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 1921

First season's growth of various strains of Western Rye Grass

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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 eight years. This year opened with exceptionally mild weather for the first three months, and with a precipitation which was below the average. April was a month of strong winds and gales, which dried up the surface soil. Seeding began earlier than usual, but, owing to the lack of moisture, crops did not come along as was at first expected. The month of May was exceptionally fine and dry, and vegetation made good growth until brought to a check by frosts on the 26th and 27th of the month. June was warmer than usual, although a slight ground frost appeared on the night of the 15th. Nothwithstanding much wind and little rainfall, the outlook at the end of June was exceedingly good for all crops. July again brought five bad wind storms and but little precipitation, but nevertheless a good hay crop was harvested. During August there were high winds on seven occasions, and precipitation was again much below the average. Field crops, however, came up to standard, but insect pests seriously affected the fruit crops. September was very cool. Besides ground frosts, there were thirteen nights when the thermometer went below freezing point. The rainfall for the month was much above the average. October was a mild month, and the precipitation was slightly above normal. Strong winds continued and were especially trying during the last week of the month. After a flurry of snow on November 13, the first good fall came on the 20th, but a south wind during the last week of the month brought a thaw and stopped sleighing. In December more snow and some rain fell, and the temperature recorded was four degrees below average.

METEOROLOGICAL RECORDS

Month	Temperature			Precipitation				Tota hours sushine
	Mean	Highest	Lowest	Rain	Snow	Total	Average per month for past 8 years	
				inches	inches	inches	inches	hours
1921								
January	18·40	40	−10	0·11	8·7	0·98	1·11	58·2
February	23·39	51	− 7	0·12	6·0	0·72	0·69	103·8
March	30·32	57	− 4	0·38	2·2	0·60	0·42	153·4
April	41·53	67	18	0·38	1·1	0·49	0·70	201·3
May	50·98	77	24	0·36	–	0·36	1·44	285·6
June	58·43	81	33	1·38	–	1·38	1·57	215·8
July	61·79	88	38	0·70	–	0·70	1·45	309·5
August	59·01	88	35	0·97	–	0·97	1·45	273·4
September	47·03	69	26	2·56	–	2·56	1·21	148·1
October	42·44	69	19	0·77	–	0·77	0·70	161·4
November	26·66	55	−10	0·16	7·6	0·92	0·58	64·7
December	10·11	42	−30	0·42	4·2	0·84	1·01	68·4
Totals	.....	.....	.....	8·31	29·8	11·29	12·33	2,043·6

Precipitation for the six growing months, April-September, 1921, 6·46".
Average precipitation for the six growing months, for the past eight years, 7·85".
Highest temperature recovded at the Station—95° on July 31 and Aug. 1, 1914.
Lowest temperature recorded at the Station—34° on Jan. 12, 1916 and Dec. 12, 1919

ANIMAL HUSBANDRY

Live stock work at this Station is carried on only insofar as the supply of labour and animal products for farm consumption would warrant. No experimental work has been attempted with any class of stock, largely owing to limitations in the way of land, equipment and facilities generally.

Three horses are kept—a work team and a driver. No breeding has been attempted.

Two milch cows are kept to supply the requirements of the Station.

A Berkshire sow and boar are kept, the services of the latter being available to farmers.

While there is little prospect of experimental work of importance being carried on in Animal Husbandry at this Station, it is planned to maintain in the future a good draught stallion, a high class bull of one of the beef breeds and a good boar of one of the bacon breeds, together with a limited number of pure bred cows. The use of these pure bred sires will be available to breeders and stockmen in the district.

FIELD HUSBANDRY

ROTATIONS—IRRIGATED LAND

Three rotations are being conducted on irrigated land, viz:—

Rotation A.—A four-year rotation: Hoed crops (roots)—wheat—peas—oats.

Rotation B.—A five-year rotation: Wheat—roots—oats seeded to clover—clover—clover.

Rotation J.—A three-year rotation: Oats seeded to clover—clover—potatoes.

Records of all costs of production have been kept; also the returns per acre at current market prices. The rates used in figuring the results for 1921 are as follow:—

Rent of land, per acre	$5 00
Manure, per ton over period of rotation	1 00
Machinery, per acre	0 80
Seed grain, per pound	0 03
Seed peas, per pound	0 06
Seed potatoes, per ton	40 00
Seed clover, per pound	0 47
Twine, per pound	0 20
Two-horse team and man, per hour	0 60
One-horse team and man, per hour	0 50
Manual labour, per hour	0 35
Threshing, per bushel	0 10

RETURN VALUES

Hay, per ton	$30 00
Grain, per pound	0 03
Peas, per pound	0 06
Roots, per bushel	0 20
Potatoes, per ton	40 00
Straw, per ton	8 00

The following tables give the detailed figures for 1921, both of costs and returns:—

