DOMINION OF CANADA

DEPARTMENT OF AGRICULTURE

DOMINION EXPERIMENTAL FARMS

EXPERIMENTAL STATION
INVERMERE, B.C.

INTERIM REPORT OF THE SUPERINTENDENT

R. G. NEWTON, B.S.A.

FOR THE YEAR ENDING MARCH 31, 1921

Invermere Experimental Station.—Alfalfa crop. First cutting, going three tons to the acre.

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EXPERIMENTAL STATION, INVERMERE, B. C.

Report of the Superintendent, R. G. Newton, B.S.A.

SEASONAL NOTES

Meteorological records have been kept at the Station for seven years, and during that period the past season has been remarkable for the number of extremes, one way or the other, that have been recorded.

April was very cool, the mean temperature being much below the average, while the rainfall of 1.26 inches is the largest on record. Some ploughing was done in the garden, but no work was commenced in the field. May continued cool, being 23 degrees below the average. Field crops were planted early in the month, but growth was relatively slow. The temperature through June continued cool, the mean temperature of 53.5 being the lowest on record for that month. Rainfall was also light, being only half the average for the past seven years. With July came the warm weather, the mean temperature of 65.94 degrees being the highest on record. August continued warm, and most of the crops were harvested under ideal conditions. The rainfall for the month (0·38 inches) is the lowest on record. September was dull and cloudy; rain fell on thirteen days, but the rainfall was below the average of the past few years. Slight frosts did no particular damage to roots and vegetables. October continued dull, with strong winds early in the month. The rainfall was again below the average; so were also the hours of sunshine. November, with the exception of the cold snap early in the month, was quite mild, the mean temperature being above the average. Very little snow fell, and precipitation was the lowest on record. The weather continued mild in December, the mean temperature being well above the average. The first snow storm of the season occurred on December 11. The lowest temperature of the year was registered on December 23, when the mercury dropped to -13. January continued mild, the mean temperature (18.3) being about 5 degrees above the mean for the past seven years. The snowfall was light and below the average. February was quite mild, the mean temperature being the highest since 1914; while precipitation was about the average. March was very variable, but mild on the whole. Precipitation was slightly above the average. At the end of March the soil was quite dry and dust blowing. Ploughing commenced early in the month, and indications point to an early spring.

METEOROLOGICAL RECORDS

Month	Temperatures			Precipitation				Total hours sunshine
	Mean	Highest	Lowest	Rain	Snow	Total	Average per month for past 7 years	
				inches	inches	inches	inches	hours
1920								
April	38·3	66	16	1·01	2·5	1·26	0·73	150·8
May	46·8	76	27	1·19	.....	1·19	1·59	203·2
June	53·5	85	31	0·80	.....	0·80	1·60	231·4
July	65·9	92	41	1·32	.....	1·32	1·56	333·8
August	61·2	90	35	0·38	.....	0·38	1·52	259·0
September	51·5	83	29	0·86	.....	0·86	1·02	179·1
October	38·8	67	13	0·39	.....	0·39	0·69	113·5
November	28·5	48	−03	0·18	.....	0·18	0·53	78·6
December	21·0	41	−13	0·01	8·2	0·83	1·03	48·9
1921								
January	18·3	40	−10	0·11	8·7	0·98	1·03	58·2
February	23·3	51	−07	0·12	6·0	0·72	0·71	103·8
March	30·3	57	−04	0·38	2·2	0·60	0·42	153·4
Totals	.....	.....	.....	6·75	27·6	9·51	12·43	1,913·7

LIVE STOCK

HORSES

Three horses are kept on the Station—a work team and a driver. No experimental work in feeding has been undertaken to date.

CATTLE

At present there are three milch cows, a Shorthorn bull and three young heifers. The stock is all in good condition. The milk is largely consumed by the Station hands and the poultry. One of the Jerseys freshened on June 12, 1920, as a junior two-year-old, and up to March 31 had produced 5,662 pounds of milk, testing 4.6 per cent butter fat.

SWINE

Four Berkshire sows and one boar comprise the swine on the Station at the present time.

Cost of maintaining sows and raising pigs from breeding time until pigs were six weeks old

The expense of keeping the boar is included in this test, as a boar is found on the majority of farms. Three sows were used in this experiment, and the following table shows in detail the weight and cost of feed, the number of pigs raised, and the cost and value of same:—

Weight of feed consumed and value—	
Shorts, 700 lb. at $3	$21 00
Middlings, 800 lb. at $3.25	26 00
Tankage, 100 lb. at $4.50	4 50
Roots, 6,000 lb. at ¼ cent	15 00
Total cost of feed	$66 50
Average per sow and boar	$16 63
Number of pigs raised—	
Sow No. 1	5
Sow No. 2	5
Sow No. 3	7
Total	17
Cost of raising 17 pigs	$66 50
Average per pig	3 91
Value per pig on July 15, at the average age of six weeks	10 00

BEES

The season of 1920 clearly demonstrated how climatic conditions control the honey crop in this province. The spring was long, cold and wet, while the summer was comparatively short and dry. The yields were somewhat reduced this season, but compare favourably with the yields obtained throughout the Kootenays, and in the remainder of the province. From nine hives, spring count, honey weighing 810 pounds was extracted, an average of 90 pounds per hive. The greatest yield from one hive was 199 pounds. The honey was put up in five-pound containers, and sold at 47 cents per pound. The net value of the honey was $380.70, an average of $42.30 per hive. In the fall an average of 20 pounds of sugar was fed to each colony, and this, with the loss of one hive from winter-killing, deducted from the gross returns, shows a net return of $327.70, or a net return per hive of $36.41.

