PROVINCE OF BRITISH COLUMBIA

Department of Agriculture

FIFTY-EIGHTH

ANNUAL REPORT

1963

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1964

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 1963.

FRANK RICHTER,
Minister of Agriculture.

Department of Agriculture,
Victoria, B.C.

BRITISH COLUMBIA DEPARTMENT OF AGRICULTURE

DEPARTMENTAL STAFF, 1963

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Honourable FRANK RICHTER

Minister's Secretary:
Miss M. JEWELL

Deputy Minister:
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N. L. CAMSUSA, Administrative Assistant, Victoria.
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B. K. OXENDALE, Clerk, Publications Branch, Victoria.

Markets and Statistics:

M. M. GILCHRIST, B.S.A., Markets Commissioner, Victoria.
K. ELGAARD, B.A., Economist, Victoria.
R. M. WILSON, B.S.A., Agriculturist, Kelowna.

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.
I. C. CARNE, B.S.A., District Horticulturist, Abbotsford.
W. D. CHRISTIE, B.S.A., Horticulturist (Greenhouse and Nursery Crops), Vancouver.
E. M. KING, B.S.A., M.S.A., Horticulturist (Vegetables), Kelowna.
A. E. LITTLER, B.S.A., District Horticulturist, Victoria.
E. B. MACDONALD, B.S.A., District Horticulturist, Creston.
W. F. MORTON, B.S.A., District Horticulturist, Kelowna.
M. G. OSWELL, B.S.A., District Horticulturist, Vernon.
W. S. PETERS, B.S.A., Assistant District Horticulturist, Kelowna.
J. E. SWALES, B.S.A., District Horticulturist, Penticton.
J. C. TAYLOR, B.S.A., Assistant District Horticulturist, Abbotsford.
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.
J. L. WEBSTER, B.S.A., Horticulturist (Vegetables), Vancouver.

Apiary:

J. CORNER, Provincial Apiarist, Courthouse, 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.
R. L. WILKINSON, B.S.A., Assistant Live Stock Commissioner, Victoria.

Live Stock—Continued

J. C. BANKIER, B.V.Sc., Veterinary Inspector and Animal Pathologist, Vancouver.
J. A. MACE, Superintendent, Dairy Herd Improvement Association, Victoria.
T. MOORE, Recorder of Animal Brands, Victoria.
T. R. B. BARR, B.Sc., B.Sc.(Vet.), M.R.C.V.S., M.V.Sc., Ph.D., Veterinary Inspector and Animal Pathologist, Vancouver.
T. J. BATTEN, Brand Inspector, Kamloops.
J. B. CLAPP, D.V.M., V.S., Veterinary Inspector, Vernon.
F. C. CLARK, B.S.A., M.S.A., Live Stock Inspector, New Westminster.
C. C. CUNNINGHAM, B.S.A., D.V.M., V.S., Veterinary Inspector, Nelson.
A. J. DUCK, Brand Inspector, Kamloops.
J. R. HANNAM, Inspector, Dairy Herd Improvement Association, Chilliwack.
H. JOHNSON, Inspector, Dairy Herd Improvement Association, Abbotsford.
E. V. LANGFORD, D.V.M., V.S., D.V.P.H., Veterinary Inspector and Animal Pathologist, Vancouver.
P. G. LAWRENCE, Inspector, Vancouver.
Mrs. A. B. MAH, B.Sc., Bacteriologist, Vancouver.
W. C. NEWBY, D.V.M., V.S., Veterinary Inspector, Abbotsford.
R. PIGEON, Brand Inspector, Williams Lake.
K. H. THOMPSON, D.V.M., V.S., Veterinary Inspector, Prince George.
J. G. WALKER, D.V.M., V.S., Veterinary Inspector, Abbotsford.
Miss E. A. WHITESIDE, B.Sc., Bacteriologist, Vancouver.

Dairy:

K. G. SAVAGE, B.S.A., M.Sc., Dairy Commissioner, Victoria.
R. N. HITCHMAN, B.S.A., Dairy Inspector, Vancouver.
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.
R. C. BENTLEY, Resident Supervisor, Random Sample Poultry Test Station, Abbotsford.
H. C. GASPERDONE, B.S.A., Poultry Inspector, Abbotsford.
D. M. HAMILTON, B.S.A., Poultry Inspector, Nanaimo.
N. J. SUPEENE, B.S.A., Poultry Inspector, Abbotsford.
C. W. WOOD, B.S.A., Poultry Inspector, 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.
H. CROCKARD, Potato Specialist, Vancouver.
E. C. HUGHES, B.S.A., Assistant in Field Crops, New Westminster.
J. H. NEUFELD, B.S.A., Soil Analyst, Victoria.

Farmers' Institutes:

L. W. JOHNSON, Superintendent, Victoria.

Soil Survey:

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

Agricultural Development and Extension:

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

Dyking Commissioner and Inspector of Dykes:

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

Deputy Dyking Commissioner:

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

Institutional Farms:

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

Milk Board:

E. C. CARR, Chairman, Vancouver.
W. J. ANDERSON, B.S.A., M.Sc., Ph.D., Member, Vancouver.
J. D. HONEYMAN, Member, Ladner.
G. T. BELL, Chief Clerk, Vancouver.
G. CROTHERS, Inspector, Kelowna.
E. D. DAUM, Accountant, Vancouver.
A. S. DIXON, Inspector, Nanaimo.
K. W. LEE, Inspector, Vancouver.
J. W. MCINTOSH, Inspector, Vancouver.

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Report of the Department of Agriculture

REPORT OF THE DEPUTY MINISTER OF AGRICULTURE

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

SIR,—I have the honour herewith to present the Fifty-eighth Annual Report of the Department of Agriculture for the year ended December 31, 1963.

As in past years, the Report comprises a brief summary of agricultural conditions in the Province in addition to a review of activities of all branches and divisions of the Department during the year. Detailed information is on file and is available for reference purposes.

Although weather conditions were not altogether favourable during the growing season, most major crops, with the exception of grain in the Peace River District, made satisfactory yields. The grain crop was reduced by about one-third below the long-term average by severe drought. Production of forage crops was also hampered in the Peace River and Central British Columbia to the extent that a programme of assistance to live-stock growers in these areas in the securing of sufficient stocks for winter feeding was instituted by the Government in co-operation with the Federal Government and the railway companies.

Elsewhere on the agricultural scene, production was well maintained and even increased in some instances, notably in apples and eggs, the latter reaching an all-time record. Farm prices remained generally steady, although a definite softening occurred in cattle prices during the year.

On balance, production and price declines in some sectors were largely offset by increases in others, resulting in a total farm cash income only fractionally below the record high figure achieved in 1962. Preliminary estimates place the total income realized from the sale of farm products at $150,146,000, down $1,500,000 from that of the preceding year.

In co-operation with the Agricultural Rehabilitation and Development Administration (A.R.D.A.), several projects for the betterment of agricultural operations in various parts of the Province were drawn up during 1963. A number were approved for development, including five proposed community pastures, three soil- and water-conservation measures involving both drainage and irrigation, and one research project.

One project submitted earlier was still awaiting approval, and five others were submitted in December to the Federal Minister of Agriculture, making a total of 15 in all recommended by the Province. The total estimated cost of these projects as submitted to date is about $1,200,000.

Among the highlights of the Department's activities was the organization during the latter months of the year of an exploratory markets mission to Latin America and the Caribbean. The field work in appraising market prospects for British Columbia farm products was carried out under direction of the Markets Commissioner. In all, 11 countries were visited. Results indicated that a growing demand exists in this area for such products, which could be developed with proper planning and promotion.

Unfortunately, during the year a Research Officer engaged to advise on A.R.D.A. projects, assume leadership in the farm-management services, and conduct economic analyses generally remained with the Department only a few months before returning to an improved position with his previous employer. By the end of the year, plans had been laid to make a replacement appointment, which, it is hoped, will strengthen this aspect of the Department's work.

The Department has continued to make use of television as a medium to convey useful and informative material to viewers in the Peace River and Okanagan-Kamloops areas. In the latter, more attention has been paid to developing programme material of a general agricultural nature.

LEGISLATION

Eight Acts respecting agriculture were amended this year, the amendments for the most part being of a technical nature. Of some interest, however, was a change in the definition of the word " dealer," and provision for the use of identification brands on breeding cattle in the *Stock Brands Act Amendment Act, 1963,* and provision in the *Milk Industry Act Amendment Act, 1963,* for the establishment of a milk-shippers' protection fund aimed at eliminating losses incurred through bankruptcy of receivers or from unsatisfied claims.

APPOINTMENTS

H. Riehl, B.S.A., Dairy Inspector, April 1st.

K. Elgaard, B.A., Research Officer, May 6th.

F. E. Harper, B.S.A., Assistant District Agriculturist, May 6th.

W. S. Peters, B.S.A., Assistant District Horticulturist, May 13th.

J. Cotic, B.Sc., Soil Surveyor, June 1st.

J. Neufeld, B.S.A., Soil Analyst, July 22nd.

Miss C. L. Groves, B.H.E., Home Economist, August 1st.

K. W. Lee, Milk Board Inspector, September 1st.

Miss E. A. Whiteside, B.Sc., Bacteriologist, November 18th.

A. H. TURNER,
Deputy Minister of Agriculture.

AGRICULTURAL DEVELOPMENT AND EXTENSION BRANCH

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

EXTENSION ACTIVITIES

The expanding extension programmes of recent years continued in 1963, with increasing emphasis on farm management and the development of economic units.

Improved extension methods and techniques are being used to help rural people in their attempts to solve the many problems facing them in this rapidly changing world.

Increasing use is being made of specialists in developing effective programmes, and this applies to specialists in the British Columbia Department of Agriculture, Canada Department of Agriculture, the University of British Columbia, etc. This co-operative approach to extension is most encouraging.

LOWER MAINLAND AND VANCOUVER ISLAND

There was increased production in some commodities and a reduction in others. Milk production was down 5 per cent in the Fraser Valley for 1963 as compared with 1962, while production on Vancouver Island remained about the same.

Beef production continues to expand and has doubled on Vancouver Island in 10 years, with marked increases in the Fraser Valley during the past three years. Beef production continues to supplement dairy production. In many districts of this region there is ample evidence of activity in the rejuvenation of idle acreage and some marginal areas.

Accurate records are kept by our Extension staff on office callers and farm visits, and in this area (offices at Courtenay, Duncan, Cloverdale, Mission, Abbotsford, and Chilliwack) there were 8,380 office callers and the staff made 2,809 farm visits. The majority of office calls are for 4-H activities, with horticulture second.

PEACE RIVER, CENTRAL BRITISH COLUMBIA, AND CARIBOO

A number of staff changes were made in this area. Mr. R. C. Fry was transferred to Dawson Creek from Quesnel to assist with land-clearing and to take charge of radio and television programmes in the Peace River district. He is developing these very satisfactorily. Mr. John Piercy was transferred from Fort St. John to Prince George. The programmes in the Quesnel district are being supervised from Prince George and Williams Lake offices.

SOUTHERN INTERIOR AND KOOTENAY REGION

Emphasis was placed on extension activities in many areas of agricultural production in this region, including dairy, beef, field crops, forage crops, silage, and a heavy 4-H programme. An interesting new development in the Kamloops-North Okanagan area was the interest taken in grain-corn production by a commercial company in co-operation with our Extension staff. This has distinct possibilities.

REGIONAL CONFERENCES

Staff members attended conferences at Prince George in April and December, with specialists and senior officials from Victoria present.

SHORT COURSES

Staff members attended short courses at Kamloops and the University of British Columbia on beef production, sheep production, soils, etc.

LIVE STOCK

The 1963 story of the economics of beef-cattle production was one of up and down, and finally terminating in a price skid in the last three months of the year. In the United States it was just a case of too many cattle combined with higher average weights, resulting in increased supplies and lower prices. This picture, of course, was reflected in Canada as well. The cattle market began to deteriorate in late 1962 and continued to do so until March, 1963. In this period there was a drop of $6 per hundredweight; however, by September there was a recovery of $5 but a loss again of nearly $5 by the year-end. Fortunately for British Columbia, with an economy of feeder-cattle production, the market for replacement cattle to the feed-lots stayed strong and above the slaughter market from January through September and early October. The spread was about $2. A number of British Columbia cattlemen took advantage of this spread, but unfortunately the number not doing so was in excess, and finally they took a substantial cut in prices as well as a loss of pasture and feed. Those people close to the market in British Columbia feel that there has been a hold-back of cattle by the ranchers waiting out the market, consequently holding back calves to raise them into feeder yearlings and finally as fat cattle. There is some evidence that during the good grass years many of these yearling steers of good conformation could go for slaughter to make either of the two top grades and very desirable carcasses for the trade. There is a move on the part of the buyers for the slaughter trade to discourage the movement of grass-finished yearlings direct into these channels on the grounds that these cattle would not grade. The economics, however, are not always favourable for such a movement because of a premium paid for feeders.

Some live-stock people are guessing that cattle populations here in British Columbia, as elsewhere, are building up to an unprecedented high. Many heifer calves of the better kinds are moving at a slight premium into herds as breeders, and many older cows which should have moved to packers are still in ranch hands, where they will calve in the spring.

Cattle finishing in British Columbia on the basis of feed-lot finishing is still not making any progress. A few attempt it each year but soon become discouraged. Even in the Prairie Provinces where grain supplies are abundant and always cheaper, the margin of profit is often narrow. Grass finishing of beef cattle is British Columbia's only alternative, but more research on the subject is required to find new techniques in finishing yearlings on grass to a brandable grade. Under present "know-how" about one-third of yearling steers of good type and conformation will finish on good pasture alone, while the other two-thirds require 50 days in the feed-lot. Research could help here since grass is a natural and cheap product of British Columbia.

The British Columbia Livestock Co-operative Association is operating auction sales of commercial cattle at Kamloops, Williams Lake, Quesnel, Okanagan Falls, and Merritt. A new sale under the auspices of the Alberta community sales organization has been organized for the East Kootenay at Cranbrook, and this year held three sales with some success. There was a slight decline in the number of cattle handled by the sales in 1963, which follows in line with the hold-back predicted as a result of falling prices.

R.O.P. FOR BEEF CATTLE AND PROGENY TESTING

Six purebred herds of the three major beef breeds participated in the Provincial-Federal R.O.P. programme for beef cattle. One hundred and thirty-five head of calves completed the test; another 60 head completed the test to weaning but were sold or culled as calves before the end of the feed test. While some breeders have not been in agreement with the system of programme, lack of scale facilities have prevented others from participating. There has been on the whole a general impatience exhibited for fast results in order to facilitate sales. An R.O.P. committee to direct and set policy and to straighten out misunderstandings has been a dire need. Some of the herds on test are just now beginning to establish the identity of families of good producing cattle within their herds. The herd of commercial cattle on test was sold and is no longer on test. It was felt by the new owner to be too time-consuming. The Tranquille Farm has kept up testing and has made a substantial improvement so far through better management. Fertility has been improved to the point where a 95-per-cent pregnancy is possible. It has been possible to cull out poor-producing cows and to save only top replacements. Through artificial insemination it has been possible to identify replacements to both sire and dam for the major part of the herd. The use of the artificial insemination service from five sires at the Milner unit in 1962 and three sires for late fall breeding to produce late summer and early fall calves as a trial produced progeny with the highest average daily gain and superior conformation in all the data collected to date.

A progeny feeding test of 58 calves testing out five sires at the Milner unit is being undertaken at the Tranquille Farm in 1964. If carefully done, this test should provide final and very useful information.

SHEEP INDUSTRY

Lamb prices have been higher during 1963 than for several years. There were fewer feed-lot lambs on the market during the spring of this year and less dressed lamb imported in the early months of 1963. Because of improved prices, the statistics bear out that 45,000 United States fat lambs were imported into Canada between February 1 and August 1, 1963. This is a market which more Canadian sheep should have captured. Some drop in price was evidenced by the year's end.

Pastures, both on the farms and at the higher levels, showed marked improvement over 1962. The month of July was cool and wet, but temperatures were much higher than that of a year ago, when a blanket of snow covered all the alpine levels just as the sheep reached the high country. The " B.C. Alpine Lamb " slogan was again very popular in 1963 with the retail outlets, so much so that some outlets took advantage of its popularity by advertising outside lamb under its umbrella. Grizzly bear predations on bands were not at all serious in 1963, certainly not as in 1962. Only one band had a little difficulty, which led to the destruction of three bears. Wanton destruction of grizzlies, however, is not the answer to the problem and is not in the interests of better land use since there is room for both sheep and bear. Some research might be applied to design a method by which bear could be driven back into the more rugged areas where there is just as much natural feed for them as on the more accessible grassed areas.

AGRICULTURAL ENGINEERING DIVISION

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

The staff of the Division was basically unaltered during the year, and the policy as followed by the Division was similar to that in 1962.

Power and Machinery

Projects

1. *Committee to Study Fruit Handling Equipment.*—This group reported on the fruit damage in their 1962 committee report based on assessment work, and commenced assessment of wiper-polisher units in the 1963 harvesting season.

2. *Hay-drying.*—The Division co-operated with the Canada Department of Agriculture, the University of British Columbia, and the British Columbia Hydro and Power Authority on the assesment of a variety of hay-drying operations to establish basic recommendations for farmers wishing to carry out hay-drying.

3. *Tomato-sprayer Trials.*—Assessment of the drop-boom sprayer utilized for potato-spraying showed that this unit, with minor modifications to adjust it to row spacing used for tomatoes, indicates that it is successful for spraying this crop also.

4. *Strawberry-spraying.*—Minor assistance was provided in the preparation of sprayer units to be used in strawberry-spraying work.

Power and Machinery—General

One Tractor Maintenance Short Course was given in the Fraser Valley.

Publications include the Committee to Study Fruit Handling Equipment Activities Report and a publication dealing with pumps and conveyors for liquid-manure handling.

The extension work included four farm machinery field-days, seven meetings at which information on farm machinery was presented, and individual farm visits and consultation information to 22 individuals.

Soil and Water

Projects

1. *Irrigation Study.*—A combined survey study of irrigation systems utilized in forage-crop production in the North Okanagan indicates farmer interest in system expansion, and a definite need for system improvement if the best systems are to be provided.

2. *Tile-covering.*—A pump has been installed in the tile-covering project to permit assessment of the various tile coverings utilized.

3. *Drainage Coefficients.*—The physical plant is installed for this project, and some assessment should be possible during the coming winter.

In addition, some 46-mm. plastic tiles have been installed to compare its discharge with that of 4-inch tile.

Drainage

Drainage systems have been designed for 30 farms, totalling 1,234 acres.

Other extension work includes presentation of information on drainage at seven meetings, advisory service to 28 farmers, and the preparation of a plan for tile junction boxes.

Irrigation

Advisory assistance has been provided to 52 farmers regarding irrigation and water supply. Seven meetings were attended to present information on irrigation-

system design and the effective use of irrigation systems, and a bulletin, " Minimum Specifications for Design, Installation and Performance of Irrigation Systems," has been revised for local conditions and printed for distribution.

Soil Conservation

Reports have been prepared on four flooding and erosion-control problems, including Black Creek, Deadman River, Slocan River, and Squamish River.

Consultation assistance has been provided in 15 cases where domestic water is to be developed.

Following experimental work supported by the Department into improved filtering procedures for water in dugouts, the publication " Dugouts in Domestic Water Development " has been revised, incorporating a simplified filter system.

Farm Structures

Plan Service

In co-operation with the Canadian Farm Building Plan Service group, preliminary plans for the revised swine housing and equipment catalogue were reviewed. Final write-ups were prepared for a number of the plans in the fruit and vegetable storage catalogue, which has been forwarded to the printers and should be available in 1964. The revised dairy-cattle housing and equipment catalogues and plans have been distributed throughout the Province, and are available on request.

New Departmental plans prepared during the year include Pumphouse Plan for Farm Drainage, Foundations for Upright Silos, Hay Drying Duct System, and Damper Control for Vegetable Storage.

Plans distributed during 1963 include 528 Provincial plans and 3,943 Canadian farm building plans, for a total of 4,471 plans.

Building Standards

Active participation on the Canadian Farm Building Standards Committee, a sub-committee of the Associate Committee on the National Building Code, has included the preparation of material on sanitation as it affects structures. The first draft of this publication has been released for public criticism.

General

A publication on free stalls for loose housing has been adapted from a Washington State publication and is available for distribution in the Province.

Consultation service has been provided covering 40 queries on farm building and building layout.

Land Clearing and Development

From 1946 to March 31, 1963, work in the amount of $4,711,427.50 has been carried out for farmers on 8,448 accounts. The accounts receivable book balance at that date was $1,157,121.62.

Work completed to the above date included 120,217 acres cleared, 40,447 acres broken, 1,280 acres drained, 116 dugouts for domestic water, and other minor work consisting of road construction, fence-lines, and land-levelling.

Up to December 31st of the 1963 operating year, 13,343 acres were cleared and 11,491 acres broken. The expenditure during the year to the time stated was approximately $534,269.39.

The finalized figures for the fiscal year 1962/63 show 14,367 acres cleared and 8,147 acres broken.

During 1963 private contractors were utilized to carry out all work. Retendering was carried out in the following areas: Nanaimo, Courtenay, Abbotsford, Williams Lake, Princeton, Merritt, Quesnel, Prince George, Smithers, and North and South Peace River areas.

In all other areas existing contractors were reapproved when equipment inspection showed it to be satisfactory. Approval was granted to 80 contractors, who operated 104 crawler tractors, 7 scrapers, 12 mould-board plough breakers, 15 disk breakers, 26 backhoes, 21 draglines, 3 grade-alls, 3 wheel-type trenchers, 3 well-drilling rigs, 1 rock-picker, and 1 rotary mower.

The equipment of all contractors was reviewed at least once during the season.

Summary of Land Clearing and Development

District	1946 to Mar. 31, 1963 (Approximate Acres)		1962/63 Fiscal Year			
			Clearing		Breaking	
	Cleared	Broken	Number of Acres	Average Cost per Acre	Number of Acres	Average Cost per Acre
Peace River North	25,701	14,648	5,201	$16.00	3,148	$10.00
Peace River South	23,596	15,386	5,096	22.00	3,386	9.00
Prince George	11,479	7,314	479	33.00	314	8.00
McBride	3,027	2,333	227	38.00	333	9.00
Vanderhoof	6,647	2,917	647	20.00	417	8.00
Smithers	3,238	1,024	238	35.00	124	12.00
Terrace	500	200	.....	.....	.....	.....
Quesnel	5,176	3,264	376	34.00	264	7.00
Williams Lake	3,830	745	330	32.00	145	12.00
Kamloops area	9,546	500	496	55.00	.....	.....
Okanagan	8,481	(1)	481	48.00	(1)	.....
Kootenays	5,705	(1)	105	70.00	(1)	.....
Lower Mainland	7,307	(1)	507	105.00	(1)	.....
Pemberton	1,045	116	45	75.00	16	12.00
Vancouver Island	4,939	(1)	139	95.00	(1)	.....
Totals	120,217	48,447	14,367	.....	8,147	.....

1 Under " Broken " indicates that the methods used in clearing do not require the utilization of heavy breaking equipment for the clearing also, in effect, breaks the land.

The amount of work requested during the past operating season exceeded anticipated demands, and although an overrun of applications was approved, it is possible that not quite the total amount of funds made available will be expended.

4-H CLUB DIVISION

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

Enrolments

The first detailed analysis of club work in the Province was completed in 1963. The significant findings of this study revealed the following:—

Member Data

Number of clubs enrolled		219
Number of boys	1,478	
Number of girls	1,487	
Total members		2,965

Percentage of total over 15 years of age	28.3
Average age of B.C. 4-H member	13.6 years
Average tenure of membership	2.6 years
Percentage of members re-enrolled	66.5
Percentage of members that live on farms	71
Percentage of members from rural non-farms	21
Percentage of members from surburban area	8

Leadership data

Number of 4-H leaders	248
Number of assistant leaders	218
Total adult leaders	466
Total junior leaders	195

Project Data

Project	Clubs	Members	Per Cent of Total	Products
Beef	47	621	21.1	700 steers.
Community	21	338	11.0	In respective projects.
Dairy	53	822	27.2	1,034, 6 months to 3 years.
Garden and Potato	13	170	6.0	225 plots.
Goat	3	39	1.4	50, 1 to 3 years.
Grain	3	28	1.0	84 acres.
Home Arts	43	571	19.2	618 projects.
Honeybee	5	53	1.8	72 hives.
Poultry	7	68	2.3	2,050 birds.
Rabbits	3	32	1.3	53 does and litters.
Sheep	12	131	4.5	223, 1 to 3 years.
Swine	5	55	1.8	55 hogs.
Tractor	4	37	1.3	37 units.

