working westward from Salmon Arm. The Covert Irrigation District near Grand Forks and the Osoyoos West Bench were reclassified in detail.

An interim report and soil-map covering Surrey Municipality was completed. A report, "Soil Survey of the Upper Columbia River Valley," was published, and another, "Soil Survey of the Kettle River Valley," has been submitted for publication. A Soils Advisory Committee was formed, which held six meetings, all of which were reported.

CHILLIWHACK AND SUMAS MUNICIPALITIES

The survey of the Chilliwhack Municipality was started in 1960 and completed in the early part of the 1961 field season, involving classification of 13,900 acres in detail. Detailed work in Sumas Municipality amounted to 27,930 acres. Adjacent uplands which occupy an additional 42,120 acres also were classified, but on a reconnaissance scale of mapping. The areas soil-mapped within the two municipalities and in adjacent unorganized territory totalled 82,950 acres. Most of the Sumas soils were assigned to the Acid Brown Wooded soil group. Reports and maps covering Chilliwhack and Sumas Municipalities will be prepared during the winter of 1961/62.

THOMPSON RIVER VALLEY

The objective of this survey is an inventory of soil resources of the entire Thompson Valley region, and will occupy the attention of a soil survey party for several years.

In 1961 the classification was begun from the 1959 reclassification of the North Okanagan Valley. About 54,200 acres were mapped on a scale of detailed reconnaissance from the Salmon Arm area westward to include the Tappen and White Lake localities. In addition, some 47,600 acres of upland were surveyed on a broader scale of mapping.

The usual wide range of soil-forming deposits was encountered. Of main agricultural significance are the alluvial soils of the Salmon River valley, and, at higher elevations, the glacio-lacustrine materials of medium to heavy texture. Soil and climatic variation is the cause of some fifty soil distinctions which were recognized. The soil-group variation is from Brown Wooded to Podzol soils with good drainage, and from Gleysolic to Organic soils under progressive degrees of drainage restriction.

Excepting soils with a high water-table, production could be increased by irrigation, even of the heavy-textured glacio-lacustrine soils which are common in the map-area.

COVERT IRRIGATION DISTRICT

A detailed soil survey of the Covert Irrigation District was undertaken in June and was planned as part of a general investigation in connection with redesign of a worn-out irrigation system.

The Covert Irrigation District adjoins the International Boundary in the vicinity of Carson, about 3 miles west of Grand Forks. A total of 289 acres was classified,

of which 272 are suitable for irrigation. The irrigation requirement of each soil type was estimated. A soil-map and report were completed and supplied to the Water Rights Branch of the Department of Lands and Forests.

WEST OSOYOOS BENCH

This was a reclassification in detail to provide additional information for a proposed development of the area. A total of 1,065 acres was mapped on a scale of 500 feet to 1 inch; 1,008 acres were classed as potentially irrigable.

As part of the job, an investigation of substrata and a study of potential seepage were undertaken. A drainage proposal was prepared which suggested some 23,000 feet of drains, pumps, and other works necessary to afford drainage if 621 acres are irrigated. A report, "A Drainage Proposal for the Northern Part of the West Osoyoos Bench," was completed in July. A Reclamation Committee meeting on this subject was reported in Reclamation Brief No. 40.

SOIL CONSERVATION

Testing for soil abnormalities of samples submitted by farmers and others was continued in 1961. A total of 520 samples was examined for alkali. Of these, about 10 per cent contained black alkali in toxic amounts, and 13 per cent indicated white alkali concentrations which were too great for normal plant growth. Twenty-five samples of water intended for irrigation use also were tested, seventeen being too alkaline for the purpose.

In the Okanagan Valley, sixty farm visits were made and plans prepared for 10,223 feet of drainage-works, which were installed by December 1st. Plans for an additional 3,301 feet of drains are complete, and an investigation of eight additional drainage problems is in progress. In the Lower Fraser Valley, thirty farm visits were made in regard to drainage of 1,320 acres. This Branch and the Agricultural Engineering Branch co-operated in connection with planning of 446,100 feet of drainage-works, of which 82,350 feet were installed by December 1st.

Water-table studies to determine the optimum spacing of tile drains in the Lower Fraser Valley are being conducted at six locations, and three additional locations are planned. Two sediment basins have been installed to study the amount of sediment carried by tile drains in certain soils. A programme to study soil permeability in the field has been started, and the possibility of long-range drainage plots is being investigated.

In the Okanagan Valley, advisory assistance was continued to check the engineering and performance of sprinkler irrigation systems, rates of application, irrigation intervals, and water requirements of soil types. There was co-operation with irrigation districts and with the Research Station, Summerland, on different phases of soil and water conservation.

LABORATORY

Laboratory analyses completed during the past year included soil samples collected in the 1960 field season in the Chilliwack area and on the Colony Farm, Essondale, and on 1961 soil samples from the Cultus Lake and Sumas areas. Progress was made with an investigation of the chemistry of a new group of soils encountered in the Kettle River valley, which in part led to their definition as the Grey Forested soil group. In keeping with the need of information by farmers and others, soil and water samples were examined for alkali content.

AGRICULTURAL DEVELOPMENT AND EXTENSION BRANCH

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

EXTENSION ACTIVITIES

The volume of work performed by the Agricultural Development and Extension staff continues to increase each year as more and more extension methods are being used to encourage improved farm practices and to help rural people to help themselves. Greater use is being made of the services of specialists in poultry, live stock, field crops, engineering and horticulture.