AVERAGE PRODUCTION FOR THE PAST FIVE YEARS

Year	Number of hives	Average yield per hive
		lbs.
1916	8	117
1917	10	81·25
1918	12	118·9
1919	7	126·4
1920	9	90
Average of five-years period	.....	106·6

WINTER FEEDING

Year	Number of hives fall count	Weight of sugar fed	Average weight of sugar per colony	Total value of sugar	Value of sugar per colony
		lbs.	lbs.	$ c.	$ c.
1917	14	340	24·3	38 25	2 73
1918	10	160	16	22 00	2 20
1919	11	180	16·4	23 40	2 13
1920	10	200	20	46 00	4 60

During the winter of 1919-20 four colonies of bees were wintered in the Ontario wintering box, and seven in Kootenay cases. One colony in a wintering case died in the early spring from dampness, and one colony in a Kootenay case was very weak and was therefore united with another colony. Our best results in wintering have been with the Kootenay case. Bee-keepers will do well to give this case a trial.

Invermere Experimental Station.—Apiary, showing Kootenay hive cases, which have given good results.

POULTRY

White Wyandottes and Barred Rocks, two good utility breeds, are kept at the Station. Both these breeds have good table qualities and are able to make a very creditable showing in egg production.

PEDIGREE TRAP-NESTING

All birds are trap-nested during their pullet year, and from our best producers we make up our breeding pens. These pens are mated with males of known ancestry, and by hatching each hen's eggs in a separate hatching box, toe punching, and leg and wing banding, each chick's identity is preserved, and, in time, pedigrees established. It is hoped that in this way the egg production will be increased. In many cases, however, the eggs from high-producing birds have proven very infertile, difficult to hatch, and up to the present no pullet has exceeded her dam's record. The following tables show, first, some of the most outstanding examples of the poor fertility and hatchability of our high-producing hens; and second, some of the best hatching results obtained from the high-producing hens. This work is being continued, and more stress will in the future be given, first, to the male, as egg production, like milk production, is a sex-linked character transmitted by the male; and secondly, to constitution, vigour and prepotency.

HATCHING RESULTS OF HIGH-PRODUCING HENS

Poor Results

Bird No.	Egg production—Pullet year	Eggs set	Infertile	Dead germs	Hatched out	Mortality
2	(White Wyandottes) 249	6	5	.....	1	.....
4	" " 230	7	4	3	.....	.....
102	" " 208	15	10	5	.....	.....
4	(Barred Rocks) 192	9	9	.....	.....	.....

Best Results

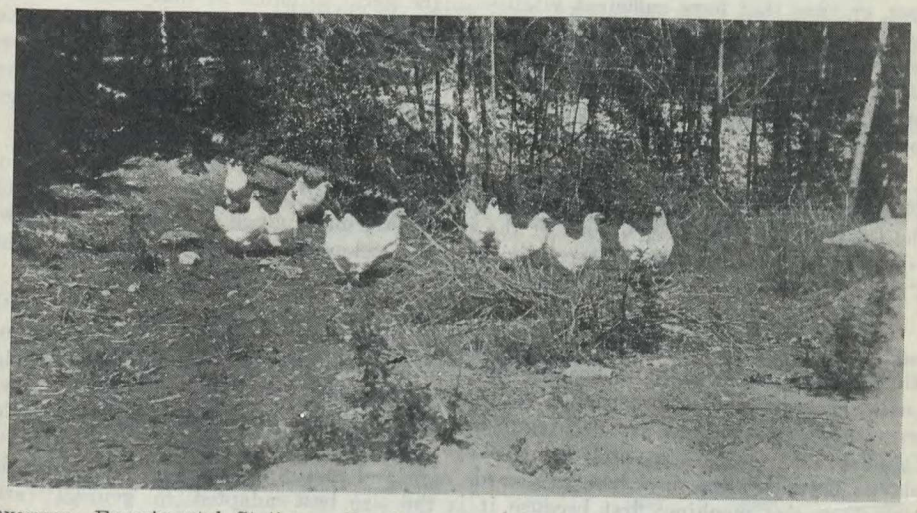
1	(White Wyandottes) 240	29	10	6	13	2
5	" " 221	28	8	4	16	3
45	(Barred Rocks) 175	12	3	4	5	.....

RETURNS OVER COST OF FEED

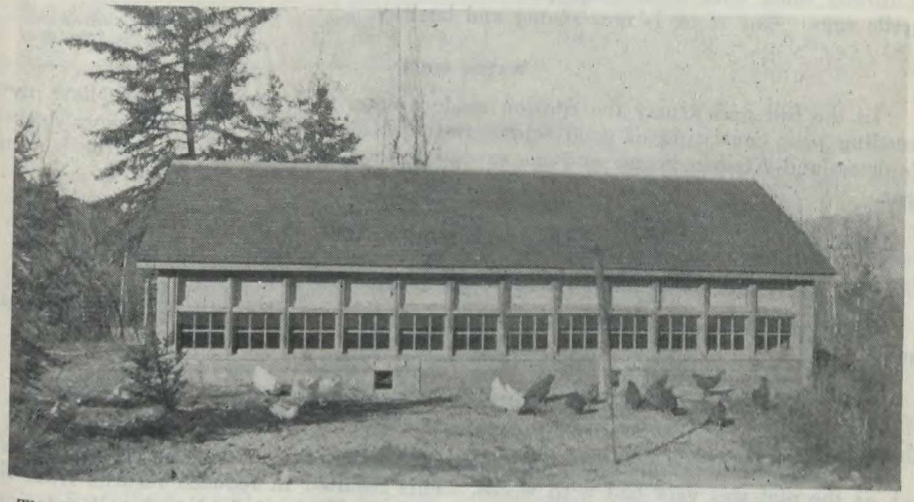
The following table summarizes the data from two pens each of Barred Rocks and White Wyandottes. Pen No. 1 of Rocks were earlier birds and gave a better account of themselves during the winter months when the price of eggs was high. The same may be said, but to a less extent, regarding pen No. 3 of Wyandottes. The two factors that had the greatest bearing on the reduced returns are, first, a large percentage of pullets were late hatched, and secondly, the high cost of feeds:—