In addition to the foregoing project work, it should be noted from the Leadership Data that 195 junior leadership projects were undertaken by the members. These particular projects provide effective experience in learning leadership techniques.

Club Activities

It was most encouraging to note the widening scope of 4-H activities organized at the local club level. Many of these happenings will be reported in detail by District Agriculturists. The section showing the greatest increase, however, involved district rallies. Twelve of these were staged in the Province and provided many new experiences in judging, identification, demonstrations, educational displays, and dress revue competitions. The benefits of bringing large numbers of 4-H members together for participation in wholesome competition is obvious. It adds a great deal of enthusiasm to the entire programme. It also serves the useful purpose of selecting district contestants for Provincial Competitions held at the Pacific National Exhibition.

Camping was reported on the increase by several districts. Visits to agricultural plants and other industries seem to occupy the interest of many clubs.

Public speaking is growing in popularity, with several districts reporting finalists now ready for the Provincial competition.

Provincial Club Week

The New Denver School dormitory facilities were again used for Provincial Club Week. A second year's experience made the task much easier. This is the most challenging undertaking of the entire year and requires a great deal of meticulous planning in advance.

Eighty-four delegates participated in the week-long programme, which presented the following topics: Advertising, Career Explorations, Application of Science, Community Service, The Image of 4-H, and a first-hand report on the situation in Korea.

Each member was required to satisfy staff examiners of his project knowledge, general knowledge, and leadership abilities. Ample opportunity for both the serious and recreational interests of the delegates is provided by Club Week.

At the conclusion of the week, the following delegates were chosen to represent British Columbia at the 1963 National Club Conference in Toronto and Ottawa:—

1. National delegates: Cheryl Moyer, Brentwood (Goat Project); Elizabeth Brooke, Pitt Meadows (Dairy Project); Nancy Miller, Sidney (Home Arts Project); Ralph McQueen, Dawson Creek (Beef Project); William Alendal, Sardis (Dairy Project); Alva Tudor, Barriere (Sheep Project); Mary Lord, Sidney (Home Arts Project); Frances Schmidt, Abbotsford (Home Arts Project); Jane Elderkin, Sardis (Home Arts Project); Wendy Baker, Victoria (Dairy Project); Wendy Fetherstonhaugh, Comox (Sheep Project); Jack Closkey, Port Kells (Dairy Project); Wendy Price, Cloverdale (Swine Project); Raymond Reimer, Sidney (Dairy Project).

2. 1964 delegate to National 4-H Club Conference in Washington, D.C.: Gwen Long, McBride (Beef Project).

3. 1963 recipient of Canadian National Exhibition Scholarship of $600: John Stanlake, Saanichton (Dairy Project).

4. British Columbia Fairs 50th anniversary scholarship of $300: Donna Hepburn, Chilliwack (Home Arts Project).

5. It was most gratifying to learn of the recent announcement by the Canadian Council on 4-H Clubs that the interprovincial exchange programme initiated in 1963 would be continued in 1964. Those delegates chosen at Provincial Club Week in anticipation of this announcement are as follows: Jean Blair, Langley, to visit New Brunswick; Jim Burbee, Dawson Creek, to visit Saskatchewan; Brian Baehr, Cloverdale, to visit Manitoba; Sharie Malisauskas, Port Kells, to visit Ontario; Leslie Cochran, Sardis, to visit Prince Edward Island; Karen Oland, Courtenay, to visit Quebec; Linda Vonarx, Courtenay, to visit Nova Scotia; Linnet Lannon, Sidney, to visit Newfoundland; Albert Hull, Langford, to visit Alberta. Each delegate will visit the host Province for approximately a two-week period. During this time the delegate will live with selected farm families and visit outstanding points of interest within the host Province.

1963 Interprovincial Exchange

In the 1962 Report the names of the British Columbia delegates to other Provinces are listed. This exchange, which embraced 90 4-H members throughout Canada, was termed an outstanding success. Nine members visited British Columbia, July 9th to 23rd, and gained many favourable impressions of our Province.

Their first five days were spent on a trip to New Denver to participate in Provincial Club Week. En route there they were hosted by the Vernon Chamber of Commerce. Following two days at New Denver, they were escorted to their respec-

tive farm homes. The host families were pre-selected by the District Agriculturists, resulting in a very successful visit by the guest 4-H member.

All participants, whether a British Columbia member visiting another Province or a guest in this Province, reported an enlightening experience.

Other Exchange Visits

Increased activity in this phase was noted during the year. Chosen to attend the State 4-H camp held at Pullman were Judi Reasbeck and Barbara Frost from South Peace River and David Bjornson and Irene Smith from North Peace River.

Ten members from the Dawson Creek and Fort St. John districts participated in Provincial Club Week programmes at Vermilion and Fairview, Alta.

Thirty-five 4-H members from the Armstrong district visited the Lethbridge area of Alberta for a week's duration and will, in return, host a bus-load of Albertans in 1964.

Two 4-H members in the East Kootenay received aid to attend Montana State 4-H camp.

Two 4-H members from the Creston district exchanged farm homes with two Idaho 4-H members.

Twenty-eight American 4-H members from Grays Harbour, Wash., spent a three-day week-end as the guests of the Saanich 4-H group.

Ten 4-H members from Eastern Washington visited the Bridesville-Keremeos district on a return-in-1964 basis.

In addition, there were several in-Province exchanges.

All of the above experience contributes much to widening the knowledge and experience of the participating member. Doubtless it presents new opportunities that would otherwise be denied many members.

Leadership Development

Ten regional Leaders' Workshops were held in the Province during February and March. Locations were as follows: Fort St. John, Vanderhoof, Armstrong, Cranbrook, Osoyoos, Kamloops, Salmon Arm, Langley, Abbotsford, and Nanaimo.

The workshops have been well received by the leaders, and their response is gratifying. We have found this to be an effective method of helping them with their problems of leadership as well as learning much about programme effect at the general membership level.

During the year, several " junior leader-senior member " conferences were held. These were organized by the District Agriculturists, with the 4-H Division supplying the programme. It was found that much of what we had taught the leaders in February had not reached the club member by May. Introducing our ideas at the intermediate level has proved to be an improved method of getting the message through to all levels of club work.

Early in the year a special plaque was presented to Mr. T. P. Wilson, of Vinsulla, upon the conclusion of 29 years of 4-H leadership. This practice will be continued for the benefit of several other leaders who have given so much to the development of young Canadians.

Summer Students

Over the past several years we have found it necessary to hire five summer students. These are selected from among senior Agriculture students at the University.

Their activities were primarily directed toward (1) project inspection, (2) 4-H visits to leaders, (3) 4-H rallies and field-days, and (4) special activities.

Material Preparation

Due to the diversity of projects being undertaken by members throughout the Province, there exists the continuing problem of supplying suitable study material. Beef and dairy manuals are presently under preparation by field staff. A new senior live-stock record-book was developed by the Supervisor. In addition, drafts were prepared on " How to Build an Educational Display " and on " Landscaping for Senior Members." Earlier in the year a new publication on demonstrations was completed and went into general distribution.

Four editions of the 4-H Newsletter were edited and assembled during the year. A mailing list of approximately 700 persons received copies of this publication.

Approximately 310 separate items are maintained for general distribution in support of the programme. These are chiefly bulletins, forms, and awards, which must be kept in adequate supply.

Home Arts Section

During the year a second Home Economist was employed to meet the demands of this rapidly growing phase of 4-H Club work. A new office was subsequently opened at Kamloops to provide more effective leadership to the Home Arts programme in the central and northern areas of the Province.

Both Extension Home Economists report a very busy season. Their most demanding activities were those associated with Home Arts Achievement Days, at which an evaluation of each 4-H member's project work is required.

Project evaluation: 34 achievement days attended, 425 members completed projects, 475 projects evaluated, 403 junior proficiency badges awarded, 30 members examined for senior status, and 52 senior skill certificates awarded.

Achievement days are held in all parts of the Province and require extensive travelling, frequently of nearly a month's duration.

As a result of hiring a second Home Economist, it became possible to proceed with special training in Home Arts projects for the benefit of the leaders. This was initiated in 1963 with outstanding success. Many of the most aggravating problems of the Home Arts leaders were thus alleviated. Training clinics were held at the following centres, with a fine turnout of leaders: Fort St. John, Prince George, Telkwa, Cranbrook, Vernon, Barriere, and Parksville.

In addition to the group approach used in the above areas, a personal visit was made to each Home Arts leader in the Fraser Valley. Close contact was also maintained with new clubs at Keremeos and at Parksville and Alberni.

Both Home Economists were required to participate in the 12 4-H rallies held in the Province. They were also essential to the successful programming of 4-H events at the Pacific National Exhibition.

During the year three new record-books were developed in addition to major revisions of existing project material.

Engagements to speak at Women's Institute conventions, 4-H parents' nights, University of British Columbia undergraduates, etc., were frequently accepted.

Programme Material Output of Division

Number of new stencils prepared	352
Number of rerun stencils	73
Number of orders received from district offices	243

Number of awards sent out		4,736
Agricultural Projects	pieces	11,717
Home Arts Projects	pieces	7,725
Supplementary to projects	pieces	2,243
Special activities	pieces	2,959

NOTE.—" Pieces " refers to a booklet consisting of several pages.

APIARY BRANCH

J. CORNER, PROVINCIAL APIARIST

During the summer of 1963 a total of 24,300 colonies of bees produced a colony average of 75 pounds of surplus honey. This resulted in a total crop of 1,839,415 pounds. Colonies throughout the southern half of the Province averaged only 50 pounds, resulting in a much lower total crop than expected. The trend toward fewer beekeepers operating more colonies efficiently is continuing and is to be desired. A world shortage of honey and increased export markets for Canadian honey in retail packs is encouraging increased production.

BEE DISEASES

Adequate inspection together with intelligent use of antibiotics and drugs have reduced the incidence of American foul brood (*bacillus larvæ*) in live colonies to its lowest point in many years. European foul brood was not a serious problem in the British Columbia Peace River area. Outbreaks of this disease were severe in the Lower Mainland area, but were quickly brought under control by the use of terramycin (TM 25).

A disease of adult bees showing symptoms of paralysis has been observed in Vancouver, Queensborough, and Victoria areas. Samples were collected and submitted for microscopic analyses. Nosema disease was in evidence in the humid regions of the Fraser Valley and Vancouver Island, with normal outbreaks throughout the remainder of the Province.

Number of beekeepers	2,010
Number of colonies	24,300
Number of colonies inspected (does not include revisits)	7,005
American foul brood (colonies affected and burned)	89
Percentage of colonies affected	1.3

POLLINATION

Apiary, Entomology, Horticultural, and Field Crop Branches continued to cooperate on extension work in pollination of blueberries, tree fruits, small fruits, and legumes.

In the Peace River area, 90 bumblebee domiciles were set out. Of these, 37 per cent were occupied. The accepted domiciles were moved to close proximity of alfalfa-seed fields for pollination purposes.

Forty-five colonies of honeybees were used to pollinate a 30-acre block of tetraploid alsike clover at Mile 24 on the Alaska Highway. In spite of extremely dry conditions, 200 pounds of clean seed per acre were harvested.

Twelve soil cores containing larvæ of the alkali bee (*Nomia melanderi*) were obtained from Oregon and introduced into the Ashcroft area. This trial project was entirely successful. Two acres of foundation Vernal alfalfa are already seeded for next year's work, and 5 acres are to be seeded next spring. Thirty cartons of the leaf-cutter bee (*Megachile rotundata*) are now held at Vernon, and work will be carried out to determine the value of this pollinator under British Columbia conditions. Work is to continue on these projects.

In the Lower Mainland area an average of 4,698 pounds of blueberries per acre was harvested from plantations where honeybees were used. This compares with 2,604 pounds per acre where no honeybees were used. Analysis of pollen trapped at hive entrances showed 96 per cent blueberry, 2 per cent dandelion, and 2 per cent unidentified.

On red clover fields in the Ladner area, colonies of honeybees were interspersed through the fields. Seed yields averaged 600 pounds per acre. In world seed competition, first and second prizes were awarded to seed harvested from these fields.

A total of 775 colonies was hired for pollination work at a cost of $5,037.50, an average of $6.50 per colony.

PACKAGE BEES

Fifty packages of bees were shaken from colonies in the Fraser Valley near Haney and installed in the Fort St. John area. An average of 150 pounds of honey was gathered by these colonies. This work has shown that the production of package bees in British Columbia is feasible. Beekeepers in the Fraser Valley area have now formed a package-bee co-operative to guarantee continued supply and quality.

WINTERING

Increased interest is being shown in over-wintering of colonies in British Columbia. Shaking packages and making division from these colonies are the main reasons for this.

PUBLICATIONS

Three issues of " Bee Wise " were written. Four newsletters were also written and distributed. Mimeographs on all phases of beekeeping were prepared and distributed.

EXTENSION

Emphasis is being placed on extension work. This has resulted in a reduction of regulatory problems.

Short courses on beekeeping were held at Langley, Penticton, Fort St. John, and Quesnel, and an exhibit on honey production and blueberry pollination was set up at the Pacific National Exhibition in co-operation with the blueberry co-operative.

Our 16-mm. film, " Diseases and Pests of the Honeybee in British Columbia," will be completed this coming year. Many 35-mm. slides on all phases of beekeeping were prepared and filed.

Attended by members of our staff were 27 field-days, including two international and one interprovincial, the latter at Beaverlodge, Alta., and 40 meetings of various groups, including the Canadian Beekeepers Council and the Canadian Association of Apiculturists.

DAIRY BRANCH

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

PRODUCTION

		1962	1963 (Estimated)
Milk	lb.	904,885,000	881,000,000
Manufactured products—			
Butter (creamery)	,,	7,215,000	5,021,586
Cheese (Cheddar)	,,	979,000	990,627
Cheese (cottage)	,,	6,471,000	6,600,000
Ice-cream	gal.	4,796,000	5,076,000
Evaporated milk	lb.	52,023,696	56,962,212
Milk powder	,,	9,298,159	2,465,952

UTILIZATION

		1962	1963 (Estimated)
Used in manufacture	lb.	347,312,000	312,020,000
Used in fluid form—			
Fluid sales	,,	487,494,000	506,480,000
Farm-home consumed	,,	37,219,000	30,000,000
Fed to live stock	,,	32,860,000	32,500,000

UTILIZATION OF MILK AS PERCENTAGE OF TOTAL PRODUCTION, 1962

	Canada	British Columbia
Creamery butter	43	15
Cheese	8	2
Concentrated milk	5	14
Fluid sales	30	52
Ice-cream	4	9
Used on farms and other purposes	10	8

MARKETING

Consumption figures for nearly all classes of dairy products showed essentially the same trend in 1963 as in 1962. Fluid sales of milk and cream have not kept pace with population increases or with accepted indices of increased standards of living. Butter consumption has again increased *per capita,* with the significant price reduction instituted in 1962 having a full year's effect on consumption patterns.

Milk Board action to peg the differential between manufacturing-milk prices and fluid-milk prices served to reduce production, particularly in the first half of 1963. The resultant increase in fluid utilization with attendant price increases to the producer brought milk production by year's end to approximately that of 1962.

The average farm value for all sales of milk in 1963 in British Columbia is estimated to exceed $4.40 per hundredweight, as compared to $3.47 for Canada as a whole.

DAIRY PLANTS

There were 68 dairy-plant licences issued in 1963. During the licence-year (April 1, 1963, to April 1, 1964) one dairy plant ceased operation. Of the total number of dairy plants operating as of December 31, 1963 (67), 53 are pasteurizing milk, 22 are making ice-cream, 14 are making cottage cheese, 11 are making butter,

5 are making cheese other than cottage, 1 is making evaporated milk, and 1 is making powdered milk, several of the aforementioned plants being multi- or dual-product operations.

Licences

Dairy-plant licences issued in 1963 numbered 68, and dairy-plant personnel comprised the following:—

	Permanent	Temporary
Milk-tester	64	8
Milk-receiver	12	27
Tank-milk receiver	79	12
Cream-grader	12	6
Butter-maker	6	8
Cheese-maker	1	10
Ice-cream maker	2	7
Pasteurizer operator, Class 1	41	12
Pasteurizer operator, Class 2	36	12
Dairy-product analyst	8	2

Manufacturers of oleomargarine numbered 4, and there were 24 wholesalers.

Permits

	Issued 1963
Reconstitution of milk	2
Tank-truck	30
Farm holding-tank	335

MILK-GRADING

The research which was started in 1962 into milk-grading continued throughout 1963. Changes in regulations were introduced, effective February, 1963, and were based on the Milk Grading Committee's recommendations which led to changes in frequency of sampling, period of suspension, etc. The net result was a very significant improvement in the quality of raw milk entering the fluid market, although the test used to grade the milk remained the same (Resazurin). Bacterial counts were made on a milk sample from each producer each month, and the results were supplied to him to guide him in proper production procedures in preparation for the anticipated changes in grading regulations in 1964.

Because of the changes in methods of suspension for shipment of poor-quality milk and because the frequency of sampling was changed, 1963 milk-grading results cannot be directly compared with previous years.

Milk-grading results from February to December, 1963, were as follows: Number of samples, 26,686; number of samples below standard, 1,987; number of producers suspended, 441. These figures should be considered in the light of the three previous years' average, when over 2,700 producers were suspended annually, with over 12,000 samples grading below standard each year.

DAIRY SHORT COURSE

Interest in the annual dairy short course remained high in 1963, with 14 students completing the correspondence and residence portions of the course.

DAIRY BRANCH LABORATORY

In 1962, through a grant to the University of British Columbia, a milk-grading research laboratory was established on the University campus. Throughout most of 1962 and all of 1963, this laboratory conducted research work on milk samples

submitted from each milk-producer in the Province at least once monthly. This research has led to establishment of new milk-grading regulations which should be promulgated in the near future, and which envision the continued use of a central government laboratory to analyse samples of producers' milk for the majority of the dairy plants in the Province on a fee basis.

In October, 1963, the responsibility for sampling, bacterial analysis, reporting, and determination of compliance with regulatory standards on samples of pasteurized milk and cream from all dairy plants in British Columbia was transferred from the Department of Health to the Dairy Branch, Department of Agriculture.

Plans have been drawn and tenders let for an early start on construction of expanded Dairy Branch laboratory facilities at Cassiar Street, Vancouver, which will replace present inadequate rented facilities at the University of British Columbia, and which will allow for the proper future operation of the greatly expanded Dairy Branch laboratory.

Summary of analyses performed in 1963 at the University of British Columbia Dairy Branch laboratory is as follows:—

Analysis	Number of Samples
Phosphatase	903
Coliform count	1,806
Standard plate count	975
Resazurin	3,415
Loop plate count	7,983

PERSONNEL

In April, 1963, Mr. Herbert Riehl was appointed as Dairy Inspector to fill the vacancy existing in the Prince George area. Mr. Riehl, in addition to his regular Dairy Branch duties, is also responsible for all dairy-farm inspection in this area, which includes Quesnel, Prince George, Vanderhoof, McBride, Smithers, Kitimat, Dawson Creek, and Fort St. John.

LEGISLATION

In January, 1963, the regulations under the *Milk Industry Act* were extensively amended. Among the more significant amendments were: (*a*) Changes in milk grading; (*b*) compulsory licensing of dairy-plant personnel engaged in the receiving, testing, grading, processing, and manufacture of dairy products; (*c*) new standards of time and temperature required for pasteurization of dairy products; (*d*) amalgamation of regulatory authority in the Department of Agriculture; and (*e*) revision of requirements relative to dairy-farm and dairy-plant premises.

Amendments to the *Milk Industry Act* were assented to in 1963 relative to the Dairy Producers Protection Fund, advertising fund, and Milk Board matters. Additional amendments are proposed for the 1964 legislative session to deal with the final transfer of responsibilities from Health to Agriculture, and regulations related to these amendments and other matters are to be promulgated shortly.

DAIRY BRANCH OPERATION

Over the past two years the role of the Dairy Branch and the duties of its staff have changed greatly. The area responsibilities of the Dairy Inspectors have remained much the same; however, the duties within the area have been enlarged and changed. Each Inspector has a responsibility for the total control of the dairy industry within his area. Additional duties in this comprehensive control which

have been added to his role in 1963 are: (*a*) Sampling of fluid-milk producers monthly; (*b*) authority to inspect raw-milk and fluid-milk dairy-farms; (*c*) examination and licensing of dairy-plant personnel; and (*d*) sampling of pasteurized milk and cream from all dairy plants and raw-milk producer-vendors monthly. The imposition of these added responsibilities adds appreciably to the work load of Dairy Branch staff; however, the service which can now be offered (from producer to processor to consumer), because of its comprehensive nature, is so much more meaningful that intelligent co-operative programmes can be evolved, to the betterment of the industry as a whole.

SUMMARY OF DAIRY BRANCH SERVICES, 1963

Number of inspections and visits—	
Dairy plants	720
Dairy-farms	1,040
Butterfat tests—	
Producer	1,271
Finished product	290
Laboratory analyses—	
U.B.C. central laboratory	15,082
Area laboratories	5,471
Examinations—Dairy-plant personnnel	85
Oleomargarine—	
Labelling checks	92
Composition checks	43
Farm holding-tanks—	
Certified	335
Miscellaneous checks	86
Grading (sensory)—	
Milk	2,626
Cream	90
Other dairy products	146
Milk and cream samples collected—	
Raw-milk producer-vendors	72
Fluid-milk producers	7,983
Pasteurized products	903
Meetings attended	85

SUMMARY AND OUTLOOK

The 1963 total farm cash value of all milk produced in British Columbia exceeded $40,000,000, and a moderate increase is envisioned in 1964. Milk production decreased in 1963 by about 2 per cent, but with production holding firm in the last quarter of 1963 and with the expansion of Milk Board control (with added stability) to the Kootenay and Central British Columbia areas effective January 1, 1964, milk production is expected to increase slightly in 1964 to about 900,000,000 pounds. The majority of this increase will likely go into fluid sales, with no significant increases in the production of manufactured dairy products.

It is likely that the trend toward reduction of the number of smaller dairy plants and dairy-farms which has taken place over the past few years (with a temporary hiatus being reached in 1963) will continue in 1964. The need for maximizing the economies of large-scale production with increased use of labour-saving equipment

and machinery both on the farm and in the dairy plant must be recognized to eliminate intolerable pressures of the cost-price squeeze.

The quality of milk and milk products as they enter the processing cycle and as they are offered to the consumer continued to improve in 1963, and with comprehensive inspectional and instructional programmes being developed within the Dairy Branch, quality should continue to improve in the future.

The full impact of the programmes implemented in 1963 and those which are envisioned for 1964 after regulatory and administrative changes, coupled with maximum use of expanded laboratory facilities, and a gradual development of "total concept" planning lends credence to the belief that the future of the dairy industry in British Columbia should be viewed with optimism.

DYKING AND DRAINAGE DISTRICTS

W. R. MEIGHEN, P.ENG., INSPECTOR OF DYKES AND DYKING COMMISSIONER

In so far as the Province's 40-odd dyking districts were concerned, very normal weather prevailed during the past year. No extreme storm or run-off conditions occurred to cause major flooding in any district. Peak flows in streams remained well below record or even average levels and presented no flood threat. Peak reading on the Mission gauge during the Fraser River freshet was 16.17 feet, which was well below average and the lowest peak reading since 1944. Peak readings on other streams were similarly low.

All districts therefore enjoyed a relatively quiet and uneventful year. They carried out adequate maintenance to their works and made improvements to these works where possible. Several districts made good use of the Federal-Provincial Winter Works Incentive Programme to make improvements in their drainage systems.

The several districts which have annually been combating river erosion on a cost-sharing basis with the Provincial and Federal Governments continued these projects in the past year. The total estimated amount to be spent on 11 projects was $220,000 in 1963.

ENTOMOLOGY BRANCH

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

There were no major insect outbreaks during 1963. There was increased evidence of resistance to insecticides by mites on tree fruits, pear psylla, carrot rust fly, and cabbage maggot. The problem of pesticide residues received an increasing amount of attention and investigation.