LOWER MAINLAND AND VANCOUVER ISLAND

Mr. J. S. Allin, Supervising Agriculturist in this area, reports a steady increase in dairying, with a definite reduction in the number of dairy-farmers brought about by changing economic conditions. The District Agriculturists report 3,643 farm visits and 7,884 office contacts, as compared with 3,105 farm visits and 6,643 office calls in 1959.

PEACE RIVER, CENTRAL BRITISH COLUMBIA, AND CARIBOO REGION

Mr. S. G. Preston, Supervising Agriculturist, reports special attention being given to analysis of the agricultural needs of the areas with greater use being made of specialists.

Excellent co-operation is being received from Agricultural Planning Committees in Vanderhoof and Burns Lake.

SOUTHERN INTERIOR AND KOOTENAY REGION

This region, from Kamloops to Cranbrook, has a number of areas of specialized agriculture, such as beef production, vegetables, tree fruits, dairying, and poultry. Extension programmes were developed accordingly.

IN-SERVICE TRAINING AND SHORT COURSES

Several staff members attended the Stockmen's Short Course at Washington State University, and Mr. R. C. Bailey attended the Western Regional Summer School at Colorado. Short courses were arranged on swine at Abbotsford and beef cattle at Tranquille. Dairy courses were held in the Kamloops-Okanagan area. Courses on live stock, seed production, etc., were held in the Boundary, Peace River, and other areas.

FARM MANAGEMENT

The farm-management programme undertaken in 1958 continued during 1961, with emphasis on analysis of simple farm records which the individual farmer keeps for himself.

A special publicity campaign was undertaken to make farmers aware of this programme, and five press releases were issued in October and November.

LIVE STOCK

M. G. A. Luyat, Supervising Agriculturist and Live Stock Specialist, reports the beef-cattle industry had a very satisfactory year. Markets strengthened early

in the year when it became apparent that the United States cattle population had been estimated too high. Cows were in short supply as ranchers seemed to be holding on to breeding stock and selling calves and yearlings because of good prices. The large supplies of feed in the United States together with the devaluation of the Canadian dollar were responsible for the substantial prices paid, while the droughty conditions of the Western Prairies made supplies available, thereby saving the short supply of grass for breeding stock. Despite higher grain prices, Prairie feeders began to fill up their feed-lots. Exports of feeder cattle to the United States during the last months of the year increased substantially at remarkably good prices.

Cattle-finishing in British Columbia is not on the increase generally. More interest is being shown in this phase of the industry in the Fraser Valley, where a few operators are attempting to grass-finish yearlings. Properly managed, both pastures and cattle in the Lower Fraser could contribute something to the industry. Grain surpluses in the Peace River have disappeared, and it is not anticipated that the small start in farm finishing of cattle will expand for the present at least.

Some anxiety has been expressed over the closure of the Burns & Company abattoir in Vancouver. Freight rates on live cattle to be processed in the Coast city have made it prohibitive as against the shipment direct from Calgary of dressed carcasses. The trend has been away from grass cattle for slaughter, and since British Columbia does not produce grain-finished cattle, the demand for slaughter facilities in Vancouver has lessened. The ranges of the Interior are now used for the production of feeder cattle for export.

BEEF CATTLE ADVISORY COMMITTEE

Three meetings of this Committee were held during the year. Four Sub-committees were in operation—Cattle Identification, Cattle Finishing and Marketing, Range Management, and Progeny Testing of Sires. As a result of a study made by the Cattle Finishing and Marketing Sub-committee on carcass evaluation and desirability, plans were laid to organize a carcass demonstration for educational purposes at the 1962 bull sale, having in mind that this would be a forerunner to a carcass competition at later shows. Dr. H. H. Nicholson, Animal Husbandman, Range Experimental Farm, Kamloops, replaced Mr. T. G. Willis on the Committee.

THE SHEEP INDUSTRY

There is a general increase in the sheep population of British Columbia despite the lower prices received and the widening differential with cattle prices. Some smaller operations have converted to cattle, but this slack was picked up by others. Several thousand head were imported from Montana and Alberta during the year. The premium payment of $2 and $1 on lamb carcasses rail-graded as 1A and 2B weighing between 36 and 51 pounds, as announced by the Federal Department of Agriculture, taking effect August 14th, has given an impetus to sheep production.

SHEEP FIELD-DAYS

Five sheep field-days organized by the Department of Agriculture were held during May and June at Duncan, Abbotsford, Westwold, Fort Fraser, and Fort St. John, which were very successful. Cross-breeding, live and carcass grading, etc., were emphasized.

HOGS

Hog production is dropping in the Peace River area and will likely continue to do so as long as a remunerative market for grain remains. Production elsewhere

in the Province has been affected by increased grain prices, and an increase is not likely to occur for some time.

A very successful swine field-day was held in Abbotsford in November.

AGRICULTURAL ENGINEERING DIVISION

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

Power and Machinery

Projects

1. *Potato-sprayer.*—The modification to sprayer equipment has been completed this year, with a modified drop-boom and efficient spray-tank agitation being added. Leaf coverage was once again analysed. In addition, careful inspection for aphid-control was observed, with very satisfactory results being obtained in all cases.