RETURNS OVER COST OF FEED

Pen No.	Breed	Number of birds	Total eggs laid	Value of eggs	Weight of feed	Value of feed	Profit per pen	Profit per bird
				$ c.	lbs.	$ c.	$ c.	$ c.
1	Barred Rocks	25	3,316	177 61	2,136	89 98	87 73	3 51
2	Barred Rocks	60	5,239	284 97	4,218	175 94	109 03	1 81
3	Wyandottes	15	1,414	77 85	1,134	46 95	30 90	2 06
4	Wyandottes	15	1,336	74 95	1,148	47 19	27 76	1 85



Invermere Experimental Station.— Breeding pen of White Wyandottes. Egg records from 175 to 236.



The Farmer's one-hundred-hen house; erected at the Invermere Experimental Station in 1920. Note the glass and cotton front.

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HATCHING

In laying, our best results from pullets are obtained from early hatches, such as late March or early April. Difficulty is experienced, however, in obtaining fertile eggs, or eggs that have sufficient vitality in the germ to hatch at that season of the year. This is due to our drawn-out winter, and possibly to our situation, in that we have only a limited amount of sunshine striking the poultry houses during the winter. Last season our fertility ran from 73 to 79 per cent for March and April, but we hatched only one-third of these, largely owing to low vitality. The percentage fertility of Barred Rocks was 81·2 and of Wyandottes, 67·7.

Incubators.—A Buckeye incubator, 600-egg capacity, was installed this season. This machine is heated by a hot-water system and a coal oil burner. On account of the low vitality of the eggs, none of the incubators made much of a showing. However, under these unfavourable conditions, the Buckeye gave better results than the Prairie State or the Cyphers.

Brooding.—The brooding of chicks during the past season was done entirely with coal-stove brooders. These have replaced the oil-burning brooder and hovers. Some difficulty was experienced in keeping fires on, but this was due to the quality of the coal. If good coal is procurable, the stoves are easily regulated and give a very constant heat, as they are self-regulating. Two makes have been tried out—the Candee, 1,000 chick size, and the Buckeye, 500 chick size. There is not much to choose between these brooders as regards care and manipulation, but we prefer the 500 chick size machine, first because it is the size best adapted to general farm conditions, and secondly, we have found the per cent mortality greater when a large number of chicks are together in the one brooder.

During the season we have had a great many calls for hatching eggs and male birds.

TURKEYS

Our work with turkeys during the past season was at a standstill. An exchange of turkey toms with Lethbridge proved disastrous, in that we had practically no fertile eggs. Our stock is now strong and healthy.

WATER FOWL

In the fall and winter the Station made a start with waterfowl. We have now breeding pens consisting of good representative birds of Pekin and Muscovy ducks; Toulouse and African geese; and are expecting some interesting work in the coming year.

FIELD HUSBANDRY

ROTATIONS—IRRIGATED LAND

Three rotations are being tried out on the irrigated portion of the Station, namely:—

A. A four-year rotation—Hoed crop (roots)—wheat—peas—oats.
B. A five-year rotation—Wheat—roots—oats seeded to clover—clover—clover.
J. A three-year rotation—Oats seeded to clover—clover—potatoes.

The peas in Rotation A plot were ploughed under this season instead of harvested, as the plot was very bad with weeds. This resulted in reduced returns from the rotation, as is shown in the accompanying table. The cereal plots in all rotations were very fair this season. Difficulty was experienced with cutworms on the root plots, although two applications of poisoned bran were used.

In Rotation B the second-year stand of clover was winter-killed, and this plot was seeded to peas and ploughed under.

Rotation J continues to be the money-maker, due largely to the high yields of potatoes. This rotation should eventually help to add humus to the soil, as the second cutting of clover is ploughed under every three years.

IRRIGATED ROTATION RETURNS

Rotation	Duration in years	Cost per acre	Returns per acre	Profit per acre in 1920	Average profit 2 years
		$ c.	$ c.	$ c.	$ c.
"A"	4	42 10	54 34	12 24	42 89
"B"	5	38 80	81 91	43 11	39 46
"J"	3	59 84	199 49	139 98	186 41

(A table giving irrigation figures for the past five years is appended.)

IRRIGATION TABLE

ROTATION "A" FOR FIVE YEARS

Year	Total precipitation for year	Total precipitation 6 months April-Sept.	Acre-inches used on roots	Acre-inches used on wheat	Acre-inches used on peas	Acre-inches used on oats	Average acre-inches per plot
	inches	inches					
1914	12·91	8·78	12·78	9·27	11·40	5·89	9·83
1915	14·47	11·25	2·03	5·04	5·84	6·73	4·91
1916	14 28	11·00	1·62	Nil	3·52	Nil	1·31
1917	11·70	7·28	5·75	7·55	9·69	4·14	6·78
1918	13·79	7·08	18·30	9·91	9·57	11·38	12·29
1919	10·74	5·14	6·12	13·17	10·04	7·46	9·19
1920	9·32	5·81	14·06	8·51	6·61	7·73	9·23
Average amount of water used per acre, in acre-inches			8·66	7·63	8·09	6·19	7·64

ROTATIONS—DRY LAND

On the dry land plot a six-year rotation is followed, namely: Roots, barley, summer-fallow, wheat, peas and oats, summer-fallow. The crops were a complete failure, and what little show there was on the plots was ploughed under on August 20. The root seed did not germinate. The past two seasons' crops have been complete failures, but this could hardly be otherwise, considering the small precipitation during that period.