FIELD-CROP, FORAGE, AND VEGETABLE INSECTS

There was an increase in grasshopper populations in the Princeton-Kamloops areas. Hydrocarbons failed to control turnip maggot in several areas, especially in the Courtenay area, where some crops were not marketable, and no control is available for 1964. Chemical control of the clover weevil on white Dutch clover near Creston proved very effective, with yields averaging 600 pounds per acre. Cutworm populations were normal, as was tuber flea beetle. It appears that initial attempts to

establish the bees *Nomia melanderi* and *Megachile rotundata* from Oregon to Ashcroft as a means of increasing alfalfa-seed production have been successful.

ORCHARD INSECTS

The major part of the summer work in the Interior was devoted to the Federal-Provincial project "Application of Integrated Spraying in British Columbia Orchards." In summary, this project, while useful in many ways, was not able to accomplish its basic purpose of reducing the required number of sprays in a given orchard. It will not be continued until answers to some of the more basic entomological data become available, and these can only be made available by extensive research. San Jose scale investigations have led to new information *re* its life-history and control methods. Continued publicity by Apiary-Entomology-Horticulture has resulted in increased use of honeybees for fruit-tree pollination and increased production.

SMALL-FRUIT INSECTS

Grape phylloxera was not found during 1963 after our attempts to eradicate an introduced infestation during 1961/62. The bush weevil *Nemocestes incompetus* severely damaged 1 acre of Puyallup raspberries at Abbotsford, and the black vine weevil *B. sulcatus* killed 3-year-old blueberry bushes on peat soil at Pitt meadows. The leaf roller *Dasystoma salicellum* caused considerable damage to blueberries on Lulu Island and Pitt meadows. Cyclamen mite, root weevil, aphids, and mites were normal on strawberries.

LIVE-STOCK INSECTS

Warble fly continues to be one of the major pests of cattle. Increased use of systemic insecticides took place, but producers are still not giving the problem the attention it needs. Populations seem to be increasing in Coastal areas, particularly in dairy animals, where little control has been done during the last few years. Lice also continue as a major pest.

Mosquito problems were not as numerous this year as in many years. Run-off in the major river systems caused little flooding, hence fewer mosquitoes. A survey of breeding areas was conducted during June-August in the Chilliwack municipality.

OTHER INSECTS

Requests for identification and control of insects were numerous, with over 550 being made at Victoria. Household and back-yard gardener problems are frequent. Fleas about the home seemed unusually abundant in 1963, judging from inquiries. Further tests were conducted jointly with Forest Biology (Vernon) on control of Douglas fir needle midges at Invermere and Edgewater.

PESTICIDE PROBLEMS

Considerable time, over and above that normally needed, has been spent in respect to pesticide residue problems. This has involved participation on one National and two Provincial committees. It has also involved a survey of pesticides used in the dairy industry, and from this a programme of education for the dairy industry, dairymen, and our own staff.

FARMERS' INSTITUTES

L. W. JOHNSON, SUPERINTENDENT

Seventeen of the 133 Farmers' Institutes in the Province failed to file annual returns for the year 1962. The 116 active Institutes showed a total membership of 4,689. Purchase of commodities on behalf of members continues to increase, the total value being $1,593,757.

DISTRICT INSTITUTES

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

District	Place	Date
District "A"—Vancouver Island and Gulf Islands	Nanaimo	September 28.
District " B "—Skeena-Bulkley	Terrace	June 24 and 25.
District " C "—Central British Columbia	Vanderhoof	June 20 and 21.
District " D "—Kamloops-North Thompson		
District " E "—Lower Fraser Valley	New Westminster	March 29.
District " F "—West Kootenay	Nelson	June 1 (semi-annual).
District " G "—Okanagan-Shuswap	Grindrod	June 5.
District " H "—Cariboo	Williams Lake	June 15.
District " I "—East Kootenay	Cranbrook	May 30.
District "J "—Peace River	Golata Creek	June 27.

ADVISORY BOARD OF FARMERS' INSTITUTES

The 46th annual meeting of the Advisory Board of Farmers' Institutes was held in Victoria on December 3rd, 4th, and 5th, at which time 50 resolutions submitted by the District Institutes were considered. Thirty-five were approved, eight withdrawn, and seven defeated. A brief dealing with such matters as land-clearing, tractor-maintenance courses, weed-spraying, farm loans, rural electrification, road maintenance, game laws, surveying of Crown lands, Provincial medicare scheme, licence fees for farm vehicles, use of purple gasoline in farm vehicles, school taxes, soil-testing, crop insurance, and liability insurance was presented to the Provincial Cabinet for their consideration.

EXHIBITIONS AND FALL FAIRS

During the year 1 Class A exhibition, 8 Class B exhibitions, 11 Class C exhibitions, and 40 fall fairs recognized by the Department were held throughout the Province. In November of this year the Lower Fraser Valley Exhibition, having complied with the Federal Exhibition Grants Regulations and on recommendation of the Provincial Department, was granted Class A status.

POUND DISTRICTS

Pound districts constituted in unorganized territory during the year were as follows: Siphon Creek, February 19th; Salmo–Ymir Road, March 25th; Hupel-Kingfisher, April 11th; Deer Park, June 21st; Spillimacheen, October 8th; and Umbach Creek, December 6th.

The boundaries of the Beaver Creek Pound District, Rolla Pound District, and Red Bluff Pound District were extended.

MISCELLANEOUS

Fence-viewers were appointed for the unorganized territory in the Rossland-Trail, Salmon Arm, and Grand Forks-Greenwood Electoral Districts. An amendment to the *Line Fences Act* permits the Minister of Agriculture to appoint fence-viewers in place of the Lieutenant-Governor in Council, and ensures that owners of adjoining lands shall each pay half the costs of making and repairing the fence which marks the boundary between them. Seven Grasshopper-control Committees received advances for the purpose of exterminating and controlling grasshoppers in their respective areas, and 108 licences to sell poisons used exclusively in agriculture were issued.

FIELD CROPS BRANCH

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

CROP PRODUCTION

CEREALS

Although there was an increase in acreage seeded to wheat, oats, and barley in the Peace River District this year, yields per acre were below average, so that total grain production was down. The increase in seeded acreage resulted from the development of new areas as well as the diversion of some forage-seed crop acreage to cereal production. An open fall with prolonged good harvest weather enabled farmers to take off a good-quality crop in this area. Flax acreage was down sharply, and yields were light. The Central Interior, North Okanagan, and Creston districts harvested normal yields of grain. There was a good oat crop in the Fraser Valley. Again this past year there has been a heavy movement of grain from the Peace River to be used as feed in the southern parts of the Province, and prices remained firm.

HAY AND PASTURE

A late spring delayed forage-crop growth in most areas of the Province this year. However, above-average summer rainfall brought pasture crops on, particularly at the Coast, and provided adequate forage throughout the growing season. Above-average hay crops were reported in most areas, but inclement weather at the Coast and in the Okanagan did hinder curing of top-quality feed. Two areas—one in the South Peace River and one in the Central Interior around Burns Lake—experienced a very dry season, and the live-stock producers are going into the winter with inadequate supplies of winter forage.

SEED PRODUCTION

During the past two seasons there has been considerable acreage of forage-crop seeds in the Peace River ploughed up and converted to grain production. In addition, the dry spring in the area reduced seed yields, so that total volume of seed has declined in the past two years, although 1963 production exceeded that of 1962. In the Central Interior most of the timothy-alsike fields were cut for hay, and little seed was produced in that district. Seed prices, however, have increased. The double-cut clover-seed crop in the Fraser Valley was better than average this year. The small acreage of turnip and sugar-beet seeds grown in the area also yielded well.

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

Crop	Acres	Crop	Acres
Wheat	650	Barley	1,100
Oats	367	Flax	68

Estimated yields of commercial forage-crop seeds for 1963, together with the final production figures for 1962, are shown in Appendix No. 7.

The annual seed fair was held on February 20th this year at Fort St. John.

Potatoes

Commercial potato acreage remained about the same, at 10,700 acres, this year. Average yields and general quality in the main growing areas were good. Although not general, some difficulty was experienced on several farms in the Fraser Valley this year with a hollow heart condition in the Netted Gem variety. This variety still remains the most popular commercial potato on the market. Prices this year have remained firmer than a year ago.

Acreage in certified seed potatoes declined slightly this year.

The main areas of seed production with acres inspected in 1963 are as follows (1962 acreages in parentheses): Pemberton, 144 (261); Vancouver Island, 284 (337); Lower Mainland, 140 (115); Okanagan, 112 (142); Cariboo, 200 (200); Central British Columbia, 26 (26); Boundary District, 300 (93); Kootenays, 236 (332).

As a service to the seed-growing potato industry, we again supervised the planting of seed-potato samples in the greenhouses at the University of British Columbia and the Experimental Farm, Saanichton, this fall. Disease readings are now completed on 47 samples.

Field Peas

Acreage in field peas is down this year, particularly in the Creston area. The yields have remained about average.

BRITISH COLUMBIA CROP IMPROVEMENT ASSOCIATION

No samples of seed were distributed to farmers in 1963 for commercial testing. However, foundation seed of La Salle red clover, New Zealand white clover, Rambler alfalfa, Beaver alfalfa, Vernal alfalfa, and Hercules orchardgrass was distributed to seed-growers for production. A non-licensed variety of fall wheat from Washington State, designated Gaines, was also imported for trial.

DEMONSTRATIONS AND TRIALS

Demonstration trial plots, including cereal varieties, forage crops, potatoes, weedicides, soil fertility, fertilizers, and potato vine killing, have again been established in many areas of the Province this year. Many of these trials continue over several years to assess results. Where possible these are continued in co-operation with the Research Branch of the Canada Department of Agriculture and the University of British Columbia.

A soils extension programme started last year was continued, and in addition to the Soils Club at Duncan, 10 new clubs were formed in the Okanagan.

SOIL AND FORAGE ANALYSES

The laboratory work has continued to increase again this year, and we have now completed renovation of our laboratory with improved facilities and space, and plan major changes in our testing procedures during the coming year. The following table indicates work of the laboratory this year:—

Materials Tested	Determinations of Analysis	Number of Samples
Soils	Nitrates, phosphorus, potash, calcium, and pH	4,296
Water	pH and conductivity	300
Feeds and forage	Crude protein, moisture, pH (on silage only)	256

AGRICULTURAL LIME

For the 12-month period ended December 31, 1963, 43,261 tons were distributed under the Federal-Provincial Lime Subsidy Policy.

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
1958/59	1,288	$107,749.24	36,529.09
1959/60	1,326	118,989.76	41,298.81
1960/61	1,328	117,110.26	39,835.68
1961/62	1,436	129,212.85	43,505.20
1962/63	1,275	110,321.60	37,118.24

FERTILIZER AND AGRICULTURAL POISONS BOARD

The Board did not hold a meeting this year, and the following mixes continue as approved recommendations: 2–15–15, 4–10–10, 6–8–6 (organic), 6–30–15, 8–10–6, 10–20–10, 10–30–10, and 13–16–10.

WEED CONTROL

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

We have continued to test and demonstrate the use of newer herbicides for weed control in waste areas, as well as in agricultural crops. There continues to be an increased acceptance of chemical heribicides for weed control in all farm operations, and particularly on fruit and horticultural crops. The weed-control chart for the Province is under revision this year to incorporate most recent recommendations.

The Western Section of the National Weed Committee held its annual meeting in Vancouver this fall.

The Department of Highways has continued its spray programme on roadside weeds, with about the same mileage included this year as last. Other agencies, such as the railways and hydro-power organizations, have also increased the use of herbicides to control vegetation along roadways and power-line rights-of-way.

TORONTO ROYAL WINTER FAIR

There was a good entry of red clover seed samples from growers in the Fraser Valley this year exhibited at the Toronto Royal Winter Fair, and all samples placed well in the class. Mr. Beharrel's sample placed first and Mr. Huff's second, and these two samples went on to win the world championship and world reserve championship in the forage-seed section.

GRAIN SCREENINGS

During the year 16 permits for removal of screenings were issued to elevators and merchants. In addition, 44 feeders' permits were issued.

Nine processing plants are licensed to devitalize screenings. In all cases the grinding and steam pressure as prescribed have given excellent devitalization of weed seeds. Most of the refuse screenings used in British Columbia are now being devitalized and pelleted. In spite of a heavy movement of grain through the Pacific terminals with a heavy cleanout of screenings, demand and price have remained high.

HORTICULTURAL BRANCH

A. C. Carter, B.S.A., Provincial Horticulturist

The number of farms having horticultural enterprises continues to decrease but the work of the Horticultural Branch increases annually. Farm units are larger, and their managers wish to take advantage of the technological developments available to them more than ever before. District Horticulturists in this field appreciate the opportunities they have had to associate with and learn from those engaged in local, national, and occasionally international research. It is apparent that there will be an even greater need to provide opportunities to study and understand the technology of the future if we are to retain our present crops in a healthy competitive position and develop new ones. This report gives a brief summary of crops and projects the Horticultural Branch has been working with during the past year.

The yields and returns from horticultural crops have generally been favourable to the grower. Early in the year there was concern because of unfavourable weather. Frosts killed buds on stone fruits; the spring and early summer was unusually cool and wet, but warm clear days followed and brought crops to optimum maturity. Harvest conditions were ideal and labour needs were met.

In spite of the favourable year, growers are finding that the margin of profit per acre is decreasing, and this is forcing some small units to increase in size or sell to others prepared to handle larger operations. The following brief summary by regions gives the general picture as seen by horticulturists throughout the Province.

On Vancouver Island, greenhouse operators close to Victoria are being forced by urban development to locate farther out in Saanich, and some are considering moving to the Mainland, where they would be closer to the markets for their produce. Small-fruit land is in strong demand, and the price per acre reflects the health of the industry. Vegetable-growers are increasing their production north of the Malahat. The Gulf Islands and favourable areas west of Victoria are expected to plant larger acreages of small fruits and vegetables.

The Lower Mainland has increased production of horticultural crops. Fruit-processors are unable to get sufficient raw product, and there is a marked trend to vertical integration. Four of the largest processors now have large farming operations under their direct control. So far the increase in integrated operations has not resulted in a subsequent cut-back of contracted acreage, but has only been used to supply the increasing demand for raw material required by expanding operations. Processors have stated that they have difficulty locating growers willing and able to operate larger acreages of crops. Raspberry and strawberry farms are getting larger, with more than a dozen growers cropping at least 25 acres each. An assured source of harvest labour or greater mechanization will facilitate rapid expansion in many crops.

In the Okanagan Valley most districts engaged in the production of horticultural crops appear prosperous. All report a fairly steady turnover of orchards. One

district reports an increase in orchard prices of 10 per cent, and this is the trend throughout the tree-fruit area. A number of successful growers are adding to their holdings, using improved credit facilities. Farm units are getting larger, although two large orchards have been subdivided during the year—Bankheard Orchards at Kelowna and Kaleden Orchards near Penticton. The *Agricultural Rehabilitation and Development Act* is expected to open up new land which newcomers would like to develop in grapes because orchardists show very little interest in changing to this crop at present.

There is a gradual erosion of orchard land near the towns for residential areas, light industry, and recreational purposes. This does not mean that the tree-fruit production will decline. Unless winter losses take place, it will increase. The 1963 apple and pear crop demonstrated the capacity of the area to come back with record and near-record production. Many young apple, pear, and cherry trees have not yet produced, and many more trees which started to bear this year will increase production in the next decade to unprecedented levels.

In Creston Valley the decline in orchard acreage continues, but the yields per acre are expected to increase and maintain production. Potato and seed-pea acreage could expand on the flats, but a more intensive cropping programme, such as is required for horticultural crops, is not expected to develop in the immediate future.

SMALL FRUITS

All of the principal small-fruit crops increased in total production in the Province in 1963. Favourable growing conditions gave maximum yields on all crops except strawberries. The most marked increase was in cranberries. Significant increases were also recorded in blueberries, loganberries, and raspberries. With a favourable winter, these crops are expected to increase in volume in 1964 as new plants mature and cultural practices improve. Appendix No. 8 shows the final production estimate for 1962 and an estimate of 1963. Appendix No. 10 is a summary of the most recent small-fruit acreage survey.

STRAWBERRIES

Production did not increase in this crop as it did in other small fruits. Strawberry plantings throughout the Province suffered some frost damage in January. The extent of the damage varied with the variety and the age of the planting; Northwest suffered more injury than the Siletz and British Sovereign varieties. Older plantings, particularly those grown in the hill system, produced only a fraction of their potential crop.

Spring growth on plantings was normal, with full bloom occurring at the Coast during the third week of May. The high temperatures through May greatly accelerated the ripening period, with the result that picking started some two weeks earlier than 1962.

Because school students were not generally available, an acute labour shortage existed for the first week of harvest, especially on the Lower Mainland. An extensive publicity campaign conducted by the Farm Labour Service, in co-operation with the officials of the National Employment Service, alleviated the situation. No particular harvest problems were encountered for the remainder of the season.

Strawberry planting not protected by the recommended spray programme developed fruit rot, and losses in the order of 25 per cent were reported near Abbotsford.

Raspberries

Raspberry plantings on the Lower Mainland made succulent growth in 1962 and were still actively growing in October when the area was hit by typhoon winds. The wind damaged the leaves and prevented the normal maturing process from taking place. Low temperatures in January further aggravated the condition, with the result that the majority of plantings inn the Abbotsford area had 25 per cent of their top buds impaired. Crop prospects looked discouraging, but the cool moist weather in June and July permitted the weakened canes to mature a maximum crop. Furthermore, first crop plantings produced the highest yields on record. The 1963 raspberry crop at 5,813 tons was 40 per cent higher than 1962 crop and the highest for the area since 1957.

A survey on the Coast, completed in January, 1963, indicated a total of 1,455 acres, grown almost exclusively in the Fraser Valley. The Willamette is now the leading variety, followed by Newburgh.

Loganberries

The loganberry crop was up 41 per cent over 1962 and 61 per cent over the 10-year average. On the other hand, acreage is lower than at any time in the past 10 years. The demand for this crop continues to exceed the supply largely because of sales to the wine industry.

Blueberries

The total blueberry production for 1963 was approximately 49 per cent greater than in 1962. This remarkable increase may be attributed to new plantings, ideal weather conditions for the development of the crop, and a fine, dry fall that permitted a complete harvest. With the co-operation of the Apiculture Branch, numerous blueberry-growers made use of bees for the purpose of pollinating the blueberries. Although accurate records are not available to date, it is felt that the presence of strong hives of bees increases the set of this crop.

Cranberries

The cranberry industry produced a record crop of 801,000 pounds, 322 per cent greater than the production of 1962. Weather conditions throughout the full year appeared ideally suited to this crop. Also the increase was assisted by many acres of young plants coming into production. Other cultural factors which have contributed to the success of the cranberry industry are better frost control, early detection and control of insect pests, improved comprehension of fertility requirements, and reduced mechanical injury to plants.

Grapes

Horticulturists in all parts of the Province are receiving a large number of inquiries regarding the establishment of vineyards. In the Okanagan, the main area of production, rapid expansion is hampered by a shortage of suitable land.

The Branch has encouraged the propagation of grape plants locally to avoid the introduction of pests and diseases new to the Province, but the supply falls far short of the demand.

The winter of 1962/63 caused injury in many plantings. In some heavier soils the vines did not become sufficiently dormant and were killed to the ground; in others, killing was complete. In these areas some growers felt that too much water was to blame. In some sections, top-killing and delayed foliation occurred on gravelly knolls. The crop was reduced by as much as 50 per cent in some vine-

yards. Considering the high percentage of 1- and 2-year-old vines in the area and the lack of snow cover, it is remarkable that more plants were not killed.

The cool summer was followed by warm weather in September, and this was enough to provide adequate sugar in most varieties.

Research and demonstration work by horticulturists in the Okanagan include a number of long-term projects. Extensive fertilizer trials are in their third year, but no definite trend has been established. A grape-pruning trial to determine the optimum number of buds per vine is under way at Westbank. A trial to test herbicides for under-trellis weed control is showing promise with Simazin. The following grape varieties are now recommended for limited commercial trial: Schyler, Buffalo, Seibel 13053, S9549, S9110, Bath, and New York Muscat (formerly NY1297). Trial plantings have been made during the past year at Lytton, Lillooet, Spences Bridge, Abbotsford, Langley, Coquitlam, Saltspring Island, and Victoria.

SMALL-FRUIT PROJECTS

Nematode Laboratory

As a result of a training programme at Saanichton Experimental Farm, there has been set up a field laboratory to assist growers in determining whether nematodes are present in crop soils and the level of infestation. Since the programme started in March, 1963, 216 separate analyses have been carried out. Thirty-five per cent of the samples were determined to contain populations of harmful nematodes in sufficient quantities to require treatment. It has been shown that it is not feasible to crop lands carrying a high population of specific nematodes. The service provided has enabled many growers to treat their sites before planting, thus removing nematode injury as a limiting factor in successful production.

Strawberry Certification

The strawberry certification programme continues to run into difficulties. British Sovereign plants produced under the programme by two of the larger operators have proven unsatisfactory when transplanted. The cause of the losses on transplanting has not been fully determined. Tests are currently under way to assess the virus content of the plants in the propagating fields.

Three propagators have been refused certification on fields being grown for 1964 plant sales due to unfavourable growth of the stock. There is expected to be a shortage of suitable plants of some varieties for planting in 1964.

Investigations regarding the propagation of plants on the Gulf Islands, Pemberton Valley, and the North Okanagan are under way. It is hoped that these sites will provide the essential isolation with a relative freedom from frost injury because of moderate climate or snow cover.

Raspberry Certification

The raspberry certification programme was inaugurated in 1961, and the first plants available under the scheme were available to growers in the spring of 1963. There were 100,000 Newburgh and 45,000 other varieties sold in 1963, and it is expected that there will be 41,000 plants for 1964.

The variety which is handicapped by known virus diseases is Newburgh. The other varieties are believed to be free from virus disease, hence there is not the strong incentive for fruit-growers to pay the additional costs necessary to purchase certified plants of varieties other than Newburgh.

Strawberry-plant Storage Trial

Injury to over-wintering strawberry runners has been a major problem to strawberry-growers for many years. One possible method of eliminating this hazard is to lift the plants in the fall and carry them through the winter in artificial cold storage. The success of this technique is influenced by factors such as plant dormancy, storage temperature, containers used, size of plants, and digging conditions through October to December. Very little information was available on strawberry-plant storage, and virtually nothing was known regarding the British Sovereign variety.

A co-operative project to investigate fall storage was instigated by the Horticultural Branch. Co-operators in the project are personnel from the Agassiz Experimental Farm and the Research Station, Canada Department of Agriculture, at the University of British Columbia.

Corn as a Winter Protection Crop for Strawberries

For the past several years the Horticultural Branch has been recommending the seeding of a narrow strip of oats between strawberry rows to assist in providing winter protection. The oats must be seeded in August in order to allow sufficient time for growth. This practice is not compatible with the recommended usage of Simazine herbicide because the chemical, unless carefully shielded, inhibits growth on the oats.

Corn is tolerant to Simazine, so a trial was carried out to determine whether it could act as a substitute for oats. The corn made good growth under favourable conditions and had reached a height of 10 inches at the end of October. A light frost early in November killed the corn as expected, but it was not anticipated that the corn tissue would break down completely. By December there was no trace of the corn plants, and this crop is therefore unsatisfactory for this purpose when used in this manner.

TREE FRUITS

An air of optimism continues to prevail throughout the fruit-growing areas of the Interior. Although the orchard industry has several knotty problems ahead, the price of orchards remains high, and there is a strong demand for land to develop for either orchards or vineyards.

The marketing agency, B.C. Tree Fruits Limited, reports that the volume of apples handled by it was 8,683,859 bushels. This includes both fresh and processed fruit. When the estimated local sales are added to this figure, the total production will be near the previous record, and even greater production is foreseen.

Record-breaking production of both Bartletts and Anjous was attained in 1963, and even larger crops are expected in coming years.

The peach and apricot crop was reduced as a result of bud damage during the cold periods of the winter.

Early in the season, concern was felt over the possibility of marketing the large cherry crop which was in view. Heavy June rains greatly reduced the tonnage and caused marketing troubles because of the brown rot disease, which occurred for the first time since 1948.