ROTATION RECORD "A"—FOUR YEARS

Rotation year	Crops: Last year	Crops: This year	Area	Items of Expense in Raising Crop: Rent and Manure	Seed, twine and use of machinery	Manual labour: Hours Manual labour	Manual labour: Cost of Manual Labour	Horse labour (including teamster): Hours: Single horse	Horse labour (including teamster): Hours: 2 horse team	Horse labour (including teamster): Value of horse labour	Cost of threshing	Total cost	Cost for 1 acre	Particulars of Crop: Weight: Grain	Weight: Straw	Weight: Hay	Weight: Hoed crop	Total value	Value of crop per acre	Profit or loss per acre
			acres	$ c.	$ c.	No.	$ c.	No.	No.	$ c.	$ c.	$ c.	$ c.	lb.	lb.	lb.	lb.	$ c.	$ c.	$ c.
3	Peas	*Barley for Hay	½	6 50	1 66	5	1 75	.....	10	6 00	.....	15 91	31 82	.....	.....	1,764	.....	26 46	52 92	21 10
2	Wheat	Peas	½	6 50	3 58	15	5 25	.....	8	4 80	1 40	21 53	43 06	827	.....	.....	.....	49 62	99 24	56 18
1	Roots	Wheat	½	6 50	2 15	6	2 10	0·3	6	3 72	1 70	16 17	32 34	1,020	1,758	.....	.....	37 63	75 26	42 92
4	Oats	Roots	½	6 50	2 45	53	18 55	1·4	6·75	4 75	.....	32 25	64 50	.....	.....	.....	10,870	36 20	72 40	7 90
Aggregate			2	26 00	9 84	79·0	27 65	1·7	30·75	19 27	3 10	85 86	.....	.....	.....	.....	.....	.....	.....	.....
Average per acre 1921			.....	13 00	4 92	39·5	13 83	·85	15·38	9 64	1 55	.....	42 93	.....	.....	.....	.....	149 91	.....	.....
Average per acre for 4 years			.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	74 95	32 02

*Success barley was sown for hay as the plot was very dirty with weeds.
The peas were badly damaged at the end of the season by cutworms.

ROTATION RECORD "B"—FIVE YEARS

Rotation year	Crops: Last year	Crops: This year	Area	Items of Expense in Raising Crop: Rent and Manure	Seed, twine and use of machinery	Manual labour: Hours Manual labour	Manual labour: Cost of Manual Labour	Horse labour (including teamster): Hours: Single horse	Horse labour (including teamster): Hours: 2 horse team	Horse labour (including teamster): Value of horse labour	Cost of threshing	Total cost	Cost for 1 acre	Particulars of Crop: Weight: Grain	Weight: Straw	Weight: Hay	Weight: Hoed crop	Total value	Value of crop per acre	Profit or loss per acre
			acres	$ c.	$ c.	No.	$ c.	No.	No.	$ c.	$ c.	$ c.	$ c.	lb.	lb.	lb.	lb.	$ c.	$ c.	$ c.
1	Wheat	Roots	½	5 96	2 55	56	19 60	1·4	7·75	5 35	.....	33 46	66 92	.....	.....	.....	13,252	44 20	88 40	21 48
2	Roots	Oats	½	5 96	2 57	5·3	1 86	0·3	5	3 15	3 10	16 64	33 28	1,034	1,554	.....	.....	37 23	74 46	41 18
3	Oats	Clover	½	5 96	3 10	2	0 70	0·3	8	4 95	.....	14 71	29 42	.....	.....	.....	.....	.....	.....	−29 42
4	Clover	Clover	½	5 96	4 00	2·3	0 82	0·3	8	4 95	.....	15 73	31 46	.....	.....	.....	.....	.....	.....	−31 46
5	Clover	Wheat	½	5 96	2 15	7·5	2 83	0·3	5·25	3 30	2 60	16 84	33 68	1,525	2,400	.....	.....	55 35	110 70	77 02
Aggregate			2½	29 80	14 37	73·1	25 81	2·6	34·00	21 70	5 70	97 38	.....	.....	.....	.....	.....	136 78	.....	.....
Average per acre 1921			.....	11 92	5 75	29·2	10 32	1·04	13·6	8 68	2 28	.....	38 95	.....	.....	.....	.....	.....	54 71	15 76
Average per acre for ..... years			.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