FERTILIZER EXPERIMENT

The object of this is to ascertain the effect of omitting in turn each element of plant food from a fertilizer mixture; also to ascertain the relative influence, under irrigation, of nitrogen in various forms. A three-years' rotation is followed, namely: Potatoes, oats seeded to clover, clover.

The following table summarizes the work to date. So far much of the data is conflicting, and no conclusions will be attempted until after the clover crop of the coming season:—

FERTILIZER EXPERIMENT

Plot No.	Manure	Quantity per acre	Potatoes, 1919 — Yield per acre	Oats, 1920 — Yield per acre — Straw	Oats, 1920 — Yield per acre — Grain
		lbs.	Tons lbs.	Tons lbs.	lbs.
1	(No manure)	.....	19 400	2 1,600	2,240
2	Acid phosphate Muriate of potash	500 160	17 480	2 1,680	2,240
3	Sulphate of ammonia Muriate of potash	160 160	17 800	2 800	2,080
4	Sulphate of ammonia Acid phosphate	160 500	20 400	2 1,200	2,240
5	Acid phosphate Sulphate of ammonia Muriate of potash	500 160 160	19 600	2 1,760	2,480
6	(No manure)	.....	18 160	2 1,760	2,480
7	Barnyard manure	15 tons	21 1,600	3 160	2,560
8	Sulphate of ammonia Acid phosphate Muriate of potash Barnyard manure	80 250 80 10 tons	19 400	3 1,040	2,880
9	Nitrate of soda Acid phosphate Muriate of potash	210 510 160	17	3 960	3,040
10	Dried blood Acid phosphate Muriate of potash	280 500 160	21 1440	3 400	2,800

CUTTING BARLEY FOR HAY AND THEN PRODUCING A GRAIN CROP

This experiment has shown that good results may be secured by cutting early barley for hay and ripening the second crop for grain.

Two plots of Success barley were sown on May 11. On July 15 one plot was cut for hay, immediately irrigated and forced into growth, and harvested for grain on September 10. The first plot, which was left for grain, was cut on August 13. The following summarizes the results:—

Plot No. 1 yielded 2,000 pounds of grain per acre.

Plot No. 2 yielded 1 ton 1,393 pounds of hay, 1,885 pounds of grain.

A sample of the hay was forwarded to the Dominion Chemist for analysis, with the following results and comments:—

ANALYSIS OF BARLEY HAY

Moisture	4.87
Crude protein	10.35
" fat	3.98
Carbohydrates	44.63
Fibre	26.87
Ash	9.30
	100.00
Albuminoids	7.89
Non-albuminoids	2.46

COMMENTS OF DOMINION CHEMIST

"Though the fibre content of the sample is higher than that quoted from American sources, I am of the opinion, judging largely from the appearance of the sample, that the palatability and digestibility have not been materially impaired, and that probably in this regard the sample is not inferior to that represented by the American analysis. The higher percentage of crude protein in the sample here reported on is a feature of considerable interest, indicating a distinctly higher nutritive value. I should consider this an excellent forage, palatable and nutritious and distinctly more valuable for dairy stock than many of the hays from grasses."

CULTURAL EXPERIMENT

—	Yields in bushels				
	1917	1918	1919	1920	Average four years
Oats continuously—					
Manured 12 tons per year	40·7	25·4	85·3	82·0	56·8
Oats seeded to clover and clover ploughed in	25·4	23·3	67·8	31·8	37·1
Oats—Summer-fallow	38·4	13·0	54·0	37·0	35·6
Oats continuously	34·7	22·5	43·5	38·8	34·9

The cultural test with oats is proving very interesting and shows conclusively the value of barnyard manure, and clover as a green manure, on the crop yields.

While "oats—summer-fallow" in the preceding table show a higher yield than "oats continuously," it must be remembered that with oats-summer-fallow it takes two years to obtain these results, or twice the land that is needed for the other plots. The yields then, on a yearly basis, should be cut in half. It does not pay to summer-fallow irrigated land.

CEREALS

Variety tests were continued with wheat, oats, barley and peas. A five-year rotation is followed, alternating legumes with cereals, and ploughing a crop of peas and clover under so as to add humus to the soil. The rotation is as follows:—

First year.—Peas ploughed under for humus.
Second year.—Cereals seeded down with clover.
Third year.—Clover (second crop ploughed under).
Fourth year.—Peas for seed.
Fifth year.—Cereals.

Duplicate one-fortieth acre plots are sown of the various grains, and the plots irrigated as required.

The following table summarizes our results with cereals and peas to date. Peas are possibly our most outstanding and promising crop in this line, as both the yield and quality are hard to equal. Our soil and climatic conditions are particularly favourable for this crop, and so far we have not been troubled with mildew, weevil or aphis.

Ruby wheat, a recent introduction of the Dominion Cerealist, is showing up very well. This wheat is intended as more of a dry land wheat than Marquis, and ripens about a week to ten days earlier.

The hulless oat (Liberty) is showing up favourably, and as it becomes better known will no doubt find a place on many farms.

Amongst the barleys, Guymalaye, a hulless sort, is a heavy yielder of grain. Its green colour should be no objection to it as a stock food.