The industry has built a controlled-atmosphere storage plant at Kelowna for 126,000 boxes of apples, and it plans to erect additional plants. The grower-owned processing organization plans to erect a cold storage which will have an effect on the plans of the packing-houses for expansion.

The industry is continuing to adopt modern methods of handling fruit. Immersion dumpers in packing-houses have increased, and bulk bins for the handling of pears and apples are now usual. Their use for the handling of peaches and cherries is being tested, and the results are favourable. *See* Appendix No. 9 for estimates of crop production.

Sweet Cherries

What could have been the largest cherry crop since the late 1940's was spoiled by a 33-hour rain which fell at the end of June. At Summerland the loss in the Bings was estimated to be over 90 per cent and in the Lamberts over 50 per cent. The Van variety had 15 per cent splitting and the Sam virtually *nil*. In addition to the loss from splitting, there was a further loss of tonnage since many trees were not worth picking over to extract the good fruit. Many orchards were affected with brown rot for the first time in 15 years. In the Creston Valley the crop was also disappointing.

Sour Cherries

The set on sour cherries was very heavy; consequently fruit size was small. The trees suffered from poor leaf size, leaf hopper damage, mildew, and rust mite. Due to the cool summer, harvesting was not completed until August.

Apricots

This was the smallest crop since 1956. The sudden drop in temperature occurring January 9th was responsible for 95 per cent fruit-bud loss on the Moorpark and Perfection varieties with somewhat less severe losses on the Tilton and Blenheims. Much of the surviving bloom appeared to be weak. Fruitlets were continually sloughing during June and July. There is little doubt that many apricot-trees were in a weakened condition as a result of several years of heavy cropping which probably aggravated the heavy bud kill in January.

Peaches

Low temperatures in January also thinned this crop, especially in the colder locations. From the end of June the threat of brown rot was apparent, and a number of growers applied Captan or sulphur sprays as a precaution against this disease. Cannery peaches which were dipped in Botran for thizopus were also given Captan as a precaution against brown rot.

Early in the harvesting season the weather was unsettled. Redhavens developed some softening during the ripening period. However, by late August the weather had stabilized, and the Vee crop was harvested without difficulty. In contrast to former years, the later Vee peaches were of finer quality than earlier pickings. Contrary to earlier fears, brown rot did not become a serious factor.

The crop ran considerably under estimate. Roadside sales were up sharply and reduced packing-house shipments to some extent; however, many trees did not produce the tonnage expected.

Italian Prunes

The crop was even lighter than in 1961. Many trees were in poor shape, with severe leaf-roll starting early in the season. In most cases, mites were not to blame. It was felt that the trees were suffering rfom the effects of the January freeze.

Pears

Following the light crops of 1961 and 1962, pear-trees blossomed heavily. Weather during the bloom period was warm, bees were active, and the resulting set

was good. Sizing of Bartletts was slow under the heavy load. A heavy crop of medium to smaller sizes was the result. This record crop was in excellent condition and moved to market rapidly.

The Anjou trees also set heavily, but, being five weeks later than Bartlett, came in for better weather. The result was a heavy crop of large-size Anjous. There was little or no Anjou pit. Estimates were exceeded by 50 to 100 per cent in some cases.

Apples

Weather at blossom time was ideal for pollination, and chemical thinning sprays were widely used. In the follow-up hand thinning, growers left more fruit than usual, and up until mid-August friut in many blocks was border line for size. However, excellent growing weather and slow colouring, which resulted in delayed harvesting, combined to produce an estimated 20-per-cent increase in size. The crop turned out to be the second largest ever produced in British Columbia. Slow colouring of McIntosh resulted in a small volume of early movement and a rush at the end of September that could not be handled by the packing-houses. An acute shortage of bins and storage developed, with much fruit remaining outside the packing-houses in warm weather. This situation continued until late in the harvest season. Some process fruit held for Sun-Rype Ltd. was dumped to make harvesting containers available for late varieties. Much of the additional crop came from young trees bearing their first substantial crop, but old trees were more heavily loaded than growers realized. There was not pre-harvest drop. The probability of even larger crops in the next few years presents the industry with the problem of constructing additional handling and storage facilities.

The McIntosh crop was estimated at 60,000,000 pounds, up 20 per cent over the 1962 crop. The percentage of Cee grade and culls was higher than normal because of lack of colour and hail damage. Tailoring of the less desirable sizes and grades has provided a large amount of fruit for processing.

The estimate of the Spartan crop was 3,500,000 pounds, or double the 1962 crop. This variety continues to produce exceptionally high percentages of the Extra Fancy grade even on the older trees. The Spartan crop should double in two or three years.

The Red Delicious crop is up 40 per cent over 1962. Colour was slow to develop, and in some blocks never did reach a satisfactory level. There was very little water core. The Golden Delicious crop finished nicely this season and was up 40 per cent over 1962.

THE FRUIT GROWERS' 1963 CHESTERFIELD CHAUTAUQUA

For more than 50 years, District Horticulturists and associated specialists have been carrying a Chatauqua to the fruit-growers in the Southern Interior of the Province during the winter. Arrangements were made to try a similar series on television because most people in the tree-fruit area have television sets or access to this media. A series of five consecutive morning programmes lasting 90 minutes each was prepared on entomology, pathology, pomology, weather, and a final day of questions and answers. Grower response to the programmes was extremely favourable, and the Branch was encouraged to present a new series in 1964.

INTEGRATED SPRAYING DEMONSTRATIONS

The most extensive demonstration programme in the tree-fruit areas was the integrated spray project, a joint project between the British Columbia Department

of Agriculture and the Research Station at Summerland. Plant pathologists, entomologists, chemists, and horticulturists participated. The plots were located at Oliver, Keremeos, Summerland, Kelowna, and Vernon. The objective of the demonstration was to determine if and where changes in cultural practices and economics could be made in orchard spray programmes. Weekly observations were made by the personnel involved. At the end of the season the project confirmed the feeling of District Horticulturists that the present basis of recommendations for insect and disease control was generally sound. It brought the extension and research staffs much closer together, and they are aware of the complexity of pest problems facing the growers.

NOON-HOUR ORCHARD DEMONSTRATIONS

Two noon meetings of approximately 1 hour each were tried at Summerland to show fruit-growers how to identify mites. Hand-lenses and low-power microscopes were available for grower use in seeing these pests at first hand. This type of extension is easy to organize and takes little of the grower's time. One subject is dealt with, and meetings can be called on short notice when the need is apparent. Greater use will have to be made of this type of meeting so that producers can identify their own problems earlier because District Horticulturists cannot visit every orchard and identify insects or diseases.

LOWER MAINLAND VEGETABLE CROPS

The extremes of weather during the year caused mixed reactions. Spring crops of lettuce, cabbage, and bunching crops were late. In midsummer the canning-corn crop looked as though it would never mature, but by late August was developing rapidly. Harvest conditions were ideal, and in spite of a decline in acreage the total production was greater than that of 1962.

The Lower Mainland is striving for high yields and top quality to maintain its competitive position. To do this accelerated research programmes have been and will be necessary. Pea-growers have provided a grant to the University of British Columbia, and a joint project is under way with Agassiz Experimental Farm officials. The Horticultural Branch brought together bean growers, processors, and research personnel to review the needs of the industry and to develop a course of action which will increase the yield per acre.

The Branch survey of vegetable acreage indicates an increase in acreage of pole beans, bush beans, broccoli, and Brussels sprouts, and a decrease in peas, corn, cauliflower, and potatoes.

Cole crops produced well this year, but horticulturists are concerned about the future of the vegetables in this group because of the strains of root maggots which developed resistant to the pesticides available for control. A similar situation exists in carrots with the carrot rust fly. Research is under way on those problems, and the results are extremely critical to this area.

A large vegetable-processor closed in Vancouver last winter, but others took over most, but not all, of its pea and bean acreage. There are a number of growers looking for alternate crops to peas and potatoes at present, and the Horticultural Branch personnel have addressed meetings on this subject.

An important outlet for vegetables and other produce on the Lower Mainland is the more than 300 roadside stands. The growers provide produce, and the stand operators require increased services from this Branch because they are faced with the same problems as growers selling through normal channels of trade. Appendix No. 11 is a report of vegetable acreage and production in the Province.

INTERIOR VEGETABLE CROPS

Vegetable acreage is again on the increase in the Okanagan Valley, especially the acreage of asparagus, beans, corn, peppers, spinach, and late potatoes. A similar trend was noted in the Kootenay District, with dried peas and potatoes accounting for most of the increase.

An extensive demonstration programme on field tomatoes has received a great deal of attention from personnel of the Horticultural Branch. The project expenses are also shared by the Research Station at Summerland, the Interior Vegetable Marketing Board, and a local processor. The objective of the project is to demonstrate the benefits of good cultural practices. A summer student worked under the supervision of the Branch to ensure that the project received the attention needed to aid the field-tomato industry.

The tomato work is intended to continue for a number of years, but the first year has had some immediate results:—

(1) Early seeding and early planting in the field did not produce an earlier crop of tomatoes than the recommended dates, which are four to six weeks later for the above operations.

(2) The recommended disease-control programme gave a substantial reduction in damage to fruit and leaves from alternaria blight and anthracnose particularly.

(3) The varieties Fireball, Early Red Chief, and Summerdawn each gave higher yields per acre when recommended practices were used as compared with the grower's own programme.

Now that the recommendations are confirmed in field trials, growers will be given the immediate benefits of the project to date in their 1964 production programme.

A programme of selection which began in 1959 to improve the type of sweet Spanish onions has now reached the stage of commercial application. Seed was distributed to several growers in the Okanagan to produce transplants for the 1964 crop. A grower on Saltspring Island has also received seed from the Branch to see if the plants can be grown in a favoured climate within the Province rather than importing them from outside of Canada. Eventually it is expected that the programme will be self-sustaining.

Several years ago a late cabbage of high quality was noted in the Terrace and Houston districts. Samples were supplied to wholesalers, and they feel that it is superior to the imported cabbage; now all of the available supplies are under contract. The Branch assisted in having application made for certification of the variety under the name Houston Evergreen.

The Branch is promoting the development of a larger Interior asparagus industry in co-operation with the Interior Vegetable Marketing Agency. Acreage is now approaching 500 acres, and further plantings will be made in 1964. A new strain, Mary Washington 711, was grown in the Kelowna district and will be distributed to growers for trial in 1964.

NURSERIES

The demand for both tree-fruit and ornamental nursery stock continues to be good. There is a trend in the nursery business to greater separation of the functions of wholesaling, growing, and retailing, and in the past year two important growers have moved wholesale-growing operations out of the Vancouver area to Pitt Meadows and Aldergrove. A continuing stable market for ornamental stock should encourage this trend.

The nursery business in British Columbia continued to expand, and local production is steadily taking over much of the demand formerly filled by imported stock.

Tree-fruits Nursery Stock

Severe winter injury to budded apples and cherries during the 1962/63 winter reduced the crop of tree-fruit nursery stock. There was severe root damage to apple nursery stock in the Kelowna area grown on sandy soil and very little damage on the heavier soils. The situation was reversed with cherries, as although there was a considerable amount of damage on the light soils, the trees on heavy soils were almost completely killed.

The number of fruit-trees of the various kinds produced during the past year was 129,390 apples, 41,415 pears, 21,426 cherries, 4,700 plums and prunes, 8,000 peaches, and 550 apricots.

Hardy Framework Trees

Production of Antonovka has dropped off very sharply as a result of a few unfavourable reports regarding winter injury to trees of this variety. Also, nurserymen do not like Antonovka as it makes straggly, uneven growth in the nursery. There is a fairly heavy production of the variety Red Astrachan, also of Ottawa 292, as hardy framework trees.

Apple Rootstocks

The apple MM104 has replaced EMII as the most popular of the clonal rootstocks. Supply of MMIII has been short, and this has limited production of this stock.

There is a great deal of interest in EM26, but no commercial quantities are as yet available. There will be a sharp increase in EM26 for the coming year.

Where budded rootstocks on sandy soil were severely damaged last winter by cold weather, MM104 was outstandingly the best rootstock, showing much less injury than other clonal roots.

Ornamental Nursery Stock

Roses.—There was a heavy loss of rose buds over the past winter, and this has reduced the over-all crop by about 15 per cent. The remainder of the crop has grown well. Although there is a good demand for roses, competition from low-priced imports prevents expansion of local production.

Coniferous Evergreens.—There is some overproduction of evergreens in small sizes, but there is a good demand for landscape and specimen material. Root-rot continues to be an increasingly serious factor in Lawson's cypress varieties.

Broad-leaved Evergreens.—In past years it has been difficult to grow broad-leaved evergreens, of which rhododendrons are the most important, and compete successfully with imports. This situation has changed, and it is now practical to produce most broad-leaved evergreens locally and to compete very successfully with European and American plants.

There has been a very sharp increase in the quantities propagated in this category, and continuing expansion over the next few years is assured.

Deciduous Shrubs.—Local supplies are adequate for the demand. There are no particular problems and no demand for any increase in production.

Tree-fruit Nursery Stock Certification and Colour Coding.—The colour coding of nursery stock was carried out on a larger scale this year. Five nurseries in the Okanagan were certified, and of 129,390 apples produced by these growers, 99,707

were colour-coded. All cherry stock of the varieties Van, Bing, and Lambert, totalling 9,051 plants was also coded.

There is one additional application for certification in the Okanagan for 1964 and three applications from the Fraser Valley.

There have been a few complaints regarding budwood, but on the whole this programme has worked out very well, with a striking decrease in the number of mixtures showing up in the nurseries. There were no mixtures found in cherries or apricots in 1963.

GREENHOUSES

The greenhouse industry on the Lower Mainland is continuing to expand, with the largest percentage of the new glass area being used for vegetables and chrysanthemums. The Surrey and White Rock areas are now being favoured over Haney for new construction. Greenhouses are continuing to move out of Vancouver and Burnaby. Most of the houses now being built are of improved type of construction, with 20- and 24-inch glass being used in place of the 16-inch, which was formerly standard, and with aluminum framing also being commonly used.

Marketing

The bulk of greenhouse cut flowers was handled by consignment wholesale houses until 1963, when a small group of growers organized a co-operative which operates a Dutch auction market. This market has tended to attract lower-quality flowers, and to date average prices attained have been lower than consignment prices. Participating growers feel that this difference is offset by the much lower cost of marketing, quick settlement of grower accounts, and the absence of dumping.

Greenhouse Demonstration Projects

Tomato Varieties.—The variety Vantage, which was distributed last year under the number V-595, was grown this year on a trial basis in five greenhouses in the Surrey and Haney areas. Performance has been generally satisfactory, yields are slightly lower than for Dominant, but fruit quality is good, and the variety has remained free of leaf mould. The results of these trials have established Vantage as a commercial variety in this area. A number of other varieties are out under test throughout the Province.

Tomato Rootstocks.—Seed of the two F1 hybrid tomato rootstocks, KN and KVF were obtained from England. These rootstocks were used for grafting the varieties Vantage and Dominant. No significant difference was noted between behaviour of the grated plants on the two rootstocks. No attempt was made to test the Verticilium wilt resistance of the KVF rootstock. Plants on both rootstocks grew well, and cropping during the main part of the season was not noticeably different from that on ungrafted plants. Toward the end of the season, fruits on the top trusses of the grafted plants maintained much better size and quality than plants on their own root. Horticulturists plan more extensive trials during the coming season.

Cucumber Rootstock.—The main purpose in grafting cucumbers is to achieve resistance to fusarium root-rot, which has become prevalent during the past few years. Difficulty was encountered with grafting, and further trials are necessary to determine the best method of handling grafted plants. In all locations, plants on both the fig-leafed gourd and the helmet squash showed resistance to fusarium, but grated plants were slow coming into crop and did not yield as well as cucumbers on their own roots.

The small amount of gourd seed available and the poor percentage of successful grafts made it impossible to obtain good comparison between the two rootstock varieties. Larger amounts of the gourd seed and the helmet squash are available and will be used again next year.

Soil Fumigants.—In 1962 the nematode-infested soil was fumigated, using a one-third methyl bromide and two-thirds chloropicrin mixture injected in the same way as the normal chloropicrin greenhouse soil treatment, and covered with plastic. Observations during the 1963 season show that control with the methyl bromide mixture was much better, presumably due to deeper penetration of the gas. There was some nematode infection in the cucumber crop grown on this soil, but this did not occur until late in the season.

The Use of Systemic Insecticides.—The object of this trial was to determine whether or not systemic insecticides, which have been used successfully in the culture of pot chrysanthemums, could be applied before flowering to achieve protection during the flowering period. The treatments were: 10 per cent granular Disyston, broadcast when the plants were 1 foot high, and Meto-systox emulsion, applied as a spray at the same stage, at rates of 1 pint and 2 pints per 100 gallons. A second spray was applied one month later in October.

It was concluded that it would not be possible to use either of the systemic insecticides tested in such a manner as to achieve protection from mites and aphids into the blooming period. Resistance to malathion and diazinon has shown very strongly in aphid infestations this year. It is to be expected that this resistance will increase during the coming season, but the greenhouse specialist will continue work in this field.

Greenhouse Soil Permeability and Watering

Based on observations made in 1962, further soil-modification techniques were tried. This project is now carried out in co-operation with personnel of the Saanichton Experimental Farm.

The greenhouse was divided into three treatments—straw walling, soils modified to the equivalent of a John Innes soil mix (that is, 7 parts loam, 3 parts peat, and 2 parts fine sand), and a check.

The standard variety Tuckqueen was grown for the test. The increase in yield from the John Innes mix over the check was significant, but further work is planned on these soils.

A trickle irrigation system and direct sub-irrigation methods when compared with the standard hand watering gave little difference. The cost of installing the trickle or the sub-irrigation equipment is considerable, but there is a great saving in labour. No recommendations can be made on this first year's trial.

Blotchy Ripening of Tomatoes

The blotchy ripening condition, which has been severe for the last few years on Vancouver Island, has definitely been connected with a weakness in the variety Tuckqueen. This year the variety Vantage was grown in several ranges where Tuckqueen was also grown, and while Tuckqueen blotched severely, Vantage did not.

Deep Steaming of Greenhouse Soils on Vancouver Island

It was known that deeper steaming would be beneficial in controlling pests and disease on greenhouse soils. A co-operative trial was set up by the Horticultural Branch and the Saanichton Experimental Farm in a problem greenhouse to demonstrate the method to growers.

This trial consisted of burying 4-inch concrete drain tiles 20 inches deep in runs 16 inches apart. Headers joined the runs of tiles, and live steam was introduced into the headers. The soil surface was covered with 2-mil plastic. Half the greenhouse was steamed at once, and the soil was brought up to the temparture of 210° F. in about 6 hours. It was difficult to bring up the temperature around the perimeter of the greenhouse, and some modification of the apparatus was made.

The soil was sterilized to a much greater depth than had been possible previously when the grid system was used. The time required to carry out the operation was not substantially reduced, so there was no saving in fuel. Labour, however, was almost eliminated since the grid system required two men to move soil during the whole steaming period, whereas the buried-tile method only required a few minutes of labour to lay the plastic sheets on the surface and move steam leads.

Examination of the plants during the growing season showed them to have less trouble from wilt and from nematode infestation than those in the conventionally steamed houses. Although this method of steaming is expensive to install, the results were good and the saving in labour would offset the cost of installation.

MUSHROOM PRODUCTION

The mushroom industry has shown a slight increase over 1962 production. This year's crop is expected to reach 2.26 million pounds, a 5.7-per-cent increase. This increase may be attributed to expansion of area by established growers and a few new producers.

Last year the mushroom industry was in the midst of an amalgamation programme, but the plan did not materialize, and there are now three separate grower groups controlling the markets.

HOLLY

The holly industry is increasing in size and volume. There are now 128 acres grown commercially, with 92 acres on Vancouver Island and the remainder on the Lower Mainland. New plantings under 10 years of age made up 73 acres, and an increase in production will require new market outlets. There are many problems in the production and handling of this crop which are receiving a share of the time of District Horticulturists concerned.

HORTICULTURAL EXTENSION PROGRAMMES

Demonstrations of fruit-tree pruning, grafting, and fire blight control measures were given by District Horticulturists when they were requested.

Winter short courses and summer field-days were held for small-fruit, tree-fruit, and vegetable growers. Night-school courses were organized on such topics as " Science in Agriculture " and " Farm Financing and Legal Matters."

There were 24 issues of the Horticultural Newsletter, together with regular crop estimates. The Horticultural Branch grower notes were issued by District Horticulturists on a regular basis during the growing season when the need was anticipated.

Newspapers and television and radio stations have been co-operative. The personnel of the C.B.C. at Vancouver have been helpful in presenting timely programmes and bulletins.

INSPECTION AND REGULATORY PROGRAMMES

Under the *Plant Protection Act,* inspections have been carried out as usual on a number of crops, including pears for fire blight, cherries for little cherry,

grapes for phylloxera, tree fruits for unsatisfactory codling moth control, tree-fruit nursery stock for freedom from pests and diseases, also strawberry and raspberry stocks.

FEDERAL-PROVINCIAL FARM LABOUR SERVICE FOR BRITISH COLUMBIA

(A. C. Carter, Director)

The Federal-Provincial Farm Labour committee approved of a plan to allow the local office manager of the National Employment Service in a region to supervise the seasonal farm-labour officers operating in his area. The new arrangement provided more immediate contact with the seasonal offices and better co-ordination of farm-labour activities.

Seasonal field offices were operated at Victoria, Osoyoos, Oliver, Keremeos, West Summerland, Rutland, Winfield, Oyama, and Creston in the past year.

Casual labour was sufficient to meet the local requirements, except for a brief period in June during strawberry-picking and in isolated instances during the apple harvest.

The general contribution of time and space made by radio, television, and newspapers to publicize labour opportunities was a valuable contribution to the producers of this Province.

INSTITUTIONAL FARMS

W. B. Richardson, B.S.A., Superintendet

The institutional farms are associated with hospital operations of the Mental Health Services at Essondale and Tranquille. The functioning of these farms is affected to a marked degree by the integrated activity and programmes of the associated institutions. During the past year we have had excellent co-operation with the Mental Health Services staff concerned, as we have had with the Department of Public Works personnel, on whom we depend to a large degree for the maintenance of our physical plant and facilities.

On April 1, 1963, the activities of our Department were terminated at Colquitz, when the farm and inventories concerned were turned over to the Corrections Branch, Department of the Attorney-General.

In general, we have increased where possible our co-operation with other agencies, such as the University of British Columbia, Livestock Division and Research Branch of the Canada Department of Agriculture, and other branches of our own Department of Agriculture, in carrying out practical applications of programmes and research principles which are of mutual interest and, in turn, a benefit to agriculture in British Columbia.

The following summaries will indicate in more detail the operation at Colony and Tranquille Farms during the past year.

COLONY FARM

The weather picture for 1963 was close to normal, with more than the average rainfall received during the summer months of July and August. A record rainfall was recorded for the month of December.

The physical area of the farm was reduced somewhat, when the barns and associated fields previously used in the Home for the Aged sector at Essondale were turned over to the Department of Public Works.

General maintenance this year included renewal of the main power-line and bullpens. Major repairs were made to the piggery pens and troughs, along with the installation of a steam-line to the piggery. The steam will be used for cooking feed and for general cleaning.

Milk production in the dairy herd was maintained at a high level, as indicated by the six honour-list records made during the year. These represent the highest records made in Canada in the various age-groups for the year concerned. The entire herd averaged 134 to 130 per cent B.C.A. for 247 completed records.

Two bulls were sold to the British Columbia Artificial Insemination Centre at Milner; several others went to private breeders. A number of female calves were sold to 4-H Club members for their projects, and a group of male calves went to the University of British Columbia for use in work on feeding steers of the dairy breeds.

Colony Cyclone Vale Sir Vrouka 6th, who was used very heavily in the Colony here, was designated as a superior-type sire, having 101 daughters 61 per cent good plus or better. He has also been a satisfactory production sire, with 57 tested daughters having a B.C.A. of 119 and 113 per cent. The herd participated in the British Columbia Holstein Association exhibit at the Class A fairs at Calgary and Edmonton, and at the National Holstein Shows at Saskatoon and Regina. The herd was also represented in the association exhibit to the Pacific International at Portland. Our usual exhibit was made at the Pacific National Exhibition, and again won the premier breeder and exhibitor awards.