Trials were also conducted with an air-blast sprayer. Results do not indicate that this type of equipment is competitive with the drop-boom in so far as per cent coverage is concerned.

2. *Apple-handling.*—As a result of the trial work carried out during the past year, it will be possible to prepare recommendations which will permit both growers and packing-house operators to reduce fruit damage below present levels in both field and plant operations. These recommendations will be prepared and published as a separate report.

3. *Turnip-harvesting.*—Work on a prototype turnip-harvester utilizing several separate units when combined into one machine did not work in a satisfactory manner. This project will not be pursued since modifications would increase its cost to the point where it would not be competitive with equipment presently available.

4. *Forage Machinery.*—This project is just being initiated and will include the study of separate machines to work out the most compatible combination of units and work on mechanization of feeding procedures for all crops but with the emphasis placed on silage.

Tractor-maintenance Courses

These courses still appear popular in the Province. Four separate schools were held, with a total attendance of forty-seven.

Publications

Two new bulletins have been prepared by the Division. These are A.E. 11, "A New Self-propelled Machine for Removing Droppings from Laying-cage Houses," and A.E. 12, "Land-clearing Equipment and Methods."

In addition to this, a paper has been prepared on sprayers, including the most recent information on tests carried out, and a number of reports have been prepared based on project work under way.

Meetings and Field-days

Seven meetings were attended to present information on sprayers and on the work of the Committee on Apple-handling Equipment.

Three field-days on potato-growing were attended to present information on sprayer-development work.

Soil and Water

Drainage

1. *Tile-covering.*—A review of this demonstration indicated that all covering methods followed were effective in controlling sand movement into tile-lines. This project may need to be duplicated in areas where more serious flow problems are encountered.

2. *Pump-flow Trials.*—A project has been set up to check the efficiencies of pumps presently being used for drainage in the Fraser Valley. This will be extended to include tile effluent measurement as a basis of checking drainage coefficient design figures being used at present.

Design of Systems

Work has been continued along the lines of that started in 1960 to carry out topographical surveys on those farms where tile systems are to be installed. Detailed plans were prepared for thirty-six farms, covering a total of 1,830 acres. In addition to this, seven surveys were carried out where surface drainage only was to be installed to provide drainage for 525 acres. In these two basic projects a total of 44,500 feet of open ditch was surveyed in detail. In addition, special emphasis was placed this year on checking outlets to make sure that sufficient fall was obtainable at the major outlet of drainage-ditches.

Talks on drainage were presented at six meetings, and one field-day was attended.

One detailed paper on drainage was prepared for a special night-school course on this subject.

Irrigation

The Departmental irrigation equipment located at Vanderhoof was used on cash crops. The results indicated that irrigation can triple the yield of potatoes and substantially increase the turnip yield within this area, indicating that this is the prime area for consideration of irrigation in Central British Columbia.

Irrigation systems were designed for ten farms, covering 210 acres. In addition, special investigations have been initiated on two area schemes. This work will be of a preliminary nature, with follow-up to be carried out by the districts interested.

Six meetings were attended, at which information was presented on sprinkler irrigation system design and special problems.

Design reports were prepared for two storage dams, with advisory assistance being provided on the design of spillways for three other structures.

Domestic Water

Assistance was provided under the terms of the *Farmers' Land-clearing Assistance Act* on the construction of eight dugouts. Some problems are still being encountered in controlling seepage in dugouts constructed in laminar silts and clays. No simple solution is apparent at present.

Farm Structures

Project

Potato-storage Ventilation.—This project is in its second year. Results from the first year were not too indicative, but results from this winter's operation should provide some basic data on the design of forced-air ventilation of future potato-storage structures.

Plans

This Division has distributed 4,630 plan sets, with plans being obtained primarily from the Farm Building Plan Service, together with other sources. In addition to this service, individual assistance has been provided on seven farm structure layouts.

General

In all phases of work, much information has been supplied in answer to individual letters of inquiry. In addition, it has been possible to augment our supply of reference material to better answer such queries.

Land Clearing and Development

Through the operations of the *Farmers' Land-clearing Assistance Act,* initiated in 1946, there has been in excess of $4,000,000 worth of work completed for farmers in the Province. Over 100,000 acres of land have been cleared, 40,000 acres broken, and 1,400 acres drained. An additional $250,000 has been spent on repiling, double disking, farm roads, clearing fence-lines, constructing dugouts, levelling, and other earth work, including 7,900 separate contracts.

During 1961, private contractors were again utilized to carry out the development work. In all, negotiations were made with sixty-nine contractors, involving eighty-one crawler-type tractors, eight scrapers, sixteen back-hoes, fourteen draglines, two well-drilling rigs, and three wheel-type trenchers.

Up to November 30th of the 1961 operating year, approximately 7,442 acres were cleared and 4,075 acres broken.

The final figures for the fiscal year 1960/61 show 10,600 acres cleared and 5,500 acres broken.

Summary of Land Clearing and Development, 1961

District	Acres Cleared	Acres Broken	Cost per Acre for Clearing	Cost per Acre for Breaking
Vancouver Island	140	.....	$91.00	.....
Fraser Valley and Pemberton	491	.....	100.00	.....
Okanagan, Shuswap, and Kamloops	492	.....	56.00	.....
Boundary and Kootenays	100	.....	75.00	.....
Cariboo, Prince George, McBride	1,589	1,159	34.00	$8.00
Vanderhoof, Smithers, Terrace	683	463	27.00	9.00
South Peace River	2,004	1,485	19.00	9.00
North Peace River	1,943	939	15.00	9.00

HOME ECONOMICS

(Miss Lorna R. Michael, B.Sc. (H.E.))