SUMMARY OF VARIETY TESTS WITH WHEAT, OATS, BARLEY AND PEAS

Variety	1915		1916		1917		1918		1919		1920		Average	
	Bush.	lbs.	Bush.	lbs.	Bush.	lbs.	Bush.	lbs.	Bush.	lbs.	Bush.	lbs.	Bush.	lbs.
WHEAT—														
Huron	22	22	38		27	40	12	30	39	20	44		30	39
Marquis	23	40	34	40	24	20	24	40	31	40	34		28	50
Pioneer	22	40	22	20	23	20	24	20					23	15
Ruby									29		30	40	29	50
Kubanka									30		34	40	32	20
OATS—														
Banner	38	08	125	10	30	40	24	38	101		87	2	67	33
Daubeney	35		64	24	24	28	17	24	67	02	70	20	43	24
Victory	32	07	89	14	36	32	33	36					48	05
Liberty							28	28	22	32	35	10	29	
BARLEY—														
Manchurian	25		32	44	18		16	20	46	32	54	08	32	09
Gold	24	08	86		45	20	30	20	68	36	50		50	39
Chevalier	40		60		23	36	23	46					36	47
Success	16	42	15	20	15	40	11	20	45	40	41	42	24	26
Guymalaye									48	16	84	08	66	12
PEAS—														
Prussian Blue			27		55	40	23	20	89	20	53	20	49	44
Chancellor			43		45		23	40	57	20	63	20	48	20
Arthur			36	40	44	40	30		67	20	52		46	08
Solo			27	40	47	40	30	10	70		52		45	30
Golden Vine			26		48		20	40	60		62		40	45

FORAGE CROPS

CLOVER AND GRASSES VERSUS ALFALFA AND GRASSES

An experiment was commenced in 1917 to compare the results of various mixtures of grasses and clover with corresponding mixtures of grasses and alfalfa for hay. The plots were seeded on June 15, 1917, and no crop was taken the first year. Irrigation water was applied when necessary, and two cuttings have been taken each year for the past three seasons. For the first two years the clover and grasses out-yielded the alfalfa and grasses, but during the winter of 1919 a great deal of the clover was winter-killed, so that the alfalfa and grasses out-yielded the clover and grasses in the third year. Averaging the three seasons, the clover and grasses have out-yielded the others. Alfalfa had a tendency to crowd out the various grasses, so much so that in some plots very little grass remained.

A mixture of grass with either clover or alfalfa increased the yields. It is interesting to note that meadow fescue with both clover and alfalfa heads the list on the three years' average. Tall oat mixture is the lowest yielder of the mixtures in both cases. Timothy, western rye and orchard grass, however, make a very creditable showing. For general farm practice, where hay is wanted off an area for a year or two, clover and grasses would be preferable, while alfalfa and grasses would be better where more permanent hay lands are required.

ALFALFA AND CLOVER WITH GRASS MIXTURES

Alfalfa and Grass Mixtures

Plot No.	Mixture sown	Summary of Yields 1918	1919	1920	Average three years
		Tons	Tons	Tons	Tons
1	Alfalfa—Timothy	4·6	5·87	5·55	5·34
2	" Western Rye	4·62	5·46	5·3	5·13
3	" Meadow Fescue	5·0	5·28	5·23	5·33
4	" Orchard Grass	4·65	4·74	6·03	5·14
5	" Tall Oat	3·6	3·54	4·95	4·03
6	Alfalfa mixture	5·16	3·51	5·64	4·77
7	Alfalfa	4·41	3·94	4·56	4·3

Clover and Grass Mixtures

1	Clover—Timothy	5·13	5·88	3·28	4·76
2	" Western Rye	6·88	5·88	3·52	5·43
3	" Meadow Fescue	6·9	5·79	4·05	5·58
4	" Orchard Grass	6·12	6·15	3·93	5·4
5	" Tall Oat	5·91	6·21	3·6	5·24
6	Clover mixture	6·63	6·12	3·34	5·36
7	Clover	5·94	4·9	3·0	4·61

Alfalfa as a permanent crop is steadily increasing in favour throughout the district. It is not so liable to winter-kill as clover, and produces two fine cuttings per year, running from three to four tons per acre. It is possible to take a third crop, but this is very difficult to cure; this drawback could, however, be overcome by putting it into a silo.

FIELD CORN

Ten varieties of corn were tried out this season on irrigated land. The corn was sown on May 31 and harvested on September 1. The crop was irrigated as required. It was not as heavy as the preceding year's crop. Only a few cobs formed, and none matured. The following table gives varieties and yields for the past two seasons:—

INDIAN CORN—TEST OF VARIETIES

Variety	Yield 1919		Yield 1920		Average yield	
	Tons	lbs.	Tons	lbs.	Tons	lbs.
Longfellow	16	1,400	13	652	15	26
Yellow Flint Maine	15	1,700	13	1,532	14	1,611
Wisconsin No. 7	19	1,200	10	729	14	1,464
North West Dent	16	1,100	11	1,691	14	395
Compton Early	14	200	13	304	13	1,252
White Cap Yellow Dent	14	1,750	9	1,162	12	456
Canada Yellow	18	1,600	.....		.....	
Ewing's Yellow Flint	.....		10	904	.....	
Improved Leaming	.....		10	53	.....	

SUNFLOWERS

Russian Giant sunflowers were tried on both irrigated and dry land. They were sown on June 1 and harvested on September 1. This crop might well be sown at least two weeks earlier. The yields obtained compare quite favourably with field corn. Practically no heads were formed. The yields per acre were as follows:—

	Irrigated	Dry land
	Tons lbs.	Tons lbs.
Russian Giant Sunflower	16 923	9 639

MANGELS

The seed used in the variety tests this past season was restricted to that produced on the Farms and Stations throughout the system. Special attention was given to ascertain the trueness to type and freedom from other varieties. The drills were 2½ feet apart, and the plants were thinned to a foot apart in the rows. The seed was sown on May 28, and the crop was harvested on October 28. The crop was irrigated twice—on July 3 and August 5. Some difficulty was experienced with cutworms, although poisoned bran was applied on two occasions.