The sale of breeding stock from the swine herd was again very active locally, and a good number of animals were also exported to the United States. Contributions were made to the Annual British Columbia Swine Breeders' Sale. This same group held its annual field-day at Colony Farm in June. During the past few years a project on cross-breeding has been carried out in the Farm swine herd with the co-operation of the Livestock Division of the Canada Department of Agriculture. The information gathered from this project was published in bulletin form recently by our Department. Another project on copper metabolism is being carried out by the Mental Health Services, using 8 sows from the herd.

Record of Performance testing has also been initiated in the swine herd, but it will take some time before sufficient information is gathered to make it useful.

Results of the use of the Polled Dorset ram OSU 815, imported from the Oklahoma State University, are now becoming evident in the sheep flock. Lambs from this sire won the Greenway Trophy at the Pacific National Exhibition in competition with all other breeds. Considerable interest is evident in Polled Dorsets, judging from our sales in British Columbia. Several rams were also exported to Alberta and Washington, U.S.A. Two polled ewes were purchased at the Oklahoma Polled Dorset Sale, to increase the blood for the polled characteristic in our flock. Record-keeping for weaning and fleece weights has also been initiated.

The Research Branch of the Canada Department of Agriculture has, for the second year, maintained test-plots at Colony Farm, which provided space for it to do practical work on carrot rust fly and potato leaf roll.

TRANQUILLE FARM

This year additional pens were provided in the beef yards which allow for feeding trials. Because of mutual interests of Mental Health Services, Public Works, and Agriculture, arrangements were made with the Game Branch to have the entire institution area, including the farm, declared a restricted area for hunting.

Similar interests of the departments concerned were also effective in cleaning out the squatter shacks located along Tranquille Creek up to the domestic-water intake.

There has been a marked increase in the patient population in The Tranquille School this past year, which makes for more efficient use of farm produce, also making it easier to schedule the farm operations.

During the year a formal agreement was drawn up between the Government of Canada and the Government of British Columbia concerning the use of cattle, land, and facilities located at Tranquille Farm and the Research Station, Kamloops, for their mutual advantage in carrying out work benefiting the beef-cattle industry.

In an attempt to measure possible genetic difference in the beef herd resulting from several years of selection, a total of 30 selected steers was put on a high-energy non-roughage feeding trial. Twenty of these steers were fed at the University of British Columbia and the remainder at Tranquille. The information on rate of gain and carcass evaluation resulting from this project will be passed on to the Live Stock Branch for assessment.

The beef herd has been bred artificially the past two years, and results seem to indicate that this method of breeding, once with frozen semen, along with the use of catch bulls can give quite satisfactory results.

In co-operation with the British Columbia Artificial Insemination Centre and the Livestock Branch, Canada Department of Agriculture, 6 sire groups of 10 steers each, the result of artificial breeding to sires at the centre, have been put on feed to determine their rate of gain. This information will be valuable in assessing the breeding worth of the sires represented.

Participation in Record of Performance has been instituted in the swine herd. Sales of swine breeding stock have been quite brisk, and it is pleasing to note the numbers of the more outstanding swine-breeders in the Province who have made good use of the breeding stock obtained in Tranquille.

Hay crops at Tranquille were estimated to be approximately 1,250 tons last year. A considerable quantity of the alfalfa hay is moved to Colony Farm for dairy-cattle feeding.

The following figures represent production on the farms during the fiscal year 1962/63:—

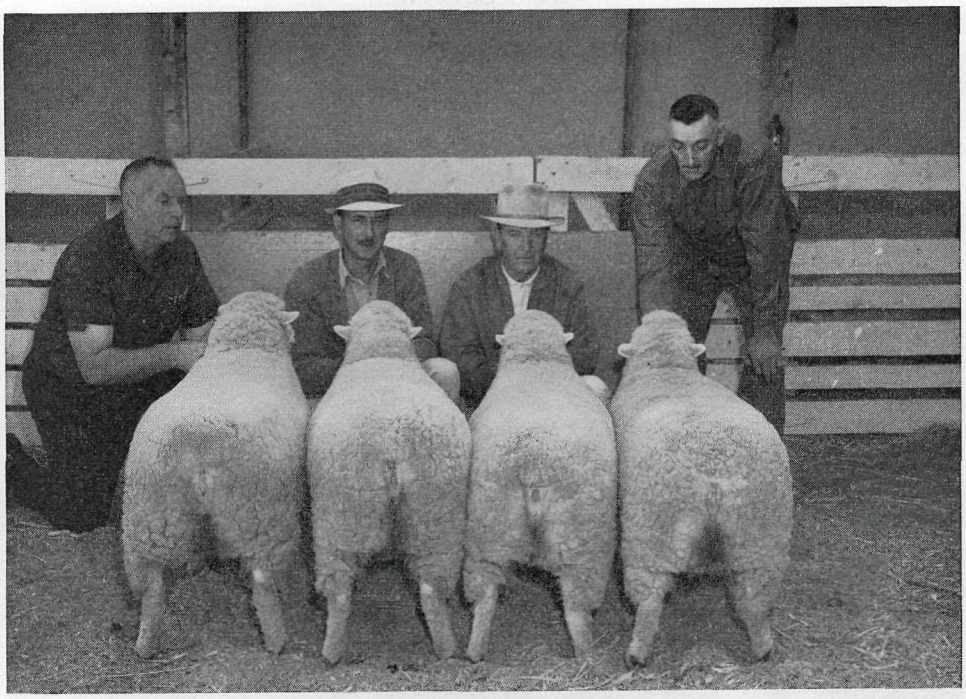
Produce to Institutions		Colony Farm[1]	Tranquille Farm[2]
Milk and cream	gal.	282,334	51,732
Meat (beef and pork)	lb.	255,146	122,086
Potatoes	,,	1,236,895	----------
Other vegetables and fruit	,,	207,924	136,290
Canned Vegetables and fruit	cans[3]	5,500	----------

[1] The above products plus outside sales of breeding stock and miscellaneous items represent a total produce value of $443,878.

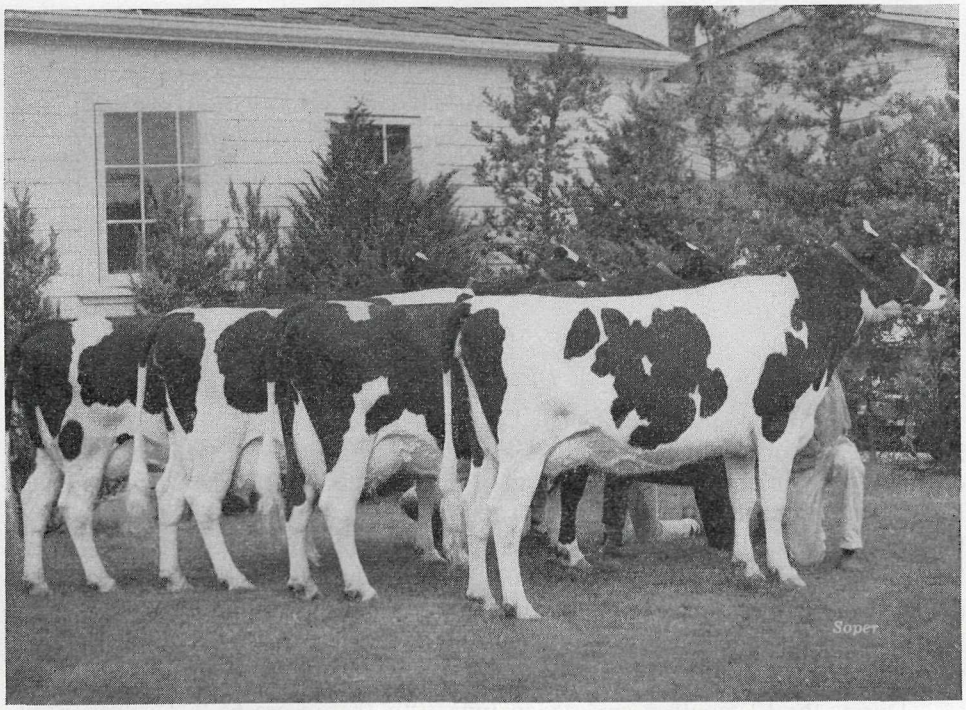
[2] The above products plus outside sales of breeding stock and miscellaneous items represent a total produce value of $135,547.

[3] Six gallons each.

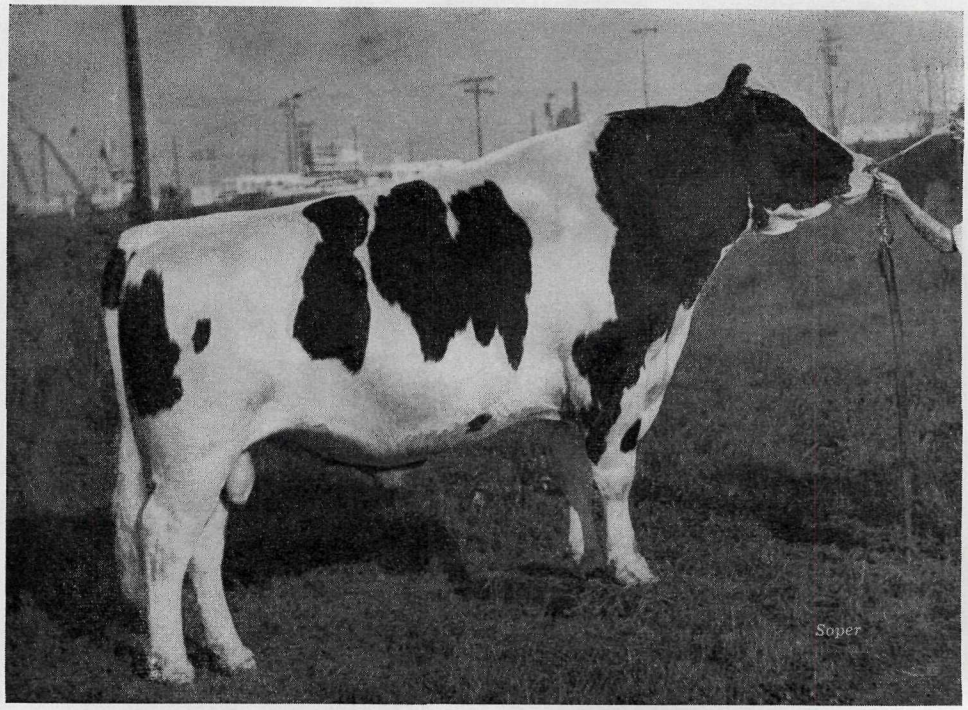
Institutions receiving farm produce from Colony and Tranquille Farms include Provincial Mental Hospital, Essondale; Woodlands School; Burnaby Health Centre; Correctional Institution, Haney; Provincial Mental Home, Colquitz; Tranquille School; Provincial Gaol, Kamloops; Provincial Home, Kamloops; Oakalla Prison Farm; and Forestry Camp, Clearwater.



Greenway Trophy winners, Pacific National Exhibition, 1963—best four lambs of any breed. Sired by OSU, polled ram owned by Colony Farm.



Senior get of sire by Colony Cyclone Vale Sir Vrouka 6th, first prize, Pacific National Exhibition, 1963.



Colony Korndyke Sir Mildred,
first prize aged bull, senior and grand champion, Pacific National Exhibition, 1963;
reserve grand champion, Pacific International, Portland, 1963.

LIVE STOCK BRANCH

A. KIDD, V.S., D.V.M., D.V.P.H., LIVE STOCK COMMISSIONER AND CHIEF VETERINARY INSPECTOR

VETERINARY DIVISION

(Dr. A. Kidd)

ACTS

Contagious Diseases (Animals) Act

British Columbia was not declared a certified brucellosis-free area during 1963 as the Health of Animals Branch, Canada Department of Agriculture, did not complete the initial tests of cattle in the Cariboo-Central British Columbia-Peace River portion of the Province. Due to retests required to maintain other parts of the Province as certified (brucellosis-free) and accredited (tuberculosis-free) areas, Veterinary Inspectors of the Health of Animals Branch were not at liberty to complete the initial brucellosis tests in that portion of the Province that remains. Progress was made and will continue until the entire Province is a certified brucellosis-free area.

During the 12-month period ended June 30th, there were 65,971 calves inoculated with brucella vaccine. Payments to veterinary practitioners for services

rendered during the calfhood vaccination year were $70,110. Total payments since the inception of free calfhood vaccinations on May 1, 1956, now amount to $437,514. The total of calfhood vaccinations under the Federal-Provincial Brucellosis Control Programme is listed in Appendix No. 1.

Veterinary Inspectors of this Department vaccinated 876 calves on 104 premises and blood-tested 52 cattle on 5 premises.

Vibriosis continues to be a sporadic problem in beef-cattle herds. No new cases of vibriosis were diagnosed in sheep; the two affected ranches uncovered last year remain as the only known cases so far.

Laboratory results positively diagnosed equine encephalomyelitis as the cause of death in one horse near Marysville in the East Kootenay. It is expected this disease will be much more widespread during 1964, and horsemen will be advised to use protective vaccination.

The Pulmonary Emphysema Committee had two meetings during the year. The bovine pulmonary emphysema project, for the second year, was again carried out on Tranquille Meadows and headed by a Veterinary Inspector of this Department. The results of this year's findings indicate that the cause may be due to fungi or fungi spores and (or) toxins, with the sedge *Carex rostrata* being of particular significance. A larger objective of eventually screening the fungi to find whether mycotoxicosis is the cause of pulmonary emphysema of cattle is required. It is felt any future experimentation, directed at finding the active principle causing the disease syndrone, must be carried out by the Research Branch of the Canada Department of Agriculture as no university or Provincial laboratory has the facilities or staff to carry out the work. Every effort toward setting up the 1964 project accordingly is being made.

Infectious bovine rhino-tracheitis (I.B.R. or red nose) was found to be the cause of a serious situation in five herds of cattle in the Francois Lake area. The investigations revealed that the disease was likely brought in through cattle purchased in March at a live-stock auction yard.

Veterinary Inspectors carried out routine inspections for foot-rot on 15,670 sheep at 16 sheep-ranches before grazing permits were issued allowing sheep on Crown lands. One flock was quarantined until the foot-rot was cleaned up.

Veterinary Inspectors reported on many cases of malnutrition, parasitism, weed poisoning, and sporadic disease conditions such as foot-rot, pink eye, blackleg, malignant œdema, enteritis, pneumonia, and hæmorrhagic septicæmia.

Fur-farm Act

A total of 422 fur-farm licences was issued and $5,335 collected. The number of breeding males and females were: Mink, 132,066; chinchilla, 9,256; nutria, 240; fox, 30; and marten, 29. Inspectors made a total of 87 fur-farm visits.

The one distemper quarantine remaining in effect at the year-end of 1962 was lifted. Distemper was found to be present on seven fur-farms, and each premises was posted with a public notice. No cases of virus enteritis were diagnosed.

Inspectors attended the Mink Breeders' Short Course and the Sixteenth Annual Live Mink Show.

Four mink-ranchers were charged under section 5 of the *Fur-farm Act* for operating without a fur-farm licence. All four pleaded guilty and were fined $10 and assessed costs in each case.

Meat Inspection Act

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

Establishment No.	Establishment and Location	Class	Federal Grading Service
1	Clappison Packers Ltd., Haney	A	Yes
2	Seed & Pitts Ltd., Pitt Meadows	B	Yes
4	Star Meat Co. Ltd., Abbotsford	B	No
5	Kohler's European Sausage Ltd., Aldergrove	A	Yes
7	Cambie Stock Farms Ltd., Richmond	A	Yes
9	Borsato Meat Ltd., Langley	A	Yes
10	Delta Cold Storage, Ladner	B	No
11	Van Isle Meat Packers Ltd., Victoria[1]	B	Yes

[1] Van Isle Meat Packers Ltd. licensed April 1st.

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

Species	Carcasses Marked "B.C. Passed"	Carcasses Condemned	Total	Percentage Condemned	Portions Condemned
Cattle	9,563	67	9,630	0.69	2,203
Calves	15,625½	373¾	15,899	2.35	288
Sheep	650½	3½	654	0.54	153
Lambs	1,460	1	1,461	0.07	176
Swine	10,409	19	10,428	0.18	2,999
Goats	86	1	87	1.15	28

Causes of carcass condemnations were sa follows:—

Cause	Cattle	Calves	Sheep	Lambs	Swine	Goats
Arthritis	3¼	4	----	----	----	----
Bruises	12	17½	----	1	2	----
Emaciation and mucoid	9	42	3½	----	2	1
Immaturity	----	151	----	----	----	----
Imperfect bleeding	2	5	----	----	1	----
Leukemia	----	----	----	----	----	----
Mammitis	5	----	----	----	----	----
Metritis	4	----	----	----	----	----
Nephritis	3	19	----	----	----	----
Pericarditis	9	----	----	----	----	----
Peritonitis	1	17	----	----	----	----
Pneumonia and pleurisy	¾	38	----	----	----	----
Septicæmia and pyæmia	11	55	----	----	7½	
Pyrexia	----	2	----	----	----	----
Tuberculosis	----	----	----	----	----	----
Retained placenta	1	----	----	----	----	----
Cancer	3	----	----	----	----	----
Uremia	1	----	----	----	----	----
Enterotoxæmia	2		----	----	----	----
Dead on arrival	1	12	----	----	2	----
Contamination	----	8¼	----	----	----	----
Icterus	----	1	----	----	----	----
Anæmia	----	1	----	----	----	----
Diphtheria	----	1	----	----		----
Swine erysipelas	----	----	----	----	3	----
Abscess		----	----	----	½	----
Rhinitis	----	----	----	----	1	
Totals	67	373¾	3½	1	19	1

Inspection of carcasses slaughtered by farmers and presented, with head and pluck attached, to Meat Inspectors at licensed abbatoirs amounted to the following:—

Species	Carcasses Marked "B.C. Passed"	Carcasses Condemned	Total	Percentage Condemned	Portions Condemned
Cattle	139	----	139	----	4
Calves	131	----	131	----	----
Sheep	3	----	3	----	----
Lambs	1,544	----	1,544	----	170
Swine	7,694	----	7,694	----	948
Goats	127	1	128	0.868	----
Rabbits	193	----	193	----	----

(One goat carcass condemned because of emaciation. All carcasses inspected at Cambie Stock Farms Ltd. and Van Isle Meat Packers Ltd.)

During the early part of 1963 it was decided that full-time Departmental Meat Inspectors would be placed in the eight abattoirs licensed under the *Meat Inspection Act*. As a result, a Meat Inspectors' Training Course was held, and in due course eight men were employed to provide full Provincial meat inspection service, which commenced on April 1st in the seven abattoirs located in the Lower Fraser Valley and the one on Vancouver Island. The Veterinary Inspector from the Prince George office was moved to Cloverdale and another to Abbotsford to assist the Veterinary Inspector already located there. These three Veterinary Inspectors supervise the eight Meat Inspectors located in each licensed abattoir. In providing this supervision, 1,505 visits were made to licensed abattoirs and 73 to farmers' premises in the two meat inspection areas—the Coquitlam Meat Inspection Area, established on February 15th, and the Greater Victoria Metropolitan Meat Inspection Area, on April 1st.

With the commencement of this service, plant operators were required to pay this Department an inspection fee at the rate of $1 per unit and 50 cents additional per unit for overtime.

Meat inspection fees collected from April 1st to December 31st were as follows:—

Plant kill—	
Fee	$13,317.50
Overtime	73.39
Farm kill—	
Fee	2,158.86
Overtime	78.89
Total	$15,628.64

This unit cost is based on one unit being the equivalent of 1 cow, 4 calves, 4 sheep or lambs, 4 pigs, 4 goats, or 50 rabbits.

This service is provided in abattoirs that are constructed to the requirements of the *Meat Inspection Act,* where the volume of the operations is not sufficient to warrant inspection by the Health of Animals Branch, Canada Department of Agriculture.

Milk Industry Act

The decrease in the number of approved dairy-farms continues, and the volume of milk produced is being maintained. Considerable dairy-farm construction and

reconstruction is taking place to accommodate increased production. The number of farm holding-tanks, pipe-line milkers, and milk-transfer systems installed amounts to hundreds of each during the year. In addition to regular dairy-farm inspections, Dairy Farm Inspectors also made 1,222 visits to advise on farm construction, 593 visits to issue farm holding-tank permits and to advise on installation, and 37 visits to collect milk samples for quality tests by the Dairy Branch.

Veterinary Inspectors examined 202 cows on 14 dairy-farms for clinical cases of mastitis and found 124. Of these cases, treatment was recommended for 109 cows and 15 were eliminated as incurable.

One person charged under section 5 of the *Milk Industry Act* for illegal sale of milk pleaded guilty and was fined $15 and assessed costs.

The Dairy Inspector established in the Prince George office during April has been designated to carry out dairy-farm inspections for the Central British Columbia district.

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

General

Under the Veterinary Service District Policy, the four districts serviced by veterinary practitioners at the year's end were Dawson Creek, Fort St. John, Smithers, and Williams Lake. Each practitioner received the maximum grant. The Fort St. John Veterinary Service District commenced on May 15th, and the agreement at Prince George expired on July 15th and was not renewed.

Dairy Farm Inspectors, as Deputy Brand Inspectors, carried out duties at live-stock public sale yards, farms, and slaughter-houses. Under the *Stock Brands Act*, they made 427 visits; under the *Beef Cattle Producers' Assistance Act,* 259 visits; and under the *Horned Cattle Purchases Act,* 260 visits.

Great interest has been shown all year on the matter of pesticide residues in food for human consumption. The Honourable the Minister of Agriculture established two committees—one the Committee on the Sale and Distribution of Poisons, Drugs and Medicines in Agriculture, and the other the Safe Use of Chemicals in Agriculture Committee. The first named is an Advisory Committee on the Minister's participation in the *Pharmacy Act*, and the second is also an Advisory Committee of Departmental officials to advise on programming to prevent the misuse of pesticides. At the request of the Safe Use of Chemicals in Agriculture Committee, the Dairy Farms Inspectors, using a form headed "Spot Survey of Insecticides Used by Milk Producers," returned 334 properly filled-in forms which provided very useful information for analysis purposes.

Practically all staff members, in varying degrees, have participated in civil defence activities.

LIVE STOCK DIVISION

(R. L. Wilkinson, B.S.A.)

Acts

Animals Act

During 1963, 16 bull districts, 13 bull-control areas, and 3 stallion-control areas remained operative throughout the Province under provisions of the *Animals Act* and regulations thereto.

The regulations *re* artificial insemination were amended by rescinding Division 3 and rewriting it to provide the Live Stock Commissioner with authority for refusal,

suspension, or revocation of both artificial insemination centre and technicians' licences. This degree of authority was necessary to ensure that specific minimum requirements related to quality control would be met.

A total of 25 artificial insemination centres, including 2 semen-producing centres and 60 technicians, was licensed during 1963. Five of the latter were newly qualified licensees following examinations in theory and practice conducted by the Board of Examiners.

Appendix No. 3 contains a list of licensed artificial insemination centres and the number of first services carried out by each during the 1962 calendar year. Because of the 60–90-day non-return basis of reporting services and conception rates, it is not possible to report total annual services until after March 31st the following year. It is anticipated, however, that the number of first services reported by centres in 1963 will be up slightly over those reported for 1962.

Beef Grading Act

Through legal consultation early in 1963 it became evident there was no power within the above-mentioned Act to authorize the making of a prohibition by regulation. It was therefore necessary to rescind section 7.05 of the regulation, which in effect stated that all beef sold in the Greater Vancouver area must be graded. It is expected this action will have no effect on the grading of beef in British Columbia since present trends in supermarket meat-merchandising policies tend to increase the demand for graded beef rather than decrease it. A section of the *Beef Grading Act* which, in general, states that all beef sold in British Columbia must be graded has proven to be unrealistic. An amendment has been submitted for legislative consideration early in 1964.

Sheep Protection Act

Claims for compensation from the Dog Tax Fund for loss of goats, sheep, and poultry to the actions of unknown dogs continue at a level consistent with those of the previous two years, as shown by the following table:—

Year	Goats		Sheep		Poultry	
	Number	Compensation	Number	Compensation	Number	Compensation
1961	2	$42.50	197	$3,767.00	685	$574.21
1962	1	15.00	227	4,194.00	1,417	1,472.00
1963	1	20.00	221	4,640.00	725	674.36

POLICIES

Artificial Insemination Assistance Policy

Assistance was provided to the British Columbia Artificial Insemination Centre in support of its young sire evaluation programme to the amount of $5,797.44. A further amount of $1,427.74 was paid to the centre for technical services to and training new technicians for other semen-distribution centres located within the Province.