Commencing June 19th a Home Economics office was added to the 4-H Club Division, with headquarters in Victoria. The duties of the Home Economist included both office and field work related to the organization of a 4-H Homecraft programme througout the Province.

Leaflets are now available on such subjects as clothing construction, textiles, food cookery and preservation, nutrition, home management, child-care, home planning and home decorating, besides supplementary 4-H project information. Further demands from adults also necessitated preparation of twenty additional mimeographed sheets on Home Economics subject-matter. A total of 1,588 bulletins and project material has been sent out in this six-month period.

A total of twenty-two leaders' meetings was held, with over 100 leaders, District Agriculturists, and members present.

After a survey of the needs of Homecraft leaders and members, six projects were outlined for Clothing Club members, two for Foods, and one for Home Beautification. Senior Homecraft proficiency examinations were set for Clothing and Food members, a total of seventy being written. Clothing Club members in various areas were instructed as to their participation in local dress revues, and eighteen girls from all parts of British Columbia competed for the Dress Revue Queen crown at the Pacific National Exhibition. Instruction was given to leaders and club members on techniques of demonstrations, and assistance was given in judging numerous demonstration competitions.

4-H CLUB DIVISION

(R. C. Bailey, B.S.A., P.Ag., Supervisor)

Enrolment

In 1961 club membership rose to an all-time high of 263 clubs containing 3,260 members. This is an increase in membership of close to 10 per cent over 1960 and 21 per cent over 1959. Nearly all projects registered an increase in both clubs and members, with the largest increase in live-stock projects.

Project Work

Records show that 4-H members raised 520 beef animals, 982 dairy calves, 58 goats, over 6,000 chickens, 275 rabbits, 364 sheep, 234 hogs, grew 18 acres of grain, and raised over 200 gardens. More than 500 girls made over 2,000 articles for their wardrobes and homes, while some seventy-five boys looked after and maintained as many farm tractors. Altogether, these members completed more than 2,700 projects, valued at approximately $250,000.

Club Activities

Field-days to give club members experience in judging and demonstrations were held in nearly every district of the Province. In addition, public speaking and demonstration competitions were held to add opportunities for personal development.

The first 4-H Club rally in British Columbia was held in Cloverdale this year and proved to be a successful way of testing 4-H Club members on the various skills they learn in club work.

Provincial Club Week

Again this year, Provincial Club Week was held at Tranquille in July. During the week, 4-H members were given training in leadership, farm and home planning, farm safety, and careers, and selections made for the following awards:—

(1) Canadian National Exhibition scholarship of $600 awarded to Mr. Jim Thompson, of Salmon Arm.

(2) Award trip to the National 4-H Conference in Washington, D.C., in April, 1962, to Miss Kathy Bechtold, of Armstrong.

(3) Award trip to attend National Club Week in Toronto and Ottawa in November, 1961, to Miss Rose Couling, Coombs; Miss Jacquelyn Rosman, Saanich; Miss Julia Hansen, Ladner; Miss Sharon McArthur, Cloverdale; Miss Dierdre Gorsuch, Langley; Miss Roberta Armistead, Langley; Mr. Albert Anderson, Langley; Mr. Arthur Brooke, Pitt Meadows; Mr. Chris Finch, Dewdney; Mr. Barry Brady, Heffley Creek; Miss Helen Curylo, Chilliwack; Mr. Ken Neuman, Barriere; Miss Janice Smith, Armstrong; and Miss Karen Hendricks, Dawson Creek.

Other awards included a trip to the National 4-H Club Congress to Miss Dolores Sandstrom, sponsored by the 4-H Leaders' Council at Mission, and a trip to the State 4-H Conference in Pullman, Wash., to Miss Gwen Long, McBride; Mr. Jon Long, Quesnel; Miss Patricia Keith, Engen; and Mr. Howard Harding, Telkwa.

Pacific National Exhibition

Again this year, twenty-six boys and girls from Central British Columbia and the Peace River were assisted by the Norgan Foundation to attend the Pacific National Exhibition and take part in competitions. Each district in British Columbia sent its best members to compete in judging, demonstrations, and dress revue events.

Leadership Development

Eight regional workshops were held during February and March at Dawson Creek, Vanderhoof, Kamloops, Armstrong, Chilliwack, Mission, Cloverdale, and Nanaimo. A total of 281 leaders and assistant leaders was contacted by these workshops.

Over eighty senior 4-H Club members enrolled in the Junior Leadership project, designed to provide experience and knowledge in leadership skills. In addition, nine adult leaders received their five-year certificate, seven their ten-year certificate, and one a fifteen-year certificate in recognition of contributions made to rural youth.

Summer Assistants

Five students from the University of British Columbia assisted with the 4-H programme this past summer and assisted with the heavy schedule of 4-H activities during the busy summer months.

SOUTHERN OKANAGAN LANDS PROJECT

F. O. McDonald, Manager

During the year no serious interruption of water-supply occurred and leaks developing in the wood-stave system were normal. No damage to orchards was caused as a result of the repair programme.