ROTATION RECORD "J"—THREE YEARS

Rotation year	Crops: Last year	Crops: This year	Area	Rent and Manure	Items of Expense in Raising Crop: Seed, twine and use of machinery	Manual labour: Hours Manual labour	Manual labour: Cost of Manual Labour	Horse labour (including teamster): Hours: Single horse	Horse labour (including teamster): Hours: 2 horse team	Horse labour (including teamster): Value of horse labour	Cost of threshing	Total cost	Cost for 1 acre	Particulars of Crop: Weight: Grain	Weight: Straw	Weight: Hay	Weight: Hoed crop	Total value	Value of crop per acre	Profit or loss per acre
			acres	$ c.	$ c.	No.	$ c.	No.	No.	$ c.	$ c.	$ c.	$ c.	lb.	lb.	lb.	lb.	$ c.	$ c.	$ c.
1	Potatoes	Oats	¼	2 50	2 86	3·5	1 23	.....	2·25	1 35	1 70	9 64	38 56	536	822	.....	.....	19 36	77 44	38 88
3	Clover	Potatoes	¼	2 50	10 22	55·5	19 43	1·5	6·3	4 53	.....	36 68	146 72	.....	.....	.....	5,314	106 28	425 12	278 40
2	Oats	Clover	¼	2 50	20	4	1 40	0·5	4	2 65	.....	6 75	27 00	.....	.....	470	.....	7 05	28 20	1 20
Aggregate			¾	7 50	13 28	63	22 06	2	12·55	8 53	1 70	53 07	.....	.....	.....	.....	.....	132 69	.....	.....
Average per acre 19			.....	10 00	17 71	84	29 41	2·7	16·73	11 37	2 26	.....	70 76	.....	.....	.....	.....	.....	176 92	106 16
Average per acre for ..... years			.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Table showing profit per acre for the past three years:—

	1919	1920	1921	Average
Rotation A..	$ 73 53	$ 12 24	$ 32 02	$ 39 15
" B..	35 81	43 11	15 76	31 89
" J..	232 84	186 41	106 16	175 13

The returns from the rotations clearly demonstrate the advisability of having special cash crops in the rotation. The district is particularly adapted to growing potatoes, peas and hay crops, and another year the rotations are being altered so as to combine more mixed farming features in conjunction with cash crops.

IRRIGATION ON ROTATION A

Project No. 11a.

Flumes and weirs deliver the water to each plot, and careful measurement is taken of the amount of water applied, and the waste. The following table gives a summary of the results for the past eight years:—

IRRIGATION TABLE

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.....	13·36	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.....	11·35	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.....	9·96	5·14	6·12	13·17	10·04	7·46	9·19
1920.....	10·45	5·81	14·06	8·51	6·61	7·73	9·23
1921.....	11·29	6·46	11·41	11·54	8·62	12·58	11·04
Average amount of water used per acre, in acre-inches.....			9·00	8·12	8·16	6·98	8·07

CULTURAL EXPERIMENT

Project No. 51.

—	Yields in bushels, per acre					
	1917	1918	1919	1920	1921	Average five years
Oats continuously—Manured 12 tons per year....	40·7	25·4	85·3	82·0	52·9	57·2
Oats seeded to clover and clover ploughed in.....	25·4	23·3	67·8	31·8	31·8	36·0
Oats—Summer-fallow.....	38·4	13·0	54·0	37·0	46·6	37·8
Oats continuously.....	34·7	22·5	43·5	38·8	26·2	33·3

The cultural test with oats is proving very interesting, and shows conclusively the value of barnyard manure on the crop yields. In connection with the green manure it is just possible that more may be ploughed under than can be rotted before the next season. This may leave the ground too open, and so reduce the yields during the following season.

While the "Oats—Summer-fallow" in the preceding table show a higher yield than "Oats continuously," and where the clover was ploughed under, it must be borne in mind that it takes two years, or twice the amount of land, to produce these results. The yields, then, on a yearly basis should be cut in half. This clearly shows that summer-fallow is not advisable on irrigated land.

FERTILIZER EXPERIMENT

Project No. 52.

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-year rotation is followed, namely: Potatoes, oats seeded to clover, clover.

Due to the clover winter-killing in the winter of 1920-21, and to subsequent washing of the land in the spring, the results of this experiment are "nil" for this season. The land was ploughed, levelled and seeded to barley, and the experiment will be continued another year.

HORTICULTURE

VEGETABLES

VARIETY TEST OF ASPARAGUS (PALMETTO)

Project No. 81.

This was planted in 1914 and is now in full bearing. The first cutting was taken on April 25, and cuttings continued until June 15, a heavy crop being harvested.

VARIETY TESTS OF TABLE BEETS

Project No. 38.

Eight varieties were sown on May 18 in rows 2½ feet apart. The plants were thinned, and results obtained as follows:—

TABLE BEETS—TEST OF VARIETIES

Variety	Source	Yield from 30-ft. row	Remarks
		lb.	
Crimson Globe	McDonald	90	Poor colour and quality.
Detroit Dark Red	"	80	Good, but mixed.
Cardinal Globe	Rennie	80	Poor colour and quality.
Black Red Ball	0–245	75	Poor quality.
Crosby Egyptian	Harris	75	"
Extra Early	McKenzie	70	Fair quality. Mixed type.
New Danby	Steele	65	Very poor. Ran to seed.
Detroit Dark Red	0–200	60	Very good quality. True type.

LATE SEEDING OF BEETS FOR WINTER USE

Project No. 38.

A seeding of beets was made on July 5 and July 12. Those planted on July 5 reached an average of 2 inches in diameter, which is a first-rate size for table use. Those planted at the later date were considerably smaller.