MANGELS—TEST OF VARIETIES

Variety	Yield per plot	Yield per acre	Per cent Stand	Yield 100% Stand	Notes
	lbs.	Tons lbs.		Tons lbs.	
Sludstrup (Summerland)	610	16 208	75	20 260	(1)
Danish Sludstrup (Kentville)	912	24 153	92	26 341	(1)
Yellow Intermediate (Ottawa)	670	17 1,396	90	19 1,329	(1)
Select Yellow Intermediate (Charlottetown)	782	23 289	85	27 458	(2)
Yellow Intermsdiate (Charlottetown)	570	15 96	90	16 1,440	(2)
Yellow Leviathan (Agassiz)	950	25 160	90	27 1,733	(1)
Half Sugar White (Charlottetown)	982	25 1,849	98	26 908	(1)

NOTES.—(1) Uniform type.
(2) Not true to type. Some Half Sugar White mixed in.

SUGAR BEETS

Three varieties of sugar beets were grown this season, the seed being sown on May 28 and the crop harvested on October 8. The Chatham variety had an excessive number of leaves. As with mangels, the cutworms were bothersome. The following is a statement of yields:—

SUGAR BEETS—TEST OF VARIETIES

Variety	Yield per plot	Yield per acre	Per cent Stand	Yield 100% Stand
	lbs.	Tons lbs.		Tons lbs.
B. C. Grown	502	13 505	85	13 1,182
Chatham	430	11 704	65	17 929
Kitchener	680	17 1,904	80	22 880

CARROTS

Only two varieties of carrots were grown this season. The White Intermediate came from seed produced at Summerland, and the Danish Champion from Ottawa. The seed was sown on May 28, and the crop harvested on October 8. The yields were as follows:—

CARROTS—TEST OF VARIETIES

Variety	Yield per plot	Yield per acre	Per cent Stand	Yield 100% Stand
	lbs.	Tons lbs.		Tons lbs.
White Intermediate	827	22 1,655	100	22 1,655
Danish Champion	630	16 1,264	90	18 960

These two varieties were quite true to type and uniform.

HORTICULTURE

POTATOES

Notwithstanding the season, the potato yields were the highest to date. Special care was taken to plant tubers showing vigorous sprouting tendencies. They were planted one foot apart in the row, with the rows 2½ feet apart. Planting was done on May 21, and the crop was harvested on September 20. They were irrigated as required. No disease outside of common scab was noticed. Our alkaline soils have a tendency to increase this disease, and growers would be well advised to grow such potatoes as the Cambridge Russet or Netted Gem where this disease is at all bad, as these potatoes are scab resistant. The value of a change of seed is exemplified in our returns. Two varieties (Gold Coin and Irish Cobbler) were obtained from Lethbridge and planted along with seed that has been grown at Invermere for the past six years. The following table clearly demonstrates the value of new seed:—

Variety	Yield from Lethbridge seed	Yield from Invermere seed
	Tons lb.	Tons lb.
Gold Coin	44 1,183	32 781
Irish Cobbler	30 1,731	24 1,966

The following shows the yields from twenty-four varieties:—

POTATOES—TEST OF VARIETIES

Variety	Yield per acre		Percentage marketable
	Tons	lb.	
Gold Coin (Lethbridge)	44	1,183	96
Ashcroft	38	400	92
Houlton Rose	36	44	95
Delaware	34	1,720	97
Gold Coin (Invermere)	32	781	96
Cambridge Russet	31		90
Irish Cobbler (Lethbridge)	30	1,731	92
Manistee	28	1,228	86
Early Six Weeks	26	1,452	90
Eureka Extra Early	26	290	85
Bermuda Early	25	1,064	90
Irish Cobbler (Invermere)	24	1,966	92
Sir W. Raleigh	23	1,061	95
Carman No. 1	23	770	93
Wee McGregor	22	1,899	92
Sutton Abundance	22	737	76
Early Rose	22	737	85
Early Northern	21	1,575	89
Late Puritan	21	703	90
Bovee	21	413	92
Silver King	20	1,541	93
Early Ohio	20	1,251	86
Snow	20	1,541	92
American Wonder	16	536	93

TOMATOES

Eleven varieties were tried out this year. The seed was sown in hot-beds on the 24th March, and planted out on the 15th of June. The plants were set a foot apart in the row, and the rows 2½ feet apart. Each plant was staked and pruned to a single stem and two trusses of fruit. Our season being short, we have to prune the plants heavily to hasten ripening. The following table shows the yields from ten plants of each variety:—

TOMATOES—TEST OF VARIETIES

Variety	Date ripened	Total yield		Size of fruit
	August	lb.	oz.	
Alacrity, A.1 18, C.E.F	10	42	8	Large.
Langdon Earliana (Summerland)	9	38		"
Burbank Early, 0-8679	7	33	12	"
Earlibell (Simmers)	7	30	8	"
Alacrity 20, C.E.F	7	27	12	"
Bonny Best (Stokes)	8	26	12	"
Danish Export, 0-8697	13	26	8	Small to medium.
Prosperity (Graham)	9	24	12	Large.
Chalk's Early Jewel (Carter)	17	24	8	"
John Baer (Carter)	21	23		Very large.
Red Head (Langdon)	23	21		Large.

Invermere Experimental Station.—Tomato plants, staked, tied, and pruned to two trusses of fruit. This method has given good results for our short season.