Domestic services were expanded, and now stand at 564 residential; 80 commercial; 6 industrial; 50 meters in operation. Hydrant pressure was 70 to 120 p.s.i. and water temperature averaged 55 degrees.

Water was turned into the canal on April 17th, the earliest in many years, and pumping-stations were started on May 1st. The canal was put at full flow on June 15th and continued until September. Water was kept in the main canal until October 19th for floating timber into place in the renewal section and for ordinary replacement throughout the system.

Another 3,000 feet of main canal was waterproofed by cleaning, foundation sealing, and the application of fibreglass and hot asphalt. Generally, this appears to be an economical method of waterproofing concrete under water.

The dormant spraying of ditch sides and bottom with copper sulphate was continued. It is apparent that algæ and aquatic growth are discouraged by application of a strong solution. There was no dangerous concentration of solution after an initial run of four or five hours.

Instead of one large crew with a general foreman, three crews were used this year for the first time in an effort to speed up the winter work programme. This resulted in an earlier turn-on of water for irrigation.

Winter water for cisterns was not supplied this year, being too close to the freezing point to risk running it into the canal. Water temperature of 38 degrees or higher is required for this purpose.

LAND SETTLEMENT BOARD

During the year the sales made by the Board amounted to $69,282.40. Twenty-nine purchasers completed payment and received title deeds, and four borrowers paid up in full and received release of mortgage.

Collections were as follows:—

Loans	$12,501.39
Land sales	50,192.20
Dyking loan refunds, etc.	1,666.83
Foreclosed properties and areas, rentals, etc.	6,053.85
Total	$70,414.27

The above figures include collections from the sale and rental of Doukhobor lands in the amount of $29,638.56.

DYKING AND DRAINAGE DISTRICTS

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

This year's freshet in the Fraser River was of normal proportions, with the river reaching its peak of 20.6 feet on the Mission gauge on June 6th. Patrols were placed on the most vulnerable dykes for a period of about ten days while the river was at or above the 20-foot reading.

Amendments were enacted to the *Sumas Drainage, Dyking, and Development District Act* and to the *Dyking Assessment Adjustment Act, 1947,* during the 1961 Session which were intended to broaden the basis of assessment and thereby provide greater revenue to the districts to which these Acts apply. The new legislation increased minimum taxes in the Sumas District from $2 to $5 for any separate parcel of land, and also permitted the district to impose a 5-mill levy on 75 per cent of the assessed value of improvements. Revenues were thereby increased from $85,000 in 1960 to $103,000 in 1961, reducing some of the district's accumulated deficit position.

The Matsqui and Nicomen Districts carried out extensive rock placement on river-banks and enlarged their quarry operations, while Harrison Mills and Silverdale electrified pumping-stations.

All of the districts, excepting Surrey, carried out fairly substantial river-bank protection projects during the year.

Creston area was threatened by a very high freshet in the Kootenay River this year. The Department of Highways, the Army, and other agencies provided very necessary and helpful assistance to the local dyking authorities in combating this threat and in preventing dyke failures.

APPENDICES

APPENDIX No. 1

Slaughtering in Abattoirs Licensed under Stock Brands Act and Provincial Meat Inspection Act

	1957	1958	1959	1960, First Six Months	1960, Second Six Months	1961, First Six Months
Cattle						
Licensed under *Stock Brands Act* and Provincial *Meat Inspection Act*	2,639	3,258	2,759	2,205	2,970	3,086
Licensed under *Stock Brands Act*	15,235	15,955	17,341	9,336	10,650	8,854
Totals	17,874	19,213	20,100	11,541	13,541	11,940
Calves						
Licensed under *Stock Brands Act* and Provincial *Meat Inspection Act*	2,342	5,087	5,206	5,743	10,334	7,545
Licensed under *Stock Brands Act*	5,548	6,392	11,065	4,794	5,991	3,194
Totals	7,890	11,479	16,271	10,537	16,325	10,739
Swine						
Licensed under *Stock Brands Act* and Provincial *Meat Inspection Act*	4,381	4,396	5,346	5,258	5,224	8,333
Licensed under *Stock Brands Act*	10,852	13,803	15,713	7,251	8,579	8,308
Totals	15,233	18,199	21,059	12,509	13,803	16,641
Sheep						
Licensed under *Stock Brands Act* and Provincial *Meat Inspection Act*	17	35	17	150	201	137
Licensed under *Stock Brands Act*	593	514	604	406	288	419
Totals	610	549	621	556	489	556
Lambs						
Licensed under *Stock Brands Act* and Provincial *Meat Inspection Act*	220	330	488	214	418	350
Licensed under *Stock Brands Act*	2,613	3,569	3,773	2,709	2,353	2,288
Totals	2,833	3,899	4,261	2,923	2,771	2,638

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	128	2	7	6	45
West Kootenay	140	1	9	10	40
North Okanagan	770	3	6	3	158
South Okanagan	429	-----	9	2	77
Central British Columbia	425	-----	21	5	145
Fraser Valley	3,580	-----	68	-----	2,054
Vancouver Island	704	4	17	27	266
North Bend	5	-----	-----	1	-----
Pemberton-Sechelt	32	-----	1	4	5
Sandspit	1	-----	-----	1	-----
Totals	6,221	10	138	59	2,790

Three hundred and fifty-five additional notices of cancellation were mailed out in Milk Board area where the dairy-farmer notified the Board of cessation of operations.