VARIETY TESTS OF GARDEN BEANS

Project No. 38.

Ten varieties of beans were sown on May 30, in rows 2½ feet apart. The following table summarizes the results. It is impossible to mature beans at this Station:—

GARDEN BEANS—TEST OF VARIETIES

Variety	Source	Ready for use	Weight from 30-ft. row
			lb.
Plentiful Bush	Gregory	Aug. 1	20¾
Ex. Early Valentine	Rennie	" 6	19½
Plentiful French	0–591	" 1	18½
Webber Wax	Harris	" 1	18¼
Davis White Wax	McDonald	" 6	14½
Masterpiece	0–589	" 6	12¾
Stringless Green Pod	Rennie	" 6	9¾
Pencil Pod Black Wax	McDonald	" 6	7¾
Refugee	Carter	Sept. 10	3¾
Round Pod Kidney Wax	McDonald	Aug. 11	2½

VARIETY TEST OF BROAD BEANS

Project No. 38.

One variety (the Harlington) was sown on May 16 and was ready for use on August 8, yielding 19½ pounds per 30-foot row.

VARIETY TEST OF BORECOLE

Project No. 38.

One variety (Tall Green Curled) was sown on May 18, and made excellent growth by the end of the season.

VARIETY TEST OF BRUSSELS SPROUTS

Project No. 38.

Two varieties (Dwarf Gem and Dalkeith) were sown on May 18. Owing to the shortness of the season no sprouts matured.

VARIETY TEST OF CABBAGE

Project No. 38.

Ten varieties were sown in the open on May 18. Some trouble was experienced with cabbage moth, but good results were obtained, as shown by the following table:—

CABBAGE—TEST OF VARIETIES

Variety	Source	Ready for use	Weight per 30-ft. row
			lb.
Copenhagen Market	McDonald	Aug. 20	108
Flat Swedish	Lennox	Sept. 9	104
Chester Savoy	Steele	Oct. 1	103
Jersey Wakefield	McDonald	Aug. 20	80
Kildonan	Steele	Oct. 12	80
Brandon Market	McKenzie	" 5	78
Delicatesse	0–842	" 12	73
Amager Danish Ballhead	0–105	" 12	75
North Favourite	McKenzie	" 1	60
Danish Red Stonehead	Ewing	" 12	60

Late Seeding of Cabbage for Winter Storage.

Project No. 38a.

Two late sowings of Copenhagen Market were made on June 1 and June 10 to ascertain the best time for sowing for winter storage. The first sowing produced the best results, and yielded 80 pounds of fine solid trimmed heads. The later sowing did not produce solid heads.

Variety Test of Chinese Cabbage

Project No. 38.

Three varieties were sown on May 18, namely Pe Tsai, Wong Bok and an Invermere selection. They all matured at the same time but Pe Tsai proved not quite so hardy, as it was touched by a late frost.

VARIETY TEST OF CAULIFLOWER

Project No. 38.

Two varieties (Early Snowball and Extra Early Dwarf Erfurt) were sown in the open on May 18. The former was ready for use on August 10 and the latter on August 15. Early Snowball outyielded the Erfurt.

Successive sowings of cauliflower to determine length of season

Project No. 38b.—Plants from hot-bed were set out on June 4, while sowings were made on May 18, June 1 and 10. Cauliflowers from the pricked out plants were ready on July 12; from May 18 sowing on August 13; and from June 1 sowing on September 3. The June 10 seeding did not mature.

VARIETY TEST OF CHICORY

Project No. 38.—The Witloof variety was sown on May 18 in the open, and made good growth during the season.

VARIETY TEST OF CARROTS

Project No. 38.—Eight varieties of carrots were sown on May 19. They were harvested on October 2, with the following results:—

GARDEN CARROTS—TEST OF VARIETIES

Variety	Source	Ready for use	Size	Weight per 30-ft. row
				lb.
Garden Gem	McKenzie	Aug. 1	M	92
Hutchinson	Gregory	" 1	L	89
Improved Danvers	D. & F.	" 1	L	82
Chantenay	0-246	" 1	M	82
Chantenay	Invermere	" 1	M	78
Select Chantenay	McDonald	" 1	M	77
Early Scarlet Horn	D. & F.	July 25	M	76
Half Long Scarlet Nantes	D. & F.	Aug. 1	M	55

VARIETY TEST OF CELERY

Project No. 38.—Six varieties of celery were transplanted to the open on June 9. Sanford Superb and Easy Blanching had the best quality.

CELERY—TEST OF VARIETIES

Variety	Ready for use	Size	Yield per 30-ft. row
			lb.
Easy Blanching	Aug. 15	M	51
Sanford Superb	" 15	M	50
French Success	" 20	M	50
Winter Queen	Sept. 1	M	47
Golden Self Blanching	Aug. 15	M	50
White Plume	" 1	S	22

METHOD OF BLANCHING CELERY

Project No. 38c.—Three methods of blanching celery were tried out, viz.:—(1) wrapping plants with building paper; (2) plants enclosed with boards; (3) plants banked with soil. Wrapping with paper blanched the celery, but it lacked in crispness. With the boards the celery was fairly well blanched, but the heads were loose. Blanching by banking with soil gave the best results, and the celery was crisp and nutty.