The following cultural experiments in staking and pruning were tried with Bonny Best and Alacrity:—

CULTURAL EXPERIMENTS WITH TOMATOES

Test	Yields per Plant					
	Bonny Best		Alacrity		Average	
	lb.	oz.	lb.	oz.	lb.	oz.
1. Terminal bud of plant pinched off after first truss had formed, and three side shoots with a truss of fruit allowed to develop..	5	2	4	0	4	5
2. Terminal bud of plant pinched off after first truss had formed, and two side shoots with a truss of fruit allowed to develop..	4	6	3	0	3	11
3. Terminal bud pinched off before any truss of fruit had formed, and three side shoots with a truss of fruit allowed to develop.	5	0	2	12	3	14
4. Plant trained to a single stem, and stopped after the second truss of fruit.....	2	2	3	2	2	10
5. Plant trained to a single stem, and stopped after the third truss of fruit.....	4	14	3	4	4	1
6. Naturally grown.....	1	0	1	4	1	2

All methods of training proved superior to the natural grown. Plants with the fewest trusses of fruit were the first to ripen. The four-truss system produced the largest yield, but principally because the frost did not come as early as usual. Under the first three systems, plants require to be set at least 18 inches apart in the rows; Nos. 4 and 5 a foot apart in the rows; and No. 6 four feet apart each way. It was also noticed that different varieties require different training to produce the best results.

GARDEN PEAS.

Garden peas were sown on May 20.

Variety	Seedsman	Number of days from sowing to first picking	Length of straw	Total crop per 30-ft. row
			inches	lb. oz.
Lincoln		68	20	22 8
Pioneer	Gregory	61	25	22 0
Advancer	C.E.F.	64	28	20 8
Thos. Laxton	McDonald	64	34	19 0
Stratagem	Carter	64	33	16 0
Potlatch	Dreer	74	36	14 12
Laxtonian	Graham	61	20	14 0
Sutton Excelsior	Harris	59	25	13 8
American Wonder	Carter	62	12	12 8
Carter 8 Weeks	Gregory	59	15	12 0
Gregory Surprise	Gregory	55	30	12 0
Telephone	Bruce	74	44	12 0
Little Marvel	Graham	59	12	10 0
Early Morn	Gregory	59	26	10 0
Gradus	Kentville	68	38	9 8
Blue Bantam	Ewing	59	14	8 0
English Wonder	O-9384	58	12	7 8
Pilot	Bruce	55	28	7 0
Little Marvel		59	12	6 0
Gradus	Carter	66	38	2 8

DRY OR PACKET PEAS.

Sown on May 20. Harvested on September 25.

Variety		Length of straw	Yield of shelled peas per 30-ft. row
		inches	lb.
Harrison Glory	Lincoln	42	9
Early Marrowfat	Lincoln	42	7
Black Eyed Marrowfat	Bruce	48	7
Large White Marrowfat	Ferry	48	6
Lincolnshire Small Blue		60	4

CULTURAL EXPERIMENTS WITH PEAS

Thickness of seeding	Yield per 30-ft. row
	lb. oz.
1. Seed sown in single line 3 inches apart. (1 oz.)	5 8
2. Seed sown in two lines 3 inches apart. (2 oz.)	14 0
3. Seed sown in three lines 3 inches apart. (3 oz.)	17 0

Thos. Laxton seed was used. The peas were not staked. The thickest seeding gave by far the best results.

Besides the variety and cultural experiments a pint of seedling peas was sown, and some very interesting varieties noted during the growing season, as regards quality and cropping powers. Seed was saved from eighteen plants for future tests.

LETTUCE

An experiment was tried to see how long lettuce could be kept in the fall with simple protection. The lettuce was sown on July 24, and by October all had usable heads. Cold frames were placed over the lettuce on October 19 and manure placed around the sides of the frame. Plenty of air and light was given when the plants were not frozen. At the approach of severe weather the lights were covered with a foot of litter and kept so until the plants thawed out. The following temperatures were recorded during the winter:—

November 13— 3°
December 23—13°
December 27— 5°
February 12— 7°

The plants stood these cold periods very well, and lettuce was enjoyed throughout the winter. The flavour, crispness and quality have been equal to, if not better, than heads grown during the spring and summer.

OTHER VEGETABLES

Selections of carrots, parsnips, Chinese cabbage, seedling peas, and tomatoes are being propagated in hopes of finding superior stock.

Variety tests were continued with most of the garden seeds, and the following were found to be the best adapted for conditions in Eastern British Columbia:—

Asparagus.—Palmetto is the only variety under test, and is giving satisfactory yields.

Beans.—Extra Early Valentine, Stringless Green Pod, Wardwell Kidney Wax, Plentiful French, Hodson Long Pod, Round Pod Kidney, Grennell's Rustless and Fordhook Favourite.

Beets.—Eclipse, Crosby Egyptian, Detroit Dark Red. A second seeding around July 10 has given us the best beets to store for winter.

Borecole or Kale.—Tall Green Curled.

Brussels Sprouts.—Paris Market, Dalkeith.

Cabbage.—Copenhagen Market, Early Jersey Wakefield, Early (Red) Dutch, (Savoy) Perfection Drumhead, Chinese Cabbage (Chee Fo).

Cauliflower.—Extra Early Dwarf Erfurt, Early Snowball.

Carrots.—Chantenay, Danvers, Nantes, Early Scarlet Horn.

Celery.—White Plume, Paris Golden, Easy Blanching, Evans Triumph.

Chicory.—Witloof.

Corn.—Early Malcolm, White Alberta, Malakoff, White Square Assiniboine, Nordheim Extra Early, Sweet Kloochman, Golden Bantam.

Cucumber.—Davis' Perfect, Giant Pera, Early Russian, West India Gherkin.

Endive.—Moss Curled.

Lettuce.—Grand Rapids, Black Seeded Simpson, Hanson, Iceberg, Giant Crystal Head, Salamander, Cos.

Leek.—Large Carantan, Giant Musselburgh.

Melons, Musk.—Extra Early Hackensack.

Onions.—White Barletta, Ex. Early Flat Red, Mammoth Silver King, Southport Yellow Globe, Dutch Sets, Danvers Yellow Globe.