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

APPENDIX No. 3

Cattle and Hide Inspections, 1961

District	Cattle	Hides
Cariboo—		
Quesnel	2,981	382
Williams Lake, Alexis Creek	13,468	304
Clinton, Lac la Hache, 100 Mile House, Graham Siding, Bridge Lake, Lone Butte	6,525	75
Lillooet, Pavilion, Bralorne	886	5
Bella Coola	.....	10
	23,860	776
Kamloops, Nicola, etc.—		
Kamloops, Chase	28,330	917
Merritt	10,212	276
Ashcroft, Lytton, etc.	9,367	14
Salmon Arm	2,267	877
	50,176	2,084
Okanagan—		
Vernon, Lumby, Falkland	6,330	1,167
Armstrong, Enderby, Sicamous	3,442	373
Kelowna	4,343	2,861
Penticton, Summerland	934	17
Oliver, Osoyoos	5,088	768
	20,137	5,186
Similkameen—		
Princeton, Keremeos, etc.	3,506	215
Grand Forks, Greenwood	3,386	297
	6,892	512
South-eastern British Columbia—		
Rossland, Crescent Valley	261	218
Nelson, Creston, etc.	2,502	1,290
Cranbrook, Fernie, etc.	5,143	619
Invermere, Golden	1,039	39
	8,945	2,166
Central British Columbia—		
Prince George, Vanderhoof	1,708	1,272
Smithers, Giscome, etc.	1,176	608
Burns Lake	1,160	42
	4,044	1,922
Peace River—		
Fort St. John	4,455	673
Dawson Creek	7,842	1,874
	12,297	2,547

Totals Compared

District	1961		1960		1959	
	Cattle	*Hides*	*Cattle*	*Hides*	*Cattle*	*Hides*
Cariboo and South	23,860	776	20,786	845	25,249	875
Kamloops and Nicola	50,176	2,084	47,279	1,965	41,702	1,747
Okanagan and Similkameen	27,029	5,698	25,976	4,579	22,572	3,789
South-eastern British Columbia	8,945	2,166	7,784	1,970	7,395	2,046
Central British Columbia and Peace River	16,341	4,469	13,835	4,630	15,604	5,858
Totals	126,351	15,193	115,660	13,989	112,522	14,315

APPENDIX No. 4

Breed Averages for 1960

Breed	Percentage of Total D.H.I.		Milk (Pounds)		Fat			
					Per Cent		Pounds	
	1959	1960	1959	1960	1959	1960	1959	1960
Ayrshire	3.3	3.2	9,407	9,321	4.11	4.13	387	385
Guernsey	13.9	13.3	8,920	8,918	4.82	4.84	430	431
Holstein	58.0	60.7	11,879	11,735	3.76	3.80	447	446
Jersey	15.5	14.2	7,835	7,864	5.17	5.21	405	410
Unclassified (cross-breds, etc.)	9.3	8.6	9,937	10,181	4.40	4.35	437	443

1959 figures shown for comparison.

APPENDIX No. 5

Animal Pathology Specimen Examinations

Specimen	Chickens	Turkeys	Cattle	Horses	Sheep	Swine	Fur-bearers	Miscellaneous	Total
Miscellaneous	3,034	875	106	19	23	41	238	1,030	5,366
Serology	2,563	265	229	------	------	4	------	2	3,063
Totals	5,597	1,140	335	19	23	45	238	1,032	8,429

APPENDIX No. 6

Poultry-flock Approval

	Number of Flocks	Number of Birds Pullorum-tested	Average Number of Birds per Flock	Per Cent Reactors
1961	148	260,146	1,757.7	0.1137
Five-year average, 1956 to 1960, inclusive	159	261,803	1,691.1	0.0459

APPENDIX No. 7

Breeds Approved for Egg Production

Breed	Total, 1961	Total, 1960
Barred Plymouth Rock	1,504	298
Black Australorp	856	1,825
California Grey	182	117
Columbia Plymouth Rock	------	63
Hampbar	536	228
Light Sussex	1,720	2,159
New Hampshire	7,128	15,471
Rhode Island Red	5,263	1,197
Rhode Island White	1,433	------
S.C. White Leghorn	95,223	80,733
White Plymouth Rock	4,498	2,774
Cross-bred	662	3,154
Totals	119,005	108,020

APPENDIX No. 8

Turkey-flock Approval

	Number of Flocks	Number of Birds Pullorum-tested	Average Number of Birds per Flock	Per Cent Reactors
1961	7	9,609.0	1,372.70	0.0000
Five-year average, 1956 to 1960, inclusive	24	18,817.2	840.12	0.0094

APPENDIX No. 9

Turkey-flock Approval by Breed

Breed	1961	1960
Broad Breasted Bronze	6,041	12,837
Broad Whites	1,928	2,297
Jersey Buff	------	310
Medium Whites	------	238
Small Whites	1,640	------
Totals	9,609	15,232

APPENDIX No. 10

Amount and Kind of Vaccine Distributed

Type of Vaccine	1961	1960	1959	1958	1957
Newcastle disease	13,751,400	8,829,800	8,747,150	6,171,710	5,149,350
Infectious bronchitis	3,184,900	1,816,600	1,851,450	1,986,000	1,628,950
Totals	16,936,300	10,646,400	10,598,600	8,157,710	6,778,300