VARIETY TEST WITH GARDEN CORN

Project No. 38.—Ten varieties were sown on June 1, when danger from frost was over. On account of the short season only the following very early varieties produced cobs: White Alberta, Sweet Squaw 0-622-626, Picaninny 0-871-876; Kloochman 0-896; and Early Malcolm.

VARIETY TEST OF CUCUMBERS

Project No. 38.—Three varieties were sown in the open on June 6, and the Early Russian variety was the only one to produce fruit on account of the short season.

VARIETY TEST OF ENDIVE

Project No. 38.—The Moss Curled endive was sown in the open on May 6, and made vigorous growth throughout the season. It was bleached by covering with boards.

VARIETY TEST OF KOHL RABI

Project No. 38.—Two varieties (Early White and Early Purple) were sown on May 25. They were ready for use on August 1, the former out-yielding the latter.

VARIETY TEST OF LETTUCE

Project No. 38.—Nine varieties were tested out this season. They were sown in the open on May 18. The following table summarizes the results:—

LETTUCE—TEST OF VARIETIES

Variety	Source	Type	Ready for use	Weight per 30-ft. row	Remarks
				lb.	
Iceberg	Ewing	Cabbage	July 20	70	Very good.
New York	Bruce	"	" 24	70	Stands up well.
Curled Simpson	Ewing	Loose	" 22	65	" "
Hanson	"	Cabbage	" 20	60	A favourite here.
Grand Rapids	0-232	Loose	" 15	60	Good.
Cos	D. & F.	Cos	" 25	50	Good when tied.
Earliest Wayahead	D. & F.	Cabbage	" 4	30	Ran to seed badly.
Sutton Ex. Early Paris Market	0-845	Loose	" 4	30	Ran to seed.
Crisp-as-Ice	Oscar	Cabbage	" 8	25	Rots in centre badly.

VARIETY TEST OF LEEKS

Project No. 38.—One variety (Monstrous Carentan) was tried out, but the season is far too short for this vegetable.

VARIETY TEST OF MUSK MELON

Project No. 38.—Two varieties (Hoodoo and Extra Early Hackensack) were sown on June 6, when danger from frost was past. The season was too short, no fruit being produced.

VARIETY TEST WITH ONIONS

Project No. 38.—Nine varieties of onions were sown on May 19. Our season is far too short successfully to mature onions; also the maggot was greatly in evidence. The most promising variety is the White Barletta, and this variety seems to be more immune from attack by the onion maggot than the other varieties.

CREOLIN AS A PREVENTATIVE OF ONION MAGGOTS

Project No. 38d.—A mixture of creolin and sand was sown in the drills along with the onion seed, and some scattered among the plants each week during the season. The results obtained were partially successful, and further trials will be made. It was noticed that the creolin had a marked influence on encouraging a vigorous growth of the plants.

VARIETY TEST OF PARSNIPS

Project No. 38.—Two varieties (First Ripe O-104 and an Invermere selection) were tested. The latter out-yielded the former by 10 pounds in a 30-feet row.

VARIETY TESTS OF PARSLEY

Project No. 38.—Seventeen varieties of garden peas were sown on May 16. The excellent growth this season.

VARIETY TEST OF GARDEN PEAS

Project No. 38.—Seventeen varieties of garden peas were sown on May 16. The germination in some varieties was very poor, which accounts for the reduced yields. An Invermere selection (The Lincoln) heads the list. It is very prolific; large, sweet and tender.

GARDEN PEAS—TEST OF VARIETIES

Variety	Source	Germination	Ready for use	Yield of pods 30-ft. row
				lb.
Lincoln	Invermere	Good	July 28	24½
English Wonder	0-89291	Fair	" 25	23
McLean Advancer	0-8927	Good	" 28	20
" "	Bruce	"	" 28	18½
Reliance	Steele Briggs	Poor	Aug. 1	16
Sutton Excelsior	Harris	"	July 22	15½
Pioneer	Gregory	Good	" 16	14½
Early Morn	McDonald	Fair	" 16	13
Thos. Laxton	Invermere	"	" 15	12½
Little Marvel	Graham	Poor	" 20	12¼
Thos. Laxton	McDonald	Fair	" 15	12
Laxtonian	Graham	Poor	" 25	11
Eight Weeks	Carter	Fair	" 15	9½
Danby Stratagem	"	Poor	Aug. 1	8½
2360	Sidney, V.I.	Fair	July 22	8
Juno	Bogliano	Poor	Aug. 2	7¼
Gradus	Carter	"	July 20	4½

Variety test of Dry Peas

Project No. 38.—Three varieties were sown on May 16, and the dry shelled weights obtained were:—