Frozen-semen cabinets were placed with artificial insemination centres at Vanderhoof, Kamloops, Fulford Harbour, Nakusp, and Courtenay at a total cost of $2,550.77 to the Department through the Frozen Semen Cabinet Purchase Assistance Policy which was implemented in 1962.

The Live Stock Inspector maintained a regular check of frozen-semen ampules at the British Columbia Artificial Insemination Centre, Milner, as required by the Canadian Joint Dairy Breeds Committee for purebred cattle, Brantford, Ont.

Cattle Placement Policy

Dairy Cattle.—In 1963, under this policy, 22 head of Holstein cattle, including 8 registered and 13 grade heifer calves and a grade cow, were selected by the Live Stock Inspector from Fraser Valley Dairy Herd Improvement Association herds and shipments arranged to Westbank and Sandspit in the Queen Charlottes.

During the 14-year period since inauguration of this programme, a total of 825 head of dairy cattle has been selected from Fraser Valley D.H.I.A. herds by the Live Stock Inspector and shipments arranged, in response to requests from District Agriculturists and dairy-farmers throughout the Province for aid in locating same.

In the last two or three years, possibly due to the "freezing" of milk quotas by the Milk Board, the number of requests to locate dairy stock has dropped markedly, particularly in the Okanagan, from which area the bulk of this type of inquiry has been received.

Beef Cattle.—Two registered Hereford yearling bulls were selected by the Live Stock Inspector from Fraser Valley beef-breeders and shipment arranged to the Courtenay area on Vancouver Island.

Purebred Sires Purchase Assistance Policy for Farmers' Institutes

The purchase of only 5 bulls under this policy during 1963 indicates a sharp decline from total purchases of 17 and 23 made in 1962 and 1961 respectively. The 5 Hereford bulls were purchased at a cost of $2,050 and 1 Yorkshire boar for $45.

Live Stock Improvement Policy

Under this policy 1 boar and 1 ram were transported into the Peace River Block.

Federal-Provincial Sheep Transportation Assistance Policy

This policy was used more extensively during 1963 than it has since its beginning in 1961 as four shipments totalling 1,279 qualifying ewes were handled. These qualifying white-face western range ewes were imported in almost equal numbers from Alberta and Saskatchewan.

Live Stock Exhibition Board Policy

This policy was prepared and offered for the first time in 1963. It was designed to provide a standard measure of assistance to live-stock breeders of the Province who wished to exhibit at large international shows—namely, the Royal Agricultural Winter Fair at Toronto and the International Livestock Exposition at Portland. A great deal of the Assistant Live Stock Commissioner's and the Live Stock Inspector's time was utilized in designing the policy, arranging for it to function, co-ordinating the selection of satisfactory breed exhibits, co-ordinating transportation arrangements, and, finally, assembling all accounts and arranging for their payment. The effort made by exhibition board members and breeders alike was, however, reflected in the excellent achievement of the British Columbia exhibits at both the Royal and the Portland International, some of the highlights of which are as follows:—

At the Portland International:—

Holsteins.—First place junior heifer calf, B. Giacomazzi; first 4-year-old cow and reserve grand champion, W. C. Blair; first and second

progeny of dam, W. C. Blair; second aged bull and reserve grand champion, Colony Farm; second junior get of sire, B. Giacomazzi; second best three females, Colony Farm; second senior get of sire, W. C. Blair; second junior get of sire, Colony Farm; second state herd, from B.C. exhibit.

Ayrshires.—First aged bull and senior and grand champion, Ryder Lake Farm; first senior heifer calf, Charles Dawson; first junior get of sire, Charles Dawson; first 3-year-old cow, J. A. Balme; first aged cow and senior grand champion, Ryder Lake Farm; first state herd, from B.C. exhibit.

Jerseys.—First junior yearling bull, S. Spetifore & Sons; first 2-year-old bull, S. Spetifore & Sons; second 2-year-old bull, W. H. Savage; first aged bull and senior grand champion, Bellavista Farm; first junior yearling heifer, W. H. Savage; first senior yearling heifer and junior champion, S. Spetifore & Sons; first 2-year-old cow, S. Spetifore & Sons; first 4-year-old cow, W. H. Savage; second 4-year-old cow, S. Spetifore & Sons; first senior get of sire, S. Spetifore & Sons; first state herd, from B.C. exhibit.

Suffolks.—First yearling ewe and grand champion, Pat Reid.

Shropshires.—Second in every class and reserve grand champion ram, Percy Olley.

Cheviots.—Second yearling ram and reserve grand champion, Pat Reid; second ram lamb, Pat Reid; second pen of ram lambs, Pat Reid; second yearling ewe, Pat Reid; second ewe lamb, Percy Olley; second pen of ewe lambs, Percy Olley.

Sheep Market Classes.—First pen of Cheviot market lambs, Fred Keiner; second pen of Cheviot market lambs, Percy Olley; first Cheviot market lamb, Fred Keiner; second carcass class, Percy Olley.

At the Royal:—

Guernseys.—First and second 4-year-old heifer in milk and senior and grand champion female, Murray Davie; second 2-year-old heifer not in milk, Murray Davie; third 2-year-old heifer in milk, R. J. Livingstone; first breeder's herd, Murray Davie; first senior get of sire, Murray Davie; first and second national 3-year-old futurity, Murray Davie. Mr. Davie's winnings also included six of the seven Guernsey trophies offered.

Ayrshires.—First junior bull calf, W. H. Savage; third cow 3 years and under 5 dry, W. H. Savage; second junior get of sire, Charles Dawson.

Herefords.—First senior heifer calf, H. N. Boultbee; first spring yearling heifer and junior champion, H. N. Boultbee; second get of sire, H. N. Boultbee; third breeder's herd, H. N. Boultbee; third summer yearling bull, H. N. Boultbee; third senior bull calf, H. N. Boultbee; third senior yearling heifer, Bryan M. Porter.

The cost of applying the exhibition board policy to the various live-stock exhibits sent to Portland was as follows:—

	Head	Cost
Holsteins	19	$381.00
Jerseys	29	610.00
Ayrshires	12	234.00
Sheep	66	428.50
Totals	126	$1,653.50

And to those sent to the Royal:—

	Head	Cost
Guernseys	18	$662.00
Ayrshires	8	242.00
Herefords	18	562.00
Swine	16	274.00
Totals	60	$1,740.00
Provincial share of freight		801.16
Total		$2,541.16

General

The Live Stock Inspector attended all meetings of the British Columbia Artificial Insemination Advisory Committee in his capacity as secretary. He also acted on all B.C.A.I. Sire Selection Committees and as secretary of the Live Stock Exhibition Board.

The Assistant Live Stock Commissioner attended all meetings of the Artificial Insemination Advisory Committee, Board of Examiners, Sheep Steering Committee, and one meeting of the Beef Cattle Advisory Committee. He also acted as chairman of the Live Stock Exhibition Board, Swine Record of Performance Committee, and the newly appointed Beef Cattle Record of Performance Committee. Other responsibilities of this kind included being a member of the Programme Planning Committee of the Stockmen's Conference, Sheepmen's Short Course, Swine Breeders' Short Course, and the University of British Columbia Farm Field-day.

The Live Stock Inspector attended all annual meetings of the dairy breed associations and the Swine Breeders' Association to speak on pertinent subject-matter. He also addressed meetings of Fraser Valley dairymen at Cloverdale, of the Arabian Horse Association at New Westminster, and of horsemen at the University of British Columbia Conference.

The Live Stock Branch, assisted by personnel of the Extension Branch, sponsored sheep field-days throughout the Province at Duncan, Abbotsford, Kamloops, and McBride. All events were well attended.

The second Annual Bred Gilt Sale, sponsored by the British Columbia swine breeders and supported by the Department, was an outstanding success. Both the Live Stock Inspector and one of the Veterinary Inspectors acted on the Selection Committee. Seventeen head of registered pigs were sold, including 14 gilts and 3 young boars. Gilts of four breeds were offered—Lacombe, Berkshire, Yorkshire, and Landrace. It was readily apparent that buyers were not interested in bred Berkshire gilts. Only two of this breed were consigned to the sale, and one was not sold. In 1962 the 14 Yorkshire gilts offered were sold for an average of $110.50. In 1963 the 7 Yorkshire gilts offered sold for an average of $137.43, $27 more per gilt than in 1962. Landrace gilts in 1963 sold for an average of $113.25, which was $28.25 higher per gilt than the average price of $85 received for Landrace gilts sold in the 1962 sale.

Both the Live Stock Inspector and the Assistant Live Stock Commissioner acted on a panel of speakers on the subject of " Beef Production " at meetings held at Ladner and Chilliwack. The latter addressed a series of nine meetings in the Central Interior and Peace River area on the subject of " Beef Herd Management," a series of four meetings on Vancouver Island on the subject of " Winter Feeding Dairy Cattle," and a meeting in Pemberton on beef production. All of the aforementioned programmes were arranged by personnel of the Extension Branch.

The Assistant Live Stock Commissioner was appointed to the Community Pastures Project Committee established under the Federal-Provincial Agricultural Rehabilitation and Development Act, and in this capacity participated in the committee activities associated with the development of community pastures in the Peace River area and attended a three-day A.R.D.A. workshop in Ottawa.

Publications

A report on hog crossbreeding trials conducted at Colony Farm from 1960 to 1963 was published for benefit of swine-producers. The Live Stock Inspector has been collecting data for a further bulletin on swine production. The Branch has a fairly extensive list of mimeographed circulars available for distribution, but consideration is being given to presenting more of the material in bulletin form.

Live-stock Demonstrations

Close liaison is being maintained with the Superintendent of Institutional Farms and his staff at Tranquille Farm, where for a number of years the beef herd has been used as a pilot demonstration for a commercial performance testing programme. Valuable data were obtained from a project completed in April of 1963 in which 30 of the performance recorded steer calves were fed to slaughter weight on a high-energy low-roughage ration. Twenty of the calves were fed at the University of British Columbia in the Beef Cattle Research Laboratory and 10 at Tranquille Farm. A more extensive project designed to progeny-test a group of steer calves sired by Hereford bulls at stud in the British Columbia Artificial Insemination Centre got under way in December of 1963 when 60 calves were started on feed. The Canada Department of Agriculture, the British Columbia Department of Agriculture, and the British Columbia Artificial Insemination Centre are working co-operatively in this project, which was arranged by the staff of this Branch.

A commercial sheep performance project, which is partly investigational and partly demonstrational in nature, has been under way with six sheep-producers of the McBride-Dunster area. The Live Stock Branch is co-operating with the Extension Branch in this regard.

During 1963 the staff of this Branch assisted with arrangements for and participated in live-to-carcass demonstrations for beef at the Provincial Winter Fair at Kamloops, for sheep at three of the four field-days, and for swine at the Swine Breeders' Short Course.

BRANDS DIVISION

(Thomas Moore)

Inspection Service

Brand inspection was carried out by the Royal Canadian Mounted Police at 70 shipping points and by Brand Inspectors and Deputy Brand Inspectors at 27 points.

Brand Inspection

A total of 148,314 head of cattle was inspected, a decrease of 5,337 from 1962. Horses inspected numbered 9,629, an increase of 1,081. There were 12,173 hides inspected, a decrease of 3,091. Kamloops-Nicola area had 54,934 cattle inspected, an increase of 96 head. Cariboo cattle inspections totalled 26,733, a decrease of 6,628. (*See* Appendix No. 4.)

Exports to United States

Total cattle exported from British Columbia to the United States from January 1st to December 31st numbered 15,910, of which 13,462 head moved from Interior points. This is 14,224 less than in 1962, and comprised 390 bulls, 1,206 cows, 7,517 steers, 713 heifers, and 3,636 calves. (Figures by courtesy of the Health of Animals Branch, Canada Department of Agriculture, Vancouver.)

Flood, Fernie, and Golden Check Points

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

	1962	1963
Flood—		
Cattle	14,686	18,918
Horses	1,855	2,723
Hides	6,349	4,254
Dressed beef (quarters)	596	494
Number of trucks checked	1,868	2,467
Fernie—		
Cattle	12,543	8,110
Horses	433	155
Hides	160	----------
Number of trucks checked	628	502
Golden (January to November, 1963)—		
Cattle	1,792	3,715
Horses	52	265
Hides	----------	271
Number of trucks checked	80	188

Brand Book Supplement No. 3

The annual supplement, No. 3, to the Brand Book, showing all brands issued in 1963, will be compiled in 1964 and will be available later in the year.

Amendments

Amendments were made to the *Stock Brands Act, Beef Cattle Producers' Assistance Act* and the *Horned Cattle Purchases Act*. Regulations were passed by Order in Council to the *Stock Brands Act* authorizing the use of an identification brand by permit, and the Schedule of Fees was amended.

Convictions under the Criminal Code

Nine convictions for theft of cattle were obtained by the Royal Canadian Mounted Police during the year.

Convictions under the Stock Brands Act

Eleven prosecutions were made under the above Act by the Royal Canadian Mounted Police and our Brand Inspectors. Eleven convictions were obtained.

DAIRY HERD IMPROVEMENT SERVICES

(J. A. Mace)

Operation

Twenty-six D.H.I.A. routes continue in operation. Semi-annual reports from supervisors show 544 herds and 19,158 cows on test as at June 30, 1963. Herd size continues to increase and now averages 35.2, an increase of 0.7 over the previous year. In 1953 the average herd on test contained 24.6 cows.

Production

Average production for 1962 was 10,701 pounds of milk and 430 pounds of butterfat with an average test of 4.02 per cent. Completed milking periods numbered 17,290.

The effectiveness of our D.H.I.A. programme has been demonstrated previously by increases in both production and net returns to members. One phase in relation to the latter has been the increase in the number of cows in members' herds which have produced a minimum of a ton of fat so far in their lifetimes. In 1940 such cows numbered 417 and represented 5 per cent of the total cows on test; in 1962, while the number of tested cows had more than doubled, " ton of fat " cows increased four times to 2,557 and represented 13.2 per cent of total cows. This represents substantial savings in the cost of raising herd replacements.

The percentage of Holstein cattle in the Province continues to increase. In 1962, 68.4 per cent of D.H.I.A. tested cows were Holstein. The three other main dairy breeds continue to show corresponding decreases.

Average production for the various breeds is shown as Appendix No. 5.

Five thousand five hundred calves were identified as to parentage and birth date through our D.O.T. calf tags. Approximately 80 per cent of these were sired artificially.

Subsidy

Subsidy payments for the fiscal year April 1, 1962, to March 31, 1963, amounted to $58,565.

Reports

H.I.C. Stencil No. 90 was prepared, listing 928 cows with over 3,000 pounds of butterfat to their credit as at June 30, 1962. A total of 2,557 cows had produced a minimum of 2,000 pounds at this time.

Semi-annual reports on sires in artificial insemination centres continue to be sent out.

General

Inclusion of herds in the Vanderhoof area has brought the Central British Columbia route up to strength. There are 20 herds on test, involving 23 days' work in handling 617 cows.

The demand for additional testing continues strong; however, the two private owner-sampler testers have expanded their operations and are providing a worthwhile service to approximately 160 herds and 3,000 cows. D.H.I.A. supervisors have an additional 750 cows on owner-sampler.

Artificial Insemination

The percentage of identified A.I. animals on test continues to increase. In 1960, only 20 per cent of the total completed milking periods were made by such

animals; in 1961 this increased to 26.3 per cent and in 1962 to 30.2 per cent. This has come about mainly because of our compulsory calf-tagging policy, and could be further increased if a larger percentage of A.I. calves born in herds not on D.H.I.A. were identified by tag.

Any testing programme can only be effective for sire-proving purposes when the animals under test are identified.

Young Sire Programme

It is generally recognized that increases in the productive ability of dairy cattle can be most readily obtained through the use of artificial insemination. However, it has been shown that this is only true when a planned approach to sire use is undertaken by the centres. This approach must be based on a young-sire programme such as recommended by the British Columbia Advisory Committee on Artificial Insemination. A continuing effort must be made to get the centres to adopt one effective young-sire programme which would cover all breeds if the producer is to benefit from artificial insemination to the extent that can be expected.

R.O.P.-D.H.I.A.

Sixteen herds are being tested on the combined service when D.H.I.A. supervisors act as R.O.P. inspectors in herds containing both purebred and grade cattle. Only five herds are on R.O.P. and D.H.I.A. separately; all of these have more than the 10 grade-cow minimum. The continued close co-operation between the Federal and Provincial testing services is most gratifying.

Provincial-Federal meetings held in Ottawa last summer have resulted in increases in this co-operative effort, and it is expected that further benefits will develop. D.H.I.A. records from British Columbia, Ontario, Saskatchewan, and Manitoba are now being incorporated in the official R.O.P. sire appraisal reports, and it is anticipated that owner-sampler records will be used later on in preliminary reports on sires in artificial insemination centres.

Several problems exist at this time which will have to be solved before these latter records can be made available for sire proof purposes. Two of the main ones are some form of compensation to the owner-sampler testers for the extra work involved in preparing record reports and the provision of minimum supervision to see that such reports are properly prepared and accurate.

Breed-class Averages

It is proposed to introduce a set of breed-class average figures for crossbred dairy cattle in British Columbia. The figures will be based on the results of work done by Mr. G. Okumu, a graduate student at the University of British Columbia, from D.H.I.A. record material in British Columbia pertaining to the five-year period 1958–61.

Field Work

The Superintendent and two Inspectors carried out the total field work, as follows:—

Supervisor contacts	176
D.H.I.A. officials' contacts	53
Member visits	189
Certificates of production brought up to date	336
Other calls	139

Meetings	44
Talks	22
Herds check-tested	55

A short course was held at the University of British Columbia from December 2nd to December 14th, which five students attended, and four passed all examinations.

In this connection it is hoped that provision will be made in the new laboratory building at Abbotsford for adequate facilities to conduct our short course there.

ANIMAL PATHOLOGY LABORATORY

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

Disease problems pose a constant threat to efficient live-stock and poultry production, especially in those areas of British Columbia where intensive methods have been adopted. New problems have occurred, and no doubt will continue to arise; therefore, the need for veterinary advice, together with field investigation supported by laboratory diagnostic facilities, is increasing in importance.

The laboratory staff has participated in a field project concerning prevention and control in poultry of Newcastle disease, infectious bronchitis, P.P.L.O. infection, and avian encephalomyelitis. This project is being conducted by co-operation of numerous poultry-farmers, the British Columbia Department of Agriculture, and Connaught Medical Research Laboratories, Toronto, Ont., and will not be completed until the fall of 1964. Related to this project, a survey is being made of all hatchery supply flocks in British Columbia for evidence of " field " exposure to the diseases referred to and evaluation of vaccination practices.

We have co-operated with the Division of Laboratories, British Columbia Department of Health and Welfare, in a survey relating to the incidence of Salmonellæ, especially with respect to the evidence of same in specimens received in our laboratory.

Numerous field visits were made in connection with projects and disease problems encountered in specimens submitted for diagnosis. Personal interviews in the laboratory with farmers or their representatives concerning disease problems numbered 1,231. The number of live-stock and poultry owners who received assistance from the laboratory on the basis of specimens submitted totalled 816. The total number of specimens examined was 19,622. (*See* Appendix No. 6.)

Some problems of significance encountered in specimen submissions were:—

Species	Disease
Canary	Pseudotuberculosis.
Cat	Lungworm, myelogenous leukemia.
Cattle	Coli-bacillosis, clostridiosis, lungworm, mastitis, pasteurellosis, rhinotracheitis, salmonellosis, white muscle disease.
Chicken	Aspergillosis, chronic respiratory disease, encephalomalacia, encephalomyelitis, erysipelas, infectious bronchitis, Newcastle disease, pasteurellosis, salmonellosis, tuberculosis, vibrionic hepatitis.
Chinchilla	Enteritis, giardosis, pasteurellosis.
Dog	Hookworm, nocardiosis.
Goat	Lungworm.
Mink	Clostridiosis, distemper, phasmacytosis, pseudomonas, salmonellosis, steatitis, tuberculosis.
Monkey	Salmonellosis.
Rabbit	Pasteurellosis, vibrionic enteritis.

Sheep..... Parasitism.
Swine..... Mange, salmonellosis.
Turkey..... Air sacculitis, aspergillosis, entero-hepatitis, erysipelas, Newcastle disease, pasteurellosis, salmonellosis.

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

MARKETS AND STATISTICS BRANCH

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

SYNOPSIS

Decreases in both production and price levels in several sectors this year were offset to a degree by increases in others, resulting in a continuation of relatively buoyant conditions throughout the industry. Preliminary estimates place the total cash income from the sale of farm products very near the all-time record established in 1962.

The index of farm prices dropped 5 points during the year however, reflecting a softer tone in returns from live stock and some fruits and vegetables. The annual high of 286.3 (1935–39=100) reached in July was off 6.2 points from the level established 12 months earlier. Despite this, increases in business investment and consumer spending in the latter half of the year contributed a stabilizing effect on the market generally, so that those declines which did occur were for the most part of a minor nature.

FEEDS

A bumper Canadian grain crop produced a sharp rise in domestic supplies of feed grains in the latter half of the year. As a result, prices tended to decline shortly after harvesting ended in October. Feed wheat dropped $2 per ton, oats $3, and barley $5, while prepared feeds declined as much as $7.

As usual, hay and fodder supplies were sufficient in most areas to maintain steady prices. Shortages created by drought conditions in the Peace River District were overcome by imports from other areas with financial assistance provided by the Government.

LIVE STOCK

Price declines in beef highlighted the live-stock market picture in 1963. A softer tone had already developed early in the year, and this continued until midsummer, when prices firmed upward briefly by $5. A sharp decline in cattle exports to the United States, from 30,134 head in 1962 to just under 16,000 this year, resulted in a build-up of domestic market supplies to the point where prices dropped again by about $5. About 6,300 cattle and calves from British Columbia moved through Alberta auctions.

Total cattle numbers rose by 6 per cent during the year to a total of 458,000. This was brought about by increases in the beef population, offsetting a decline in numbers of dairy cattle, and indicating a steady upswing in numbers of beef cattle held back on farms. Much of this hold-back consists of heifers and steers which under ordinary conditions would have been marketed as feeders.

The lamb market remained strong throughout the year at levels above those realized both in 1962 and the five-year 1958–62 average. Net live sales amounted to 32,500 head during the year, leaving the basic sheep flock at 45,000, down 1,000

head from the year-end 1962 total. An increase of 3,000 in lamb numbers brought the total sheep and lamb population figure up to 58,000 however.

Hog prices, which had been relatively high in the first half of the year, fell off by about $3 in the autumn, but were still well above the averages established during the preceding five years.

At mid-year the Provincial hog population was estimated at only 37,000 head, the lowest level in over 40 years.

For the second consecutive year a slight rise was recorded in the numbers of horses on farms, after a steady downward trend since the war years. The increase is attributed to the growing popularity of light horses rather than the heavy draught breeds.

POULTRY AND EGGS

Poultry-meat production exceeded 45,000,000 pounds in 1963, an all-time record. Prices held up well throughout the year for all classes, with the exception of broiler chicken, which fell off 4 cents a pound by December. Output of turkeys again declined, this year by 15 per cent from 1962 levels.

Placement of broiler chicks rose almost 13 per cent to 10,508,000 during the year.

Total poultry numbers on farms were placed at more than 6,250,000 at mid-year, the highest figure on record. Of this number, 5,770,000 comprised hens and chickens.

New records were also established in commercial eggs as production rose nearly 5 per cent to a total of 45,420,000 dozen for the year. Coupled with this was a significant increase in prices, the weighted average for the 12-month period being 33.8 cents per dozen, as compared with 30.9 cents in the preceding year.

DAIRY PRODUCTS

The downward trend in milk production continued this year, off 2 per cent at an estimated 881,000,000 pounds as the Province's dairy-cow population declined by 1,000 head to a total of 90,000.

Fluid sales increased to more than 506,000,000 pounds, an increase of approximately 4 per cent over the 1962 total. The average farm value for all milk has been placed at $4.45 per hundredweight for the year.