APPENDIX No. 11

Production of Grass and Legume Seeds, 1960–61

	Production (Final), 1960	Estimated Production, 1961
	Lb.	Lb.
Alfalfa	70,000	160,000
Red clover, single	500,000	410,000
Red clover, double	153,000	145,000
Alsike clover	2,499,000	1,800,000
Sweet clover	160,000	350,000
White clover	23,600	52,000
Timothy	200,000	220,000
Timothy-alsike	56,700	60,000
Brome	175,000	200,000
Blue-grass, Kentucky	60,000	7,300
Crested wheat	36,500	20,000
Creeping red fescue	4,500,000	3,580,000
Meadow fescue	25,000	19,000
Orchard-grass	1,000	1,000
Red-top	11,000	------
Chewing's fescue	8,000	10,000
Birdsfoot trefoil	1,500	1,800

APPENDIX No. 12

Movement of Feed-grains under Federal Freight Assistance Policy into British Columbia for the Fiscal Years Shown

Feed	1955/56	1956/57	1957/58	1958/59	1959/60	1960/61
	Tons	Tons	Tons	Tons	Tons	Tons
Wheat	78,932	87,076	82,184	78,761	90,484	82,818
Oats	54,603	41,002	36,343	39,848	48,601	43,307
Barley	32,562	31,455	31,315	32,510	49,479	53,818
Rye	121	5	.....	6	.....	74
Corn (Manitoba and west)	3,745	2,887	2,652	1,520	1,943	1,588
Screenings	2,015	2,211	2,946	7,929	8,935	5,427
Mill-feeds	44,504	40,463	38,251	36,210	47,129	45,117
Totals	216,482	205,099	193,691	196,784	246,571	232,149
Total subsidy	$1,287,185.51	$1,265,865.43	$1,512,679.96	$1,560,253.08	$2,096,297.96	$1,915,644.93
Average per ton subsidy	$5.94	$6.17	$7.81	$7.93	$8.50	$8.25

APPENDIX No. 13

Production of Tree-fruit Crops in British Columbia for 1960 and Estimate for 1961

	1960 Production			1961 Estimate of Total Production
	Fresh Sales	Processed Sales	Total Production	
	Lb.	Lb.	Lb.	Lb.
Apples	189,864,000	52,251,000	242,115,000	198,736,000
Crab-apples	1,529,000	1,963,000	3,492,000	1,573,000
Pears	23,897,000	8,542,000	32,439,000	29,416,000
Plums	303,000	28,000	331,000	430,000
Prunes	6,913,000	2,494,000	9,407,000	10,488,000
Cherries	4,560,000	903,000	5,463,000	9,032,000
Peaches	16,392,000	13,069,000	29,461,000	24,695,000
Apricots	9,484,000	5,786,000	15,270,000	12,203,000
Totals	252,942,000	85,036,000	337,978,000	286,573,000

APPENDIX No. 14

Total Acreage of Small Fruits by Areas in British Columbia in the Fall of 1960

	Vancouver Island	Lower Mainland	Okanagan	Creston	B.C. Totals
Strawberries	213.7	1,066.6	62.1	47.6	1,390.0
Raspberries	7.2	1,272.1	14.5	31.9	1,325.7
Blueberries	5.2	857.7	.....	.....	862.9
Cranberries	.....	147.6	.....	.....	147.6
Blackberries	14.8	31.5	.....	0.5	46.8
Loganberries	216.4	11.7	.....	.....	228.1
Boysenberries	0.2	0.9	.....	.....	1.1
Black currants	3.0	1.3	.....	0.6	4.9
Red currants	0.4	1.3	.....	0.8	2.5
Gooseberries	0.3	0.5	.....	0.7	1.5
Others	1.2	0.5	.....	.....	1.7
Totals	462.4	3,391.7	76.6	82.1	4,012.8

APPENDIX No. 15

Production of Small Fruits, Grapes, and Filberts for 1960 and Estimate for 1961

	1960 Production			1961 Estimate of Total Production
	Fresh Sales	Processed Sales	Total Production	
	Lb.	Lb.	Lb.	Lb.
Strawberries	1,411,000	5,984,000	7,395,000	7,487,000
Raspberries	727,000	10,592,000	11,319,000	10,097,000
Loganberries	105,000	990,000	1,095,000	1,194,000
Blackberries	58,000	344,000	402,000	490,000
Black currants	33,000	6,000	39,000	32,000
Red currants	20,000	15,000	35,000	33,000
Gooseberries	19,000	10,000	29,000	24,000
Blueberries	183,000	1,480,000	1,663,000	1,889,000
Cranberries	------	202,000	202,000	405,000
Grapes	491,000	838,000	1,329,000	3,264,000
Filberts	136,000	------	136,000	207,000
Totals	3,183,000	20,461,000	23,644,000	25,122,000

APPENDIX No. 16

Estimate of the Acreage and Production of Selected Vegetable-crops in British Columbia for 1961