Variety	Source	Germination	Date ripe	Yield per 30-ft. row
				lb.
Harrison Glory	Invermere	Fair	Sept. 10	8
Early Marrowfat	"	"	" 3	7
Lincoln	"	Good	Aug. 29	7

CULTURAL TEST. RATE OF SEEDING OF PEAS

Project No. 38e.—Four rates of seeding were used in this test, running from one to four ounces per 30-foot row. The Thos. Laxton variety was used, and the following summarizes the results and shows a distinct advantage for heavy seeding up to 3 ounces:—

Rate of seeding	Date sown	Ready for use	Yield per 30-ft. row
			lb.
1 oz	May 16	July 28	5½
2 oz	" 16	" 28	7¾
3 oz	" 16	" 28	18¼
4 oz	" 16	" 28	11½

Selection of Seedling Peas

Project No. 38f.—From fifteen seedling peas that were selected last season, five have shown up as very promising. A supply of seed has been saved from all the seedlings, and another season they will be tested out against standard varieties.

Breeding work with Peas

Project No. 38g.—This past season successful crosses were made, and seed was obtained from the following:—

Pioneer x Thos. Laxton.
Pioneer x Lincoln.
Reliance x Lincoln.
Reliance x Thos. Laxton.
Lincoln x Arthur.

VARIETY TEST OF PEPPERS

Project No. 38.—One variety (Harris' Earliest) was sown in the hot-bed on April 4 and transplanted on June 15. An excellent crop of green peppers was produced.

VARIETY TEST OF POTATOES

Project No. 38.—Twenty-eight varieties of potatoes were planted on May 26, a foot apart in the rows, and the rows 2½ feet apart. They were harvested on September 29. The following table summarizes the results, and again goes to show the opportunities for potato growing in the Valley:—

POTATOES—TEST OF VARIETIES

Variety	Source	Yield per 30-ft. row			Yield per acre	
		Marketable	Culls	Total		
		lb.	lb.	lb.	ton	lb.
Wee McGregor	Invermere	134	4	138	40	178
Irish Cobbler	Lethbdge '20	124	9	133	38	1,273
Delaware	Invermere	107	5	112	32	1,072
Late Puritan	"	96	13	109	31	1,329
Ashcroft	"	94	14	108	31	748
Irish Cobbler	"	96	8	104	30	424
Gold Coin	"	96	5	101	29	681
Bovee	"	90	6	96	27	1,776
Cambridge Russet	Jones	84	11	95	27	1,195
Gold Coin	Lethbdge '20	89	6	95	27	1,195
Peacock Surprise	Brandon	81	13	94	27	614
Gold Coin	Lethbdge '21	87	5	92	26	1,452
Netted Gem	Marples	76	12	88	25	1,128
Sutton Abundance	Invermere	80	6	86	24	1,966
Early Six Weeks	"	73	13	86	24	1,966
Carman No. 1	"	76	8	84	24	814
Manistee	"	74	8	82	23	1,642
Early Rose	"	72	10	82	23	1,642
Netted Gem	Meggitt	68	13	81	23	1,061
Silver King	Invermere	74	7	81	23	1,061
Bermuda Early	"	64	13	77	22	737
Houlton Rose	"	67	10	77	22	737
Snow	"	63	12	75	21	1,575
Cambridge Russet	"	62	12	74	21	994
Early Norther	"	67	7	74	21	994
Extra Early Eureka	"	58	14	72	20	1,832
Early Ohio	"	58	13	71	20	1,251
Sir Walter Raleigh	"	64	6	70	20	620

On account of the alkaline soils which are prevalent in the district ,the russet type of potato may be recommended as being quite scab resistant. Under this class of potato comes the Netted Gem, the Cambridge Russet and the Peacock Surprise.

Cultural Tests With Potatoes

Project No. 38h.—To determine the best distance apart to plant potatoes in the rows. Two ounce sets (Wee McGregor) were used and planted 12, 14, 16, 18, 20 and 22 inches apart in the rows. The following table summarizes the results, and distinctly shows the advisability of planting about a foot apart. The row planted 14 inches apart were very scabby and this possibly reduced the yield:—

POTATOES PLANTED AT DIFFERENT DISTANCES

Distance apart in rows	Weight of Potatoes per 90-ft. row		
	Marketable	Culls	Total
	lb.	lb.	lb.
12 inches	220	15	235
14 "	151	16	167
16 "	190	11	201
18 "	172	13	185
20 "	158	6	164
22 "	152	6	158

Project No. 38i.—To determine the size of potato sets that would give the best results.

One, two, three and four-ounce sets were planted 12 inches apart in the rows, with the rows 30 inches apart. The potatoes lifted from the two-ounce sets were quite scabby, which possibly reduced the yields. While the table shows that an increased yield was obtained from sets up to 4 ounces, still very satisfactory yields are obtained from the smaller sets.