Output of creamery butter fell off sharply to only 5,000,000 pounds, but cottage cheese production again rose by 3 per cent to a total of 6,682,000 pounds for the year. Cheddar cheese manufacture remained relatively unchanged at slightly less than 1,000,000 pounds, while ice-cream increased fractionally to 4,654,000 gallons.

FRUIT

A 9,000,000-box apple crop provided the principal market feature in the fruit industry this year. This was the heaviest crop since 1946, when the total yield reached 10,000,000 boxes.

By the year-end, sales to the fresh market totalled 3,300,000 boxes, a gain of 16 per cent over the 1962 crop sales figure. Of this amount, 1,559,800 boxes were sold in Western Canada, 240,000 to Eastern Canada, 858,000 to the United States, and 453,000 to the United Kingdom. Close to 200,000 boxes were exported to other offshore markets.

Prices were slightly below those realized during the same period in 1962, although the United Kingdom and other offshore markets were firm.

Pear production increased almost 50 per cent in 1963, but all other tree fruits, with the exception of crab-apples, registered declines. Apricots were down sharply to only 259,000 crates, less than one-third of the 1962 crop.

The first of several controlled-atmosphere storage plants to be erected in the Okanagan Valley was put in operation this year at Kelowna.

Production of small fruits, including grapes, was up 25 per cent over 1962. The strawberry crop was only slightly heavier, but yields of raspberries, loganberries, blueberries, and grapes were well above those of the preceding year. Prices held close to or slightly above 1962 levels as demand continued firm, particularly for loganberries and grapes.

Loganberries were again shipped to the United Kingdom, and along with grapes were again in strong demand for wine-making purposes.

VEGETABLES

Total acreages in vegetable crops remained virtually unchanged this year, gains in some being offset by decreases in others. Production was up about 10 per cent, due primarily to increased yields of cabbage, onions, and turnips.

Onion prices were up $12 per ton, but fresh tomatoes were down slightly as late maturity forced offerings on to the market later than usual.

Growers of tomatoes for processing were offered two options this year: contracting the entire crop at prices ranging from $41.50 to $46 per ton, depending upon the percentages of No. 1 grade shipped, or $30 per ton for shipments containing 60 per cent or more No. 1's, with culls excluded, where the grower shipped to both fresh and processing markets. Under this second option, shipments containing less than 60 per cent No. 1's were worth only $20 per ton.

FIELD CROPS

Drought conditions and a decrease in harvested acreage in the Peace River District combined to produce a sharp drop in grain yields this year. Total production amounted to only 7,398,000 bushels as compared with the 1962 total of over 11,000,000 bushels. The average wheat yield was estimated at only 19.1 bushels per acre, or about two-thirds of normal.

Forage-crop seed production was up 55 per cent at almost 5,000,000 pounds, but still well below the levels attained prior to 1962. Most of this year's increase was contributed by sharply higher harvests of creeping red fescue and sweet clover seed. Prices were generally higher than those of the previous year.

Potato acreage was down about 5 per cent, but the yield of late varieties was up as a result of favourable growing conditions during the latter part of the crop season. Prices were steady throughout the fall season at $4 to $6 per ton over 1962, in spite of heavy imports from Alberta.

MISCELLANEOUS

Wool production this year reached a total of 364,000 pounds from shearings of 47,300 head, a decline of 6 per cent from 1962. Prices held steadily at 31 cents per pound before addition of deficiency payments.

Some 24,000 colonies produced an average of 75 pounds of honey each to bring this year's total yield to 1,800,000 pounds. Producer prices indicated a firmer trend as demand continued upward during the year.

Strong bidding for ranch mink again featured the raw-fur auctions in Vancouver, total sales being in excess of $1,000,000.

PLANT PATHOLOGY BRANCH

W. R. FOSTER, M.SC., PROVINCIAL PLANT PATHOLOGIST

Plant diseases were of minor importance to the economy of agriculture in British Columbia in 1963. The following diseases caused moderate damage: (1) Early blight and mosaic of tomatoes, (2) red stele root-rot and virus in strawberries, (3) fire blight of pears, and (4) little cherry.

DISEASES

FIELD CROPS AND VEGETABLES

Bacterial Ring-rot of Potatoes.—British Columbia continues to have much less ring-rot than the rest of Canada. Five growers' potatoes are under detention—four in the Fraser Valley and one at Creston.

Bacterial Wilt of Alfalfa.—The growing of the resistant variety Vernal has reduced the incidence from severe to slight. A new resistant variety, Beaver, is recommended in districts where the winter weather is too severe for Vernal.

Early blight of tomatoes continues to be the major problem in the Northern Okanagan. Sprays have been only partially successful.

Leaf mould of tomatoes caused less damage in greenhouses than usual. The variety Vantage V595 was resistant and appears to be suitable for the trade. Vantage V595 is also resistant to a disease called blotchy ripening.

Mosaic and Streak of Tomatoes.—These virus diseases are widespread in greenhouses at the Coast and in fields in the Okanagan. A demonstration in a greenhouse near Victoria proved that these diseases can be eradicated by adhering to the following control measures: (1) Sanitation, including thoroughly cleaning the inside of the greenhouse with a solution of formaldehyde and washing hands with soap and water before handling plants; (2) sterilizing the soil with steam; (3) treating the seed by the hot-water method; and (4) planting only healthy plants.

Onion smut is widespread in the Kelowna area. Recommended seed treatments adequately control this disease.

TREE FRUITS

Apple Scab.—Incidence of scab was slight in the Interior. The application of an eradicant fungicide after an infection period gave economical control.

Brown rot of stone fruits was severe in the Kootenays. There was a sudden increase in the Okanagan which caused slight to moderate losses in cherry shipments. In the past, brown rot has not been a problem in the Okanagan.

Coryneum blight of stone fruits caused slight to moderate damage. Ferbam, Ziram, and Maneb were found to injure the wood and buds in current year's growth. To prevent twig infection, a fixed copper fungicide applied in September after harvest is now recommended instead of Ferbam, Ziram, or Maneb.

Fire Blight of Pears.—The incidence has continued to increase in some districts in the Okanagan during the last three years.

Collar-rot of fruit-trees continues to be a problem in a number of young orchards in the Okanagan. Apple, peach, and cherry trees are most affected.

Perennial Canker of Apple.—Interplanting of young trees among old "cankered" trees has resulted in severe infections. Young trees do not become resistant until after they have been planted for three to four years.

Trellis Rust of Pears and Junipers.—An eradication programme started in April in the Chilliwack area appears to have been remarkably successful. In September, only one lesion was found on one leaf on three different pear-trees within 200 yards of the original infestation. This programme will be continued during April and September, 1964. The eradication programme of the first outbreak in North America, in Victoria and district, continues. The outbreak is much more widespread and established than is the one at Chilliwack and is still far from being eradicated, although there has been a further reduction in the amount of disease. Preliminary tests on the effectiveness of Acti-Dione on the rust on junipers are promising. Junipers in the affected area will be sprayed with Acti-Dione BR next April.

SMALL FRUITS

Virus in Strawberries.—A sudden increase in the incidence of virus diseases was responsible for a shortage of certified strawberry plants. Certified strawberry plants should be grown in areas where they can be isolated, or a sufficient distance from commercial strawberry plants so as not to become infected.

ORNAMENTALS

Collar-rot of Lawson's Cypress.—This disease continues to be serious at the Coast, particularly where there is poor drainage.

Verticillium Wilt of Chrysanthemums.—The incidence was higher than usual.

REPORT OF POULTRY BRANCH, 1963

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

Approximately 65 per cent of British Columbia's poultry industry is located in the Municipalities of Surrey, Langley, Matsqui, and Sumas; a further 15 per cent is on Southern Vancouver Island; and the remaining 20 per cent is concentrated around the centres of population throughout the Province. The farm flock of 200 to 300 birds has largely disappeared and has been replaced by flocks just large enough to supply the farm family's requirements and by the specialized commercial producer.

The farm value of the poultry products produced has shown a steady growth, as is indicated in Table I. It is exceeded only by those of Ontario and Quebec.

Table I.—Income in Kind and Farm Value of Poultry Products[1]

	Cash Income			Income in Kind			Total Farm Value
	Eggs	Poultry Meat	Total	Eggs	Poultry Meat	Total	
1959	$12,983,000	$11,749,000	$24,732,000	$742,000	$376,000	$1,118,000	$25,856,000
1960	13,573,000	11,776,000	25,349,000	653,000	319,000	972,000	26,326,000
1961	14,882,000	11,019,000	25,901,000	581,000	240,000	821,000	26,727,000
1962	15,329,000	12,221,000	27,540,000	575,000	325,000	900,000	28,443,000
1963	16,868,000	12,990,000	29,858,000	560,000	290,000	850,000	30,708,000

[1] 1959 to 1962, Dominion Bureau of Statistics; 1963, British Columbia Department of Agriculture estimate.

The three major factors involved in the sharp rise in the farm value for commercial eggs in 1963 were (*a*) some increase in flock size, (*b*) increased production per bird, and (*c*) an increase in the weighted average price received.

Table II shows the approximate weighted average prices for major poultry products for the past five years and compares the 1963 price with the average for the period given.

Table II.— Weighted Average Producer Price

	1959	1960	1961	1962	1963	1963 as Percentage of 5-year Average
Eggs	32.1	31.4	32.1	30.9	33.8	105.4
Chicken	22.2	21.4	17.9	23.0	21.9	102.8
Fowl	12.8	13.9	12.7	11.0	12.7	99.2
Turkey	24.0	31.1	26.1	26.0	25.4	95.8

COMMERCIAL EGGS

Commercial egg production in 1963 established new levels and exceeded the 1962 production by about 4 per cent. Peak production occurred during the second week in December, when over 6,000,000 eggs were handled by registered grading-stations. Total production during 1963 was approximately 45,300,000 dozen, as compared to 43,400,000 dozen in 1962.

There has been some activity in integrated farm development, with several farm groups being involved in the manufacture of feed, the production of chicks, the growing of started pullets, and the production of commercial and hatching eggs. Other large producers have entered the marketing field, while still others have added facilities for the manufacture of their feed requirements. It is probable that this form of integration will continue as the major producers attempt to gain control of more of the factors that are involved in their businesses. (For production and prices *see* Appendices Nos. 12 and 13.)

POULTRY MEAT

Out of a total of 39,000,000 pounds of poultry meat processed in registered plants in 1963, 25,500,000 pounds, or 65 per cent, were fryers and light roasters. Steady prices at fairly high levels during 1962 and the first nine months of 1963 contributed to a build-up of broiler production to levels above domestic requirements. Sharp cut-backs in broiler-chick placements during October and November resulted in surplus supplies of hatching eggs. The marketing of these eggs through regular commercial channels caused severe losses to the producer.

Turkey production continued its long-term downward trend, with the total output 15 per cent below the 1962 level. (For production and prices of poultry meat *see* Appendices Nos. 14 and 15.)

FLOCK APPROVAL

The annual routine pullorum testing of all poultry breeding flocks continues to be one of the major programmes of this Branch. Thirty-four out of the 247,828 birds tested reacted positively to the rapid field test. All positive reactors to the field test were submitted to the Provincial Pathology Laboratory for bacterial examination, with negative pullorum findings. Table III is presented to show the volume and trend of this work during the past four years.

Table III.—Poultry-testing Comparisons

	1960	1961	1962	1963
Chickens Tested				
Number of premises	125	148	128	127
Number of birds tested	305,468	298,841	228,816	247,828
Egg-production type	108,020	119,005	90,736	98,411
Meat-production type	115,062	141,141	135,353	148,237
Retest	74,273	37,676	2,371	----------
Reactors	284	340	152	34[1]
Commercial layers	7,829	679	204	1,146
Turkeys Tested				
Number of premises	13	7	7	5
Number of birds tested	12,267	8,281	9,584	3,349

[1] All negative on bacterial examination.

DISEASE

Respiratory diseases and the leucosis complex continued to be the most important causes of loss of production and mortality in commercial flocks. While effective vaccines for the control of the major respiratory diseases were readily available, many producers have been reluctant to use them routinely because of complicating side effects. In order to demonstrate the effectiveness of the vaccines and other control measures, this Department, in co-operation with the Connaught Medical Research Laboratories of the University of Toronto, supported a voluntary demonstration project involving approximately 200,000 chickens on 32 separate farms. This project, initiated in April, 1963, will continue until the end of September, 1964.

Approximately one-half of the birds and farms involved in the programme are being used as controls with which the treated group can be compared. All vaccines and other required medication are being supplied and administered to the treated group by the supporting organizations free of charge. The value of the recommended programme will be assessed on the basis of the economic, serological, management, and production records of both groups at its conclusion.

As an extension of this programme and to provide the required background information, the immune status of all breeding flocks to infectious bronchitis, Newcastle disease, epidemic tremors, and the level of P.P.L.O. infection has been determined. This study has clearly indicated the urgent need for routine control measures in breeding flocks in order that the chicks produced may have a uniform level of parental immunity and freedom from inherent disease-producing organisms.

Vaccine for the control of epidemic tremors was made available in Canada for the first time during 1963. Distribution of this vaccine is under the control of the Department.

The sale of vaccine for avian diseases was up sharply in 1963, as is indicated by Appendix No. 16.

The need for extended diagnostic facilities and services continues to be one of the industry's major concerns.

FARM-MANAGEMENT STUDY

Commercial Eggs

The study of farm-management methods and the relationship between management methods and cost of production has become an important and rewarding part of this Branch's general extension programme. Using rate of lay as a guide, the

farms participating in this programme show an advantage of approximately 12 per cent over the Provincial average. It is unfortunate that more emphasis cannot be placed on this valuable programme due to the lack of trained staff.

Broilers

In co-operation with the British Columbia Broiler Association, cost of broiler production records have been obtained on 70 commercial market flocks involving approximately 500,000 birds. The information thus obtained is used by the Broiler Association for statistical purposes and by this Branch to improve management practices.

A more detailed study of 17 broiler-farms was supervised by this Branch, and the following economic factors were determined:—

Broiler-farm Study

1. Size of farm: 10 acres (average), 1 to 40 acres (range).
2. Building capacity: 6,000 (average), 1,000 to 140,000 (range).
3. Feed cost: $89 to $102 per ton.
4. Financing: Only 1 out of 17 pays cash for feed; the other 16 pay feed bills from proceeds.
5. Production statistics (average): Age to market, 63 days; weight, 3.63 pounds; per cent livability, 97.6; feed conversion, 2.48 pounds; grade, 6.71 per cent B's, 1.25 per cent rejects.
6. Cost statistics, per pound of meat produced in cents—

	Cents
Feed	11.80
Chick	3.95
Vaccine	.08
Litter	.14
Brooding	.35
Electricity	.65
Cartage	.15
Total	17.25[1]

[1] Labour, depreciation, interest on investment, taxes, and other fixed costs are not included in this figure.

Broiler Hatching Eggs

The production of hatching eggs for broiler-chick production is a small but important part of the poultry industry. Approximately 150,000 birds are used for this purpose. At the request of and in co-operation with the Broiler Hatching Egg Producers' Association, a survey of the cost of producing broiler hatching eggs was conducted. The following average figures were arrived at from information given by eight producers:—

Broiler Breeder Survey, June, 1963

Per cent mortality	17.7
Age when marketed ... months	15.4
Hatching eggs per bird	111
Commercial eggs per bird	15

Income—		
Hatching eggs	$6.62	
Commercial eggs	.31	
Fowl	1.24	
Other	.05	
Total income		$8.22
Expenses—		
Rearing	$2.27	
Laying-house	4.27	
Miscellaneous	.68	
Total expenses		7.22[1]
Income less expenses		$1.00

[1] Labour, depreciation, interest on investment, taxes, and other fixed costs are not included in this figure.

CONSOLIDATION OF OFFICES

Early in the year, approval was given to the transfer of the three Mainland inspectors and one clerk-stenographer to the office of the Random Sample Test Station in Abbotsford. The purpose of this move is to develop a service centre in the area of the greatest concentration of poultry and to provide the qualified personnel with facilities necessary to carry out practical research and demonstration projects.

When the new laboratory and additional office space is available for use, it is the intention of this Branch to establish a training programme for commercial poultry servicemen in order that they may supplement the work of our present staff.

BRITISH COLUMBIA RANDOM SAMPLE POULTRY TEST

The Random Sample Test Station has continued to perform the functions for which it was designed; that is, to compare the inherent productive capacity of the various breeds and strains of poultry exposed for sale in this Province. Reports of the results of this work have been distributed to all entrants involved and to all interested persons in British Columbia. Copies of these reports have also been sent, on request, to almost all countries in which poultry is a significant part of agriculture.

Minor changes in the interior arrangements of the buildings have made it possible to include the testing of 40 new experimental strains of Leghorns, developed by the Canada Department of Agriculture, and to initiate experimental projects designed to answer some of the producers' production problems, and further work of a similar nature is presently in progress.

In co-operation with the Department of Poultry Science, University of British Columbia, an I.B.M. programme for processing the data has been evolved. While this change has had little effect on the labour required to record the raw data, it has substantially reduced the time necessary to tabulate and prepare the information for presentation.

BONDING AND LICENSING OF EGG-GRADING STATIONS

Regulations under the *Poultry and Poultry Products Act,* chapter 291 of the *Revised Statutes of British Columbia, 1960,* approved by Order in Council No. 1177 on May 14, 1963, were implemented, and 49 registered egg-grading stations that purchase ungraded eggs from producers have been licensed.

BRITISH COLUMBIA POULTRY CONFERENCE

The annual British Columbia Poultry Conference, initiated by this Department in 1956 and which was continued until 1960, was reinstituted by industry groups. Developed on an educational and promotional theme, the two-day conference was held on October 23 and 24, 1963, at the Cloverdale Fair Grounds. Approximately 250 persons registered for the sessions.

MEETINGS AND ORGANIZATIONS

Staff members attended the regular meetings of the following organizations: British Columbia Poultry Industries' Council, British Columbia Egg Producers' Association, British Columbia Broiler Growers' Association, British Columbia Rabbit Breeders' Association, British Columbia Produce Association, British Columbia Baby Chick Association, British Columbia Broiler Hatching Egg Producers, Pacific National Exhibition, Lower Vancouver Island Poultry Producers' Association, and others related to the poultry industry.

In October discussions were held with officials of the Production Service, Canada Department of Agriculture, as an initial step in the re-establishment of poultry breeding as part of the British Columbia poultry industry. These discussions indicated the need of joint participation by government and industry in order to overcome the advantage presently held by the large industrialized poultry-breeding organizations. Further discussions are planned to develop a co-ordinated programme.

THE SOIL SURVEY BRANCH

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

In 1963, field surveys in the Okanagan Valley consisted of the Lakeview Irrigation District extension proposal, the City of Penticton irrigation system, and the Kaleden Irrigation District. In the Lower Fraser Valley, a survey of Matsqui Municipality was completed, and a start was made on Langley Municipality. The pioneer soil survey of the Thompson River valley was held back by other activities; however, a part of this survey, the Eagle River valley, was mapped between Sicamous and Three Valley Lake, and field work was extended in the Thompson Valley downstream to Monte Creek. Development of a soil-classification procedure for forestry was continued, and soil-capability classification for the A.R.D.A. programme started.

An interim report on the Ashcroft-Savona area in the Thompson Valley was completed. A meeting of the Soils Advisory Committee, several meetings of subcommittees, and a Soil Science Workshop were held and reported. A meeting of the Reclamation Committee in the Okanagan Valley took place in July, and was reported in Brief 42 in September. The report " Soil Survey of the Kettle River Valley " was revised and sent to press. Two members of the staff were engaged in soils extension work. The forms of phosphorus in certain British Columbia soils were investigated.

LAKEVIEW IRRIGATION DISTRICT EXTENSION PROPOSAL

The survey was undertaken in May as part of a general investigation to determine the feasibility of the proposed extension for development. A total of 2,235 acres was classified, of which 1,300 were found to be arable. The soils are derived

chiefly from coarse-textured glacial outwash and in part from fine-textured glaciolacustrine deposits. Sub-groups of Brown, Dark Brown, Dark Gray, Gray Wooded, Gleysolic, and Regosolic soils were found. The irrigation-water requirements and a classification of the soils according to suitability for irrigation were reported in Reclamation Committee Brief 42. A soil map and report describing the soils in detail are in progress.

PENTICTON IRRIGATION SYSTEM AND KALEDEN IRRIGATION DISTRICT

Soil surveys of the Penticton and Kaleden areas were undertaken in June and July. In the area of the Penticton irrigation system, 3,084 acres were mapped, of which 2,492 were classed as arable. In the Kaleden Irrigation District, of 863 acres classified, 643 are arable.

The bench soils of the Penticton area are derived from glaciolacustrine silts and sandy and gravelly outwash. At lower elevations the coarse- to fine-textured fans of Ellis and Penticton Creeks are occupied chiefly by the City of Penticton, and most of the remainder is subdivided.

In the Kaleden Irrigation District the higher ground is occupied chiefly by kame terraces and kettled outwash, from which sandy and gravelly soils are derived. A few acres of soils developed from fans. Glaciolacustrine silts are unimportant. In both Penticton and Kaleden areas the Brown soils are most extensive; minor areas are occupied by Dark Brown, Regosolic, and Gleysolic soils. Agricultural production in both areas is confined almost entirely to tree fruits.

The recommended water requirements of the soils for sprinkler irrigation and their classification according to suitability for irrigation were reported in Reclamation Committee Brief 42. Soil maps and an interim report describing the soils in detail will be completed early in 1964.

MATSQUI AND LANGLEY MUNICIPALITIES

The soil survey of Matsqui Municipality began in 1962. It was completed with detailed classification of about 20,000 acres in 1963. Detailed work in Langley Municipality involved classification of about 25,000 acres in 1963. This work will be continued in 1964, and when completed the entire area on the south side of the Fraser River from Rosedale, east of Chilliwack, to the Strait of Georgia will have been classified in detail.

The uplands soils in the eastern part of the mapped area are derived from a shallow layer of loess which overlies glacial outwash, glacio-marine deposits, and glacial till. In the western section, loess is absent or unimportant and the upland soils developed entirely from the deposits of glacial origin.

The soils were assigned chiefly to the Acid Brown Wooded and Concretionary Brown groups. There are minor areas of Minimal Podzol, Gleyed Acid Brown Wooded, Gleyed Ortstein Podzol, Rego Humic Gleysol, and Muck groups of soils. A report and soil map of Matsqui Municipality, including Sumas Mountain, will be prepared during the winter of 1963/64.

EAGLE RIVER VALLEY

When undertaking regional surveys, it is essential to include minor areas, such as the bottoms of tributary valleys, because these areas are too small for separate reports suitable for publication. Thus the Eagle Valley was included in the Thompson Valley survey. This was a survey of the valley-bottom from Sicamous to Three

Valley Lake, including the north end of Wap Creek valley. About 20,550 acres were classified on a scale of 2 inches to a mile.

The valley filling materials are supplied by tributaries, which have carved steep channels in the valley sides. Much coarse material has been brought down at the time of the freshets, to form large stony and gravelly deposits at entry points. Such deposits form dams which slow the Eagle River, causing it to meander and deposit its load of fine material, also supplied by the tributaries, between the dams thus formed.

The Eagle Valley is one of the more humid parts of the Interior, where Podzols can develop. These soils contain magnetic-iron concretions at the higher elevations. Other soils found in the area are Gray Wooded types on the higher deposits of the Eagle River that have fine texture; Regosols occur on the more recent ones. The Gray Wooded soils on alluvial terraces between Sicamous and Malakwa are being cleared for farming.

THE THOMPSON VALLEY SURVEY

This survey, subject to priorities, has been progressing since 1961. Concurrently, at the request of this Department, a survey of surficial deposits by the Geological Survey of Canada is also progressing.

About 6,600 acres were classified north of Celista, in the vicinity of Hilna and Onyx Creeks. An additional 7,650 acres were surveyed on the north side of the Thompson River between Chase and Monte Creek. The soil survey of the Thompson River valley, eventually to include the entire drainage basin, now extends from Armstrong to Monte Creek.

FOREST-LAND CLASSIFICATION

Three weeks were spent on forest-land classification by two soil surveyors in co-operation with representatives of the Canada and Provincial forestry departments. The project area is located about 10 miles north-east of Chase at 4,500 feet elevation. At this elevation, drainage is the factor which governs soil-profile development. The soils were Podzolic and Gleysolic, and were mapped at three levels of detail. This was done to determine how much useful information for forest management would be available at each mapping scale. A report and maps will be prepared in the winter of 1963/64.