Kind of Vegetable	Acreagee	Production
		Lb.
Asparagus	500	993,000
Beans	1,439	10,881,000
Beets	141	2,514,000
Broccoli	208	1,265,000
Brussels sprouts	37	200,000
Cabbage	468	6,986,000
Carrots	468	11,056,000
Cauliflower	537	5,455,000
Celery	176	3,843,000
Corn	3,715	19,807,000
Cucumbers, outdoor	488	5,731,000
Cucumbers, hothouse	------	1,684,000
Lettuce, field	526	7,830,000
Mushrooms	------	1,851,000
Onions	524	10,073,000
Peas	10,792	24,346,000
Potatoes, early	1,886	19,293,000
Potatoes, late	7,341	133,432,000
Spinach	124	986,000
Tomatoes, field	885	16,849,000
Tomatoes, hothouse	------	3,260,000
Turnips	225	4,719,000
Other vegetables	760	8,518,000
Totals	31,240	301,572,000

APPENDIX No. 17

Tree-fruit Nursery-stock Production in British Columbia, 1958 to 1961

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

APPENDIX No. 18

Comparison of Apple-tree Numbers by Variety, 1958 to 1961

Variety	1958	1959	1960	1961
McIntosh	90,277	44,663	29,160	29,827
Delicious	72,520	47,524	25,013	25,210
Golden Delicious	37,120	39,783	10,758	16,950
Spartan	29,010	39,096	18,671	26,477
Winesap	14,455	14,212	2,939	2,610
Rome Beauty	.....	2,954	1,203	1,401
Gravenstein	5,480	16,167	10,304	11,106
Tydeman's Red	.....	.....	3,087	8,624
Yellow Transparent	.....	8,319	7,600	8,104
Antonovka	13,250	10,157	2,580	1,201
Yellow Newtown	.....	.....	1,315	4,712
Canada Baldwin	.....	22,253	13,106	7,907
Haralson	3,990	7,610	1,285	2,035
Hibernal	.....	.....	4,430	1,850
Other (mostly prairie) varieties	.....	.....	16,720	30,907

APPENDIX No. 19

Apple Root-stocks Grown in British Columbia for Sale as Nursery Stock, 1959 to 1961

Type of Stock	Number of Trees Grown			Approximate Percentage		
	1959	1960	1961	1959	1960	1961
EM II	79,641	28,609	50,760	27.0	18.9	28.4
EM IV	7,200	920	740	2.5	0.6	0.4
EM VII	58,489	42,689	38,357	19.9	28.3	21.4
EM IX	16,335	12,058	7,787	5.6	8.0	4.4
EM XVI	.....	515	350	.....	0.3	0.2
MM 104	895	1,558	6,288	0.3	1.0	3.5
MM 106	3,650	1,827	2,950	1.2	1.2	1.7
MM 109	3,110	1,075	937	1.1	0.7	0.5
MM 111	1,915	532	3,120	0.7	0.4	1.7
Seedling (McIntosh)	122,411	45,845	46,613	41.7	30.3	26.1
Hibernal	.....	10,220	6,507	.....	6.8	3.6
Antonovka (seedling)	.....	5,248	14,500	.....	3.5	8.1

APPENDIX No. 20

PUBLICATIONS PRINTED IN 1961

Reports

Annual Report of the Department of Agriculture, 1960.
The Climate of British Columbia, 1960.
Agricultural Statistics, 1960.
Annual Report of the Milk Board, 1960.

Bulletins

Feeding Dairy Cows in British Columbia.
Silos.
Observations on Strawberry Varieties as Grown in the Fraser Valley.
Strawberry Growing with Particular Application to the Fraser Valley.
Ticks and Man.
Raspberry Varieties as Grown in the Fraser Valley.
An Introduction to the Tree Fruit Industry of British Columbia.
Red Raspberry Growing with Particular Application to the Fraser Valley.
Garlic.
Storage Onion Production in British Columbia.
Wild Oats.
Soil Organic Matter.
Soil Reaction.
Clover Seed Growers. Why Gamble? Use Bees.
Control Potato Leafroll.
How to Take Soil Samples.
Exhibition Standards of Perfection for Dairy Products, Poultry Products, and Honey.
Exhibition Standards of Perfection for Vegetables and Field Crops.
Exhibition Standards of Perfection for Fruit and Flowers.
A New Self-propelled Machine for Removing Droppings from Laying-cage Houses.
Beehive Construction for Beginners.
Propagation and Grafting of Fruit Trees.
Chemical Fertilizers.
White Muscle Disease in Calves and Lambs.
Grape Growing in British Columbia.
Bovine Mastitis.
Peach Leaf Curl.
Bacterial Ring-rot of Potatoes.
Some Factors Affecting Production of Greenhouse Tomatoes.
Peat and Muck Soils.
Alkaline and Saline Soils.

Charts

Chemical Weed Control, 1961–63.
Control of Tree-fruit Pests and Diseases, 1961–62.
Control of Vegetable and Field Crop Pests and Diseases, 1961–62.
Fertilizer Recommendations for the Lower Mainland, 1961.
Spray Calendar for Coniferous Evergreens and Roses.
Forage Crop Recommendations for Vancouver Island, 1961–62.
Control of Tree-fruit Pests and Diseases, Interior Districts, 1961.

Miscellaneous

Regulations Covering Fruit, Vegetables, and Honey.
List of Publications.
A Survey of the Quality of Newly Laid Eggs on Farms in British Columbia.
Performance of Broilers Fed Different Rations in the Fifth and Sixth Random Sample Poultry Tests.

Printed by A. SUTTON, Printer to the Queen's Most Excellent Majesty
in right of the Province of British Columbia.
1962

860-362-8782