SIZE OF POTATO SETS

Size of Set	Weight of Potatoes per 30-ft. row		
	Marketable	Culls	Total
	lb.	lb.	lb.
1 oz	157	7	164
2 oz	154	9	163
3 oz	171	15	186
4 oz	192	23	215

TESTS TO ASCERTAIN THE VALUE OF A CHANGE OF SEED

Project No. 38j.—Seed potatoes from various sources were tried out against seed grown here for nine years. The following table summarizes the results, in some cases showing an increase, and in others a loss in yield:—

TESTS OF CHANGE OF SEED

Variety	Source	Yields in lb. per 30-ft. row		
		Marketable	Culls	Totals
Gold Coin	Invermere—9 years	96	5	101
Gold Coin	Lethbridge, 1920, grown here one year	89	6	95
Gold Coin	Lethbridge, 1921	87	5	92
Irish Cobbler	Invermere—9 years	96	8	104
Irish Cobbler	Lethbridge, 1920, grown here one year	124	9	133
Cambridge Russet	Invermere—9 years	62	12	74
Cambridge Russet	Jones, 1921	84	11	95

TEST TO ASCERTAIN THE DIFFERENCE BETWEEN PLANTING THE FRONT AND HIND QUARTERS OF SEED POTATOES

Project No. 38k.—The difference in yield was so small as to make comparisons difficult:—

	Yield in lb. per 30-ft. row		
	Marketable	Culls	Totals
Cambridge Russet—Front quarter	84	11	95
Cambridge Russet—Hind quarter	87	6	93

TEST TO COMPARE PERFECTLY SHAPED SEED WITH THE WORST SHAPED SEED

Project No. 38l.—Uniform smooth seed of equal size was selected from perfectly shaped seed; and the worst possible specimens were selected to try out against them. The yields were fairly close, and if anything the ill-shaped tubers produced just as good as, or better shaped tubers than, the perfectly shaped seed.

TO DETERMINE THE EFFECT OF CREOLIN AS A SOIL FUMIGANT IN THE CONTROL OF POTATO SCAB

Project No. 38m.—Scabby potatoes of the Wee McGregor variety were taken.

Row No. 1.—The drills were treated with sand impregnated with creolin, the potatoes not being treated.

Row No. 2.—Soil and seed not treated.

Row No. 3.—Soil not treated, but tubers treated with formalin.

The sets were planted 12 inches apart, in rows 2½ feet apart. The results showed that tubers in all tests had a certain amount of scab, the row treated with creolin being the least affected. The creolin seemed to have a stimulating effect on the growth and vigour of the potato vine and tuber.

Test	Yield in lb. per 60-ft. row		
	Marketable	Culls	Totals
Soil treated with creolin	127	8	135
Untreated	69	14	83
Treated with formalin	70	10	80

VARIETY TEST OF RADISH

Project No. 38.—One variety (Scarlet Turnip) from two sources was sown this season on May 16, and was ready for use on June 7th. Both varieties were quite true to type.

VARIETY TEST OF RHUBARB

Project No. 38.—This season several of our own selections were planted on May 11th. All made strong, vigorous growth throughout the season. The selections were from Dawes' Champion, Hobday, Giant and Raspberry.

Forcing Rhubarb in Cellar During Winter Months.

Project No. 38n.—In May old stools of rhubarb were broken up into sets, and planted in well-manured ground during the summer. By autumn the crowns were in

good shape and were lifted and packed in a cellar which was not frost proof. As needed, the crowns were taken and packed tightly in boxes, in moss, well watered, and placed in the furnace room of the basement. With this method there was a succession of very fine rhubarb from December 22nd until May 1, when the garden rhubarb could be obtained.

VARIETY TEST OF SALSIFY

Project No. 83.—One variety (Long White O-252) was sown on May 25, and developed to medium size during the season, yielding 17 pounds per 30-foot row.

VARIETY TEST OF SWISS CHARD

Project No. 38.—One variety (Long White O-252) was sown on May 25, with excellent results. This crop does very well on our alkaline soils.

VARIETY TEST OF SPINACH

Project No. 38.—Three varieties (Broad Flanders, Victoria and New Zealand) were sown on May 16. The first two were ready for use on July 1, and the third on July 20. The New Zealand continued to make a heavy growth until killed by frost.

VARIETY TEST FOR FORCING SEA KALE

Project No. 38.—Planted on May 25, and made strong crowns for forcing by the end of the season.

Forcing Sea Kale in Cellar During Winter Months

Project No. 38o.—Sea Kale thongs were planted in soil in May. They were lifted in the fall and stored in moss in the cellar, which was not frost proof. Roots were planted in moss, in boxes, and forced in the furnace basement. By this method sea kale was enjoyed from early in January until April.