SOIL-CAPABILITY CLASSIFICATION

Soil-capability classification is one of several interpretive groupings that can be made from soil-survey information. In this classification the mineral soils are grouped in seven classes according to their suitability for agriculture. The soils of the first three classes can support sustained production of all climatically suitable crops. The fourth class is marginal for this purpose, and the fifth and sixth classes are suitable only for permanent pasture. There is a seventh class for soil and land types unsuitable for permanent pasture or for cultivated agriculture.

LOWER FRASER VALLEY

During the 1963 field season all areas in the Lower Fraser Valley which have been reclassified were examined and given a soil-capability classification. This amounts to about 250,000 acres. Similar classification of remaining areas will be undertaken along with soil surveys still to be undertaken.

Okanagan Valley

In 1963, soil-capability classification was applied to the area between Kelowna and the 49th parallel, which amounts to about 200,000 acres. The North Okanagan will receive similar attention early in 1964.

During the winter of 1963/64, preparations will be made to extend soil-capability classification to all other areas classified by this Branch in the past. It is hoped that 1964 field work will complete the project.

SOIL CONSERVATION

Soil-testing for abnormalities in samples submitted by Okanagan farmers, district officials, and others was continued. Some 830 soil samples were examined for alkali. Twelve per cent contained black and 21 per cent white alkali in concentrations harmful to plants. Twenty-five samples of water intended for irrigation were tested; 16 per cent of the samples were too alkaline for the purpose.

About 60 farm visits were made in the Okanagan Valley in connection with land-drainage problems. Plans were prepared for 8,436 feet of drainage-works, which were installed by December 1st. Investigations prior to developing plans for an additional 3,200 feet of drains are in progress.

In the Lower Fraser Valley, 33 farms, having a combined area of 1,294 acres, were surveyed for drainage requirements. Drainage systems designed for the surveyed area total about 424,785 feet of buried tile and 56,805 feet of open ditches.

Observations as to the depth and fluctuations of the water-table were made at 12 locations in order to determine the effectiveness of sub-surface drains. Hydraulic conductivity measurements were made in conjunction with water-table studies to evaluate the drainage requirements of different soils.

Crop yield data from the Ladner drainage plots were obtained through co-operation with the Agricultural Development and Extension Branch, Field Crops Branch, Canada Department of Agriculture, and the University of British Columbia. The results show that yields increase with effective drainage. Oat and potato yields on land drained at 80, 40, and 20 feet tile spacings averaged 34.3 and 60.9 per cent higher than on undrained land. In some cases the increased production after drainage can pay the cost of drainage in one year if high-value crops are grown.

An inventory of existing drainage systems was completed in Delta Municipality. This survey shows that less than 25 per cent of the municipality has properly functioning drains.

A record was started of the location and time of installation of future drainage systems. Methods of controlling ditch-bank erosion were studied, as were sedimentation in drains and the locating and clearing of obstructions. The effectiveness of sub-surface irrigation was also studied.

In the Okanagan Valley the demand for advisory assistance in regard to farm irrigation continued at a high level. About 60 farm visits were devoted to checking sprinkler irrigation systems, application rates, irrigation intervals, and other soil-water relationships. Co-operation was continued with the Canada Research Station, Summerland, with officials of irrigation districts and the Agricultural Development and Extension Branch, the emphasis being on the scheduling of water applications in the Oliver-Osyoyoos area and more general work in the North Okanagan.

Advisory assistance was given to the Department of Public Works, the South Okanagan Health Unit, the Land Inspection Division, and the Water Rights Branch. Lectures were given to farm groups, soils clubs, and irrigation district officials. This

Branch participated in a study of the Lillooet-Lytton-Spences Bridge region as to its suitability for the commercial production of grapes.

LABORATORY

Laboratory analyses in 1963 included samples collected in Matsqui and Langley Municipalities of the Lower Fraser Valley in connection with the soil surveys. Analyses were made for soil surveys of samples collected in the Eagle River valley, Chase to Pritchard, Celista, and in the Penticton, Kaleden, and Lakeview Irrigation Districts.

The fertility status of some British Columbia soils was investigated to the extent of about 7,000 chemical determinations, the primary emphasis being on the behaviour of soil phosphorus. Chemical properties of soils, their interaction with phosphorus and its availability to plants, were studied with the help of an electronic computing-machine at the University of British Columbia.

The distribution of inorganic phosphorus and the forms in which it occurs was found to differ with the soil group. In the Regosolic and Gleysolic soils of the Fraser River flood-plains, phosphorus occurs chiefly as calcium phosphate, though this form is rare under acid soil conditions elsewhere. In contrast to alkaline soils of the Interior, the calcium phosphate in the acid flood-plain soils of the Lower Fraser Valley is an important source of phosphorus to many crops. This, in part, may explain discrepancies in plant response to additions of lime and phosphorus in that area.

The slightly acid to neutral soils of the Interior and the acid upland soils of the Lower Fraser Valley and Peace River District contain high amounts of phosphorus in the form of aluminum and iron phosphates. It was found that the fractions available to plants, where such forms occur, require detection by the use of mild acid fluoride in order to get meaningful correlation.

The nutrient status of soils was found to vary so much within small geographic areas that economical fertilizer applications are not practicable unless soil analyses geared to the soil groups is undertaken.

The relationship between various soil analysis procedures, forms of phosphorus, plant uptake of phosporus, related crop yield, and other chemical and physical properties of soils were studied. Various procedures were found to be useful when related to soil groups. Any single method when applied without discrimination results in the improper use of fertilizers.

It was found that the Bray P_1 method, with modifications, could be adopted to various soils in this Province when related to the appropriate soil groups. Some of the criteria for comparison of the soil groups with one another were established.

APPENDICES

APPENDIX No. 1

Calfhood Vaccinations under Federal-Provincial Brucellosis Control

Period	Total Vaccinations
July 15, 1950, to June 30, 1951	18,929
July 1, 1951, to June 30, 1952	24,178
July 1, 1952, to June 30, 1953	29,605
July 1, 1953, to June 30, 1954	34,105
July 1, 1954, to June 30, 1955	36,815
July 1, 1955, to June 30, 1956	36,412
July 1, 1956, to June 30, 1957	39,230
July 1, 1957, to June 30, 1958	47,087
July 1, 1958, to June 30, 1959	58,896
July 1, 1959, to June 30, 1960	59,945
July 1, 1960, to June 30, 1961	65,450
July 1, 1961, to June 30, 1962	67,706
July 1, 1962, to June 30, 1963	65,971
Totals	584,329

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

APPENDIX No. 2

Dairy-farm Inspections under Milk Industry Act

District	Number of Dairy-farm Inspections	Number of Dairy-farms Issued Notice of Cancellation by Inspectors		Number of Approved Dairy-farms	
		Raw	Fluid	Raw	Fluid
East Kootenay	100	1	6	2	36
West Kootenay	110	4	8	5	27
North Okanagan	608	1	4	2	125
South Okanagan	345	1	3	1	62
Central British Columbia	198	2	9	4	129
Fraser Valley	2,397	----	82	----	1,851
Vancouver Island	574	2	7	26	225
North Bend	4	----	----	1	-------
Pemberton-Sechelt	17	----	2	2	3
Sandspit	2	----	----	1	-------
Totals	4,355	11	121	44	2,458

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

APPENDIX No. 3

List of Artificial Insemination Centres and Reported First Services in 1962

Name of Centre	First Services
Alberni Farmers' Institute	172
Armstrong Sub-unit, British Columbia Artificial Insemination Centre	4,555
British Columbia Artificial Insemination Centre	45,084
Bulkley Valley Cattle Breeders' Association	311
Chilliwack Artificial Insemination Centre	15,467
City Dairy Farms Ltd.	181
Comox Valley Artificial Insemination Club	706
Cowichan Agricultural Society and Farmers' Institute	3,382
Creston Valley Frozen Artificial Insemination Club	609
Dawson Creek and District Dairy Producers' Association	219
Giscome Farms	125
Guthrie, John A.	43
Kamloops Artificial Insemination Centre	343
Kelowna District Artificial Insemination Association	725
McBride Livestock Improvement Association	96
Nechako Valley Dairymen's Association	423
Nelson and District Artificial Insemination Centre	204
Newbrand, Emil	25
North Peace Artificial Insemination Service	192
Prince George Artificial Insemination Centre	216
Quesnel Artificial Insemination Association Centre	196
Rubis, J., Jr.	107
Saanich Artificial Insemination Club	602
Saltspring Island Artificial Insemination Club	116
Urquhart, James A.	47

APPENDIX No. 4

Cattle and Hide Shipments, 1963

District	Cattle	Hides
Cariboo—		
Quesnel	3,099	346
Williams Lake, Alexis Creek	18,666	269
Clinton, Lac la Hache, 100 Mile House, Graham Siding, Bridge Lake, Lone Butte	4,218	29
Lillooet, Pavilion, Bralorne, Pemberton	730	.....
Bella Coola	20	.....
	26,733	644
Kamloops, Nicola, etc.—		
Kamloops, Chase	30,035	855
Merritt	12,917	254
Ashcroft, Lytton, etc.	10,206	595
Salmon Arm	1,776	791
	54,934	2,495
Okanagan—		
Vernon, Lumby, Falkland	7,932	532
Armstrong, Enderby, Sicamous	4,073	319
Kelowna	3,456	2,850
Penticton, Summerland	735	70
Oliver, Osoyoos	1,379	274
	17,575	4,045
Similkameen—		
Princeton, Keremeos, Copper Mountain	8,543	183
Grand Forks, Greenwood	2,501	302
	11,044	485
South-eastern British Columbia—		
Rossland, Crescent Valley	283	515
Nelson, Creston, etc.	2,022	679
Cranbrook, Fernie, etc.	7,426	481
Invermere, Golden	1,285	80
	11,016	1,755
Central British Columbia—		
Prince George, Vanderhoof	2,981	133
Smithers, Giscome, etc.	2,719	232
Burns Lake	2,158	52
	7,858	417
Peace River—		
Fort St. John	5,151	234
Dawson Creek	13,967	2,098
Atlin, Fort Nelson, Cassiar, Chetwynd, Hudson Hope	36	.....
	19,154	2,332

Totals Compared

District	1963		1962		1961	
	Cattle	*Hides*	*Cattle*	*Hides*	*Cattle*	*Hides*
Cariboo and South	26,733	644	33,361	896	23,860	776
Kamloops and Nicola	54,934	2,495	54,838	1,919	50,176	2,084
Okanagan and Similkameen	28,619	4,530	31,852	6,677	27,029	5,698
South-eastern British Columbia	11,016	1,755	10,465	1,802	8,945	2,166
Central British Columbia and Peace River	27,012	2,749	23,135	3,970	16,341	4,469
Totals	148,314	12,173	153,651	15,264	126,351	15,193

APPENDIX No. 5

Breed Averages for 1962

Breed	Percentage of Total D.H.I.		Milk (Pounds)		Fat			
					Per Cent		Pounds	
	1961	1962	1961	1962	1961	1962	1961	1962
Ayrshire	3.0	2.7	9,507	9,325	4.03	4.04	383	377
Guernsey	11.5	10.0	8,737	8,673	4.81	4.80	420	416
Holstein	64.3	68.4	11,805	11,646	3.77	3.78	445	440
Jersey	12.8	11.4	7,840	7,720	5.20	5.19	408	401
Unclassified (crossbreds, etc.)	8.4	7.5	10,011	9,794	4.33	4.33	434	424

1961 figures shown for comparison.

APPENDIX No. 6

Animal Pathology Specimen Examinations

	Disease Specimens	Serology	Total
Chickens	4,050	5,980	10,030
Turkeys	963	5,011	5,974
Cattle	394	23	417
Horses	11	-------	11
Sheep	17	-------	17
Swine	29	-------	29
Fur-bearers	407	1,753	2,160
Pet stock	59	-------	59
Wildlife and miscellaneous	913	12	925
Totals	6,843	12,779	19,622

APPENDIX No. 7

Production of Grass and Legume Seeds, 1962–63

	Production (Final), 1962 (Lb.)	Estimated Production, 1963 (Lb.)
Alfalfa	50,000	110,000
Red clover, single	100,000	300,000
Red clover, double	60,000	158,000
Alsike clover	1,500,000	1,000,000
Sweet clover	250,000	1,000,000
White Dutch clover	26,000	20,000
Timothy	65,000	105,000
Timothy-alsike	50,000	65,000
Brome	100,000	145,000
Bluegrass, Kentucky	16,000	5,000
Crested wheat	30,000	50,000
Creeping red fescue	900,000	1,900,000
Meadow fescue	15,000	----------
Orchardgrass	----------	1,800
Redtop	----------	1,500
Chewing's fescue	----------	----------
Birdsfoot trefoil	----------	----------
Ryegrass, perennial	6,000	19,000
Ryegrass, annual	13,000	10,000

APPENDIX No. 8

Production of Small Fruits, Grapes, and Filberts for 1962 and Estimate for 1963

	1962 Production (Lb.)			1963 Estimate of Total Production (Lb.)
	Fresh Sales	Processed Sales	Total Production	
Strawberries	1,501,000	8,883,000	10,384,000	10,597,000
Raspberries	640,000	8,059,000	8,699,000	11,999,000
Loganberries	103,000	919,000	1,022,000	1,440,000
Blackberries	53,000	234,000	287,000	527,000
Black currants	27,000	4,000	31,000	36,000
Red currants	19,000	37,000	56,000	31,000
Gooseberries	17,000	2,000	19,000	15,000
Blueberries	896,000	1,013,000	1,909,000	2,853,000
Cranberries	.....	190,000	190,000	801,000
Grapes	1,223,000	2,198,000	3,421,000	4,141,000
Nuts	267,000	.....	267,000	346,000
Totals	4,746,000	21,539,000	26,285,000	32,786,000

APPENDIX No. 9

Production of Tree-fruit Crops in British Columbia for 1962 and Estimate for 1963

	1962 Production (Lb.)			1963 Estimate of Total Production (Lb.)
	Fresh Sales	Processed Sales	Total Production	
Apples	211,676,000	60,599,000	272,275,000	376,017,000
Crab-apples	1,521,000	692,000	2,213,000	7,434,000
Pears	24,721,000	5,410,000	30,131,000	44,224,000
Plums	317,000	59,000	376,000	368,000
Prunes	9,949,000	4,378,000	14,327,000	12,229,000
Cherries	8,298,000	1,282,000	9,580,000	6,665,000
Peaches	18,330,000	12,844,000	31,174,000	23,167,000
Apricots	8,981,000	6,504,000	15,485,000	5,246,000
Totals	283,793,000	91,768,000	375,561,000	470,350,000

APPENDIX No. 10

Total Acreage of Small Fruits for the Coastal Areas in British Columbia for 1962

	Vancouver Island	Lower Mainland	Total
Strawberries	283.05	1,365.89	1,648.94
Raspberries	13.84	1,441.09	1,454.93
Blueberries	5.20	938.94	944.14
Cranberries	.....	162.50	162.50
Blackberries	24.05	28.75	52.80
Loganberries	194.58	4.50	199.08
Black currants	4.43	1.75	6.18
Red currants	0.50	0.25	0.75
Boysenberries	.....	1.25	1.25
Gooseberries	.....	0.25	0.25
Others	1.71	.....	1.71
Totals	527.36	3,945.17	4,472.53

APPENDIX No. 11

Acreage and Production of Selected Vegetable Crops in British Columbia for 1962 and Production Estimate for 1963

Kind of Vegetable	1962 Acreages	1962 Production (Lb.)	(Lb.) 1963 Estimate of Production
Asparagus	459	902,000	766,000
Beans	1,502	8,957,000	8,735,000
Beets	143	2,675,000	2,646,000
Broccoli	214	1,406,000	1,340,000
Brussels sprouts	71	363,000	385,000
Cabbage	474	7,653,000	10,131,000
Carrots	512	11,141,000	11,344,000
Cauliflower	573	5,973,000	5,689,000
Celery	169	3,819,000	3,317,000
Corn	4,109	31,278,000	32,445,000
Cucumber, field	364	3,586,000	3,541,000
Cucumber, hothouse	.....	1,753,000	1,851,000
Lettuce, field	500	7,847,000	7,624,000
Mushrooms	.....	2,139.000	2,261,000
Onions	690	16,227,000	25,424,000
Peas	8,636	23,195,000	22,073,000
Potatoes, early	1,722	19,559,000	16,852,000
Potatoes, late	6,753	114.465,000	135,151,000
Spinach	132	1,054,000	1,304,000
Tomatoes, field	821	14,471,000	15,062,000
Tomatoes, hothouse	.....	3,174,000	3,090,000
Turnips	224	5,059,000	8,054,000
Other vegetables	890	7,107,000	10,395,000
Totals	28,958	293,803,000	329,470,000

APPENDIX No. 12

Egg Production (Number of Cases[1] through Registered Stations)

Month	A.E.L.	A.L.	A.M.	A.S.	A.P.W.	B	C	CRAX	Estimated Totals, 1963	Totals, 1962
January	2,924	45,000	16,748	2,635	155	2,728	669	4,679	75,538	73,018
February	2,207	35,215	11,933	1,665	87	2,035	427	3,441	57,010	56,832
March	2,234	36,436	11,154	1,813	127	2,084	462	3,417	57,727	57,201
April	2,574	36,665	11,364	2,235	193	2,214	502	3,491	59,238	56,607
May	3,213	47,018	16,213	3,391	306	3,534	793	4,961	79,429	75,476
June	2,423	36,986	13,685	2,921	224	3,585	628	4,150	64,602	61,478
July	3,006	44,562	16,738	3,883	328	4,341	762	5,056	78,676	76,226
August	2,347	35,472	14,325	3,677	401	3,310	686	4,346	64,564	61,165
September	2,328	33,990	14,687	4,074	324	3,053	472	4,303	63,231	60,014
October	3,047	43,973	19,167	4,437	328	3,246	600	4,991	79,789	75,031
November	2,622	35,501	15,272	3,023	228	2,340	525	3,778	63,289	59,637
December	2,872	37,740	14,348	2,601	192	2,595	606	3,870	64,824	61,686
Totals	31,797	468,558	175,634	36,355	2,893	35,065	7,132	50,483	807,917	744,371

[1] Thirty dozen per case.

APPENDIX No. 13

British Columbia Weighted Egg Prices to Producers

(Average paying price weighted by grade.)

Month	1963	1962	1961	Canada, 1963
	¢	¢	¢	¢
January	29.8	30.9	32.0	27.1
February	31.1	28.5	29.5	33.1
March	34.7	29.3	30.8	35.5
April	36.2	31.4	28.5	35.5
May	34.0	28.8	29.0	30.2
June	32.8	26.0	29.7	29.8
July	32.8	26.5	33.9	33.2
August	34.1	32.2	34.6	34.4
September	35.4	34.4	33.1	41.8
October	36.4	32.9	34.2	41.3
November	35.6	34.8	36.6	34.1
December	33.2	33.8	32.5	31.1
Yearly average	33.8	30.9	32.1	33.6

APPENDIX No. 14

Poultry in Pounds through Registered Stations in British Columbia

Month	Chicken	Fowl	Turkey	Duck	Geese	Monthly Totals, 1963	Five-year Averages 1958–62
January	1,260,695	99,837	655,482	256,756	12,355	2,285,125	2,113,794
February	1,439,409	310,592	98,678	10,896	.....	1,859,575	1,806,930
March	1,860,748	312,364	60,965	12,118	.....	2,246,195	1,900,677
April	1,936,546	354,168	294,525	14,360	.....	2,599,599	2,281,369
May	2,721,180	513,957	155,291	26,356	.....	3,416,784	2,938,703
June	2,135,597	428,330	434,352	30,387	.....	3,028,666	2,750,181
July	2,700,875	596,315	487,458	33,722	.....	3,818,370	2,935,227
August	2,337,457	389,025	979,934	28,853	.....	3,735,269	3,426,312
September	1,936,312	447,109	805,304	37,918	.....	3,226,643	3,490,162
October	2,455,326	587,638	1,653,474	45,832	291	4,742,561	3,902,668
November	2,401,347	529,775	646,183	29,870	.....	3,607,175	3,572,853
December	1,914,615	332,998	863,880	19,465	.....	3,130,958	3,162,530
Yearly totals	25,100,107	4,902,108	7,135,526	546,533	12,646	37,696,920	34,277,406

APPENDIX No. 15

1963 Average Monthly Producer Price for Live Poultry (Vancouver)

Month	Chicken				Fowl			Young Turkey		
	Under 4 Lb.	4–5 Lb.	5–6½ Lb.	6½ Lb. and Over	Under 5 Lb.	5–6 Lb.	Over 6 Lb.	Under 10 Lb.	10–20 Lb.	Over 20 Lb.
January	22½	25	26	26	11	12	15	28	28	25
February	22½	23	27	27	11	11	16	28	27	25
March	22½	23	27	27	11	11	17	29	27	25
April	22½	23	27	27	11	11	17	28	27	25
May	22½	23	27	27	11	11	16	29	28	25
June	22½	23	26	27	11	12	16	29	28	25
July	22½	22½	26	27	11	12	16	29	27	25
August	22½	22½	25	26	12	14	17	29	27	24
September	22	22	24	26	12	14	17	29	27	24
October	20½	20½	25	26	12	14	17	29	27	24
November	20	20	24	26	10	12	16	29	27	24
December	18	18	23	26	10	13	16	29	29	25

APPENDIX No. 16

Amount and Kind of Vaccine Distributed (in Doses)

Type of Vaccine	1959	1960	1961	1962	1963
Newcastle disease	8,747,150	8,829,800	13,751,400	10,674,636	13,084,000
Infectious bronchitis	1,851,450	1,816,600	3,184,900	2,442,436	4,866,000
Epidemic tremors	----------	----------	----------	----------	35,000
Totals	10,598,600	10,646,400	16,936,300	13,117,072	17,985,000

APPENDIX No. 17

Publications Printed in 1963

Reports

Annual Report of the Department of Agriculture, 1962.
The Climate of British Columbia, 1962.
Annual Report of the Milk Board, 1962.
Agricultural Statistics Report, 1961.
Report of Hog Crossbreeding Trials Conducted at Colony Farm, Essondale, B.C., 1960–63.

Bulletins and Charts

Diseases of Pole Beans.
Ticks and Man.
Observations on Raspberry Varieties as Grown in the Fraser Valley.
Supplementary Recommendations for Holly Culture.
Brooding Baby Chicks.
The Use of Drugs and Antibiotics in Controlling Bee Diseases.
Vegetable Varieties Recommended for Planting in the Southern Interior of British Columbia.
Practical Duck Raising.
Pumps and Conveyors for Fluid Manure.
Poultry Feeds and Feeding in Central and Northern British Columbia.
Women's Work in Fair Exhibits.
Swine Diseases in British Columbia, Symptoms, Control, and Treatment.
The Fur Farming Industry in British Columbia.
The Home Vegetable Garden.
Insect and Disease Control for the Home Gardener.
Mineral Deficiencies and Other Disorders of Fruit Trees.
Livestock Pests.
Minimum Requirements for the Design, Installation, and Performance of Sprinkler Irrigation Equipment.
Mechanical Feeding of Silage.
Tulip Bulb Culture in British Columbia.
Dugouts in Domestic Water Development.
Chemical Weed Control around the Home.
Stony Pit of Pears.
Small Fruit Growing in the Okanagan and Kootenays.
Red Raspberry Growing with Particular Application to the Fraser Valley.
Procedure for the Construction of an Earth Fill Dam.
Tree Fruit Spray Calendar, Interior Districts, 1963.
Forage Crop Recommendations for South-eastern British Columbia, 1963.
Forage Crop Recommendations, Boundary-Okanagan-Kamloops-South Cariboo, 1963.
Fertilizer Recommendations for South-eastern British Columbia, 1963.
Fertilizer Recommendations for Boundary-North Okanagan-South Okanagan-Kamloops-South Cariboo, 1963.
Spray Calendar for Coniferous Evergreens and Roses.
Fertilizer Recommendations, Peace River, 1963.
Chemical Weed Control, 1961–63 (reprint).

Miscellaneous

List of Publications.
Who's Who in B.C. Agriculture.

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