Parsnips.—Hollow Crown.

Parsley.—Double Curled, Moss Curled.

Peas.—Lincoln, Pioneer, Advancer, Thos. Laxton, Stratagem, Excelsior, Gregory Surprise, Gradus, American Wonder, Telephone.

Potatoes.—Early Whites: Ex. Early Eureka, Irish Cobbler.
Early Reds: Early Northern, Bliss Triumph, Bermuda Early, Early Rose.
Main Crop: Gold Coin, Wee McGregor, Cambridge Russet, Ashcroft, Delaware.

Radishes.—Scarlet Turnip White Tipped, French Breakfast, Icicle (White).

Rhubarb.—Dawes Champion, Hobday's Giant, Raspberry, Linnaeus, Victoria.

Salsify.—Long White, Sandwich Island.

Swiss Chard.—Giant Lucullus.

Spinach.—Victoria, New Zealand.

Squash.—White Bush Scallop, Hubbard, Delicious, English Vegetable Marrow, Golden Hubbard.

Tomatoes.—Alacrity, Earliana, Earlibell, Bonny Best, Danish Export.

Turnips.—Extra Early Milan, Red Top Strap Leaf, Golden Ball, Early Snowball.

TREE FRUITS

It has been fairly well demonstrated that the Columbia valley is not adapted to produce tree fruits on a commercial scale. A few hardy varieties could be grown on the farms for home consumption. The following varieties have been the hardiest at the Station, and promise well for the district:—

Wealthy, Yellow Transparent, Rupert, Dudley, Okabena, Charlamoff, Pinto.

Crabs.—Hyslop, Transcendent.

SMALL FRUITS

The following varieties have been successfully grown at the Station since 1913, and can be recommended:—

Currants, Black.—Topsy, Collins' Prolific, Black Naples, Climax, Black Eagle, Victoria.
Red.—Fay Prolific, Perfection, Wilder, Rankin.
White.—White Cherry, White Grape, Large White.

Gooseberries.—Oregon Champion.

Raspberries.—Herbert.

Strawberries.—Senator Dunlap, Parson Beauty, Magoon, Superb (Everbearing).

ORNAMENTAL PLANTS

Trees.—No additions have been made to the arboretum this season. The district is largely coniferous, and some difficulty is experienced in getting deciduous trees to make a stand. The willow, poplar, ash and Manitoba maple are recommended for the district.

Hedges.—The native hedges of spruce, Douglas fir and juniper, are very good, but grow slowly. The Russian laurel-leaved willow, common lilac, Siberian dogwood and caragana grow very rapidly and make a dense hedge. The native dogwood should do as well, and a hedge of this is being set out this season.

Shrubs.—Flowering shrubs add greatly to the appearance of the place and require very little care. The lilacs, syringas, spiraeas and roses gave a profusion of bloom throughout the season.

Perennials.—The perennials made a good showing this season and gave a succession of bloom from May to freeze-up. The following list is suitable for eastern British Columbia:—

Perennial Asters,	Aquilegias,	Campanulas,
Delphiniums,	German Iris,	Gypsophilla,
Iceland Poppy,	Pæonies,	Phlox,
Pinks,	Sweet William,	Rudbeckia.
Shasta Daisy,		

Annuals.—Forty annuals were grown this season, producing bloom from early June until November. Most of the seeds were started in hotbeds early in April, and set out the second week in June. Amongst the best were the asters, antirrhinum, cosmea, marigold, nasturtium, pansy, petunia, phlox, stocks and sweet peas.

Bulbs.—Tulips made a nice showing in early spring. Bouton D'or, Couleur de Cardinal and Keizerskroon are good bedding varieties. The Darwins make a very briliant display.

Daffodils do fairly well outside, but hyacinths are poor.

FARM IMPROVEMENTS

A permanent poultry house, to accommodate one hundred birds, was erected during the year, and is giving every satisfaction.

A concrete floor was laid in the poultry administration building, and some alteration made in the partitions.

The interior of the horse stable was torn out, concrete floors put in, and the stable remodelled, giving more and better accommodation.

During the winter most of the roadways were dressed with shale, which gives a very fair surface.

No fences were erected, but the present fences required considerable repairing.

EXHIBITIONS

The circuit for the Station exhibit covered eastern British Columbia over to the Arrow lakes. Six fairs and exhibitions were attended, namely: Golden, Athalmer, Nakusp, Nelson, Creston, and Slocan City. Besides the regular exhibit, a display of potatoes grown on the Station was made. The exhibit was as educational as possible, and was well patronized at the various fairs. A great many people were helped through this medium, and about one hundred and fifty names were added to the mailing list.

VISITORS

On August 18 the first farmers' picnic was held at the Station. In the morning the farm was visited. This was followed by luncheon. In the afternoon several outside speakers addressed the farmers on timely agricultural topics. It is planned to make this an annual event.

During the summer months the Station was visited by agricultural delegates of the Imperial Press Conference and the Associated Boards of Trade of British Columbia.

Many auto tourists from the province and from the United States call in at the Station as they motor through the valley. When the Banff-Windermere road is completed we expect to have a largely increased number of visitors come to the farm each season.

MEETINGS

The following meetings were attended during the year: Western Canada Irrigation Convention, Lethbridge, Alta.; Calgary Fat Stock Show; British Columbia Dairymen's Convention, Victoria; British Columbia Seed Fair, Victoria; and British Columbia Stock Breeders' Association, Victoria.

A great many local meetings of the Farmers' Institute and Agricultural Association, Stock Breeders' Association, and Board of Trade were also attended.

The superintendent attended the Golden and Athalmer Fall Fairs, and the New Westminster Exhibition.