FORCING CHICORY IN CELLAR IN WINTER MONTHS

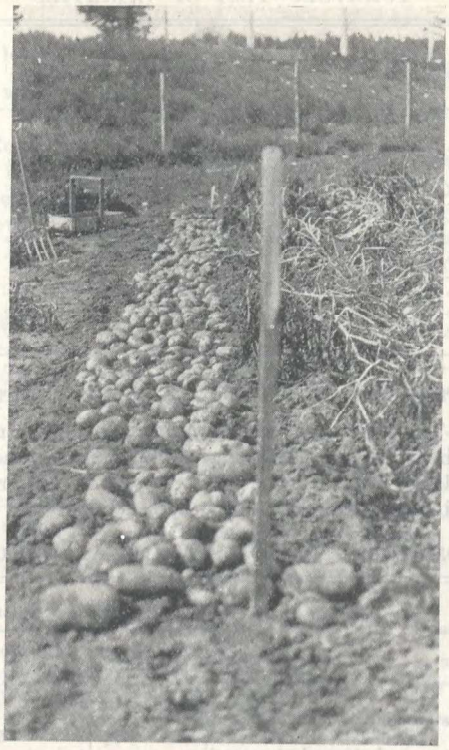
Project No. 38p.—Similar treatment to that for forcing sea kale was given to chicory, and greens were enjoyed throughout the winter months.

VARIETY TEST OF SQUASH

Project No. 38.—Six varieties were sown on June 6 and made good growth, but were cut by frost just as they were in full bearing. English Vegetable Marrow gave the largest yields.

VARIETY TEST OF TOMATOES

Project No. 38.—Eleven varieties of tomatoes were sown in the hot-bed on April 4 and transplanted to the garden on June 13. They are trained to a single stem and stopped after the second truss of fruit had formed. Early frosts considerably reduced the crop.



Variety test. Wee McGregor, 138 pounds, from 30-inch row. Sets 12 inches apart.

Danish Export. (Wiboltt), staked and stopped at second truss.

TOMATOES—TEST OF VARIETIES

Variety	Source	Date of first ripening	No. of fruits to 1 lb.	Total yield from ten plants
				lb.
Crimson Canner	O–707	Aug. 26	4	16¼
Chalk's Early Jewel	Carter	" 12	3	15¾
Danish Export	Wiboltt	" 20	6	15
Alacrity X Hipper	O–709	" 22	4	13¾
Bonny Best	O–719	" 16	4	13
Danish Export	O–722	" 16	7	12½
Earlibell	O–734	" 7	4	10½
Chalk's Jewel	O–710	" 26	5	10½
Alacrity X Earlibell	O–711	" 22	4	7½
Burbank Early	O–732	" 10	4	7½
Alacrity	O	" 22	4	5¼

CULTURAL TEST IN STAKING AND PRUNING TOMATOES

Project No. 38q.—The following table summarizes a pruning test of tomatoes. It is essential to prune the plants to produce ripe fruit in our short season. Under the first two systems the plants require to be set at least a foot apart in the rows. Nos. 3, 4, 5, and 6 require 18 inches, while No. 7 requires about 4 feet each way.

TOMATOES—TEST OF STAKING AND PRUNING

Test	Yields per plant in lb. of ripe fruit			
	Alacrity	Bonny Best	Danish Export	Average
1. Plant trained to single stem and stopped at first truss of fruit	1½	5	3¼	3¼
2. Plant trained to single stem and stopped at second truss of fruit	1½	4½	2½	2⅝
3. Plant trained to single stem and stopped at third truss of fruit	1¾	3	2½	2 5/12
4. Plant stopped in hot frame, 3 side shoots allowed to develop and stopped at first truss of fruit on each				
5. Plant stopped in the open, two side shoots allowed to develop and stopped at first truss of fruit on each	3¼	3½	1¾	2⅝
6. Plant stopped in the open, three side shoots allowed to develop and stopped at first truss of fruit on each	2¾	3¾	1¾	2¾
7. Naturally grown				

It will be noted in the above that there is a great difference between varieties, and the same methods will not be equally effective on all. The test clearly shows that it pays to stake and prune. This season, with the late and early frosts, the plants trimmed to the single truss gave the highest yield of ripe fruit.

VARIETY TEST OF GARDEN TURNIPS

Project No. 38.—Four varieties were sown on May 26, in rows 2½ feet apart, with the following results:—

Variety	Source	Ready for use	Totalweight 30-ft. row
			lb.
Early Snowball	McDonald	July 15	67
Golden Ball	"	" 22	60
Red Top Strap Leaf	"	" 13	55
Ex. Early Purple Top Milan	"	" 10	50

FRUITS

VARIETY TEST OF APPLES

Project No. 55.—Results have demonstrated that the Valley is not particularly adapted to the growing of apples on a commercial scale. Hardy varieties may, however, be grown for home use, and the following have proved the most reliable at the Station: Wealthy, Yellow Transparent, Rupert, Dudley, Okabena, Charlamoff, Pinto. Of the crab apples, Hyslop and Transcendent are to be recommended.

VARIETY TEST OF RED CURRANTS

Project No. 36.—Red currants have been grown since 1913. Last season a new plantation was started. The following varieties have been the most prolific and hardy: Fay Prolific, Perfection, Wilder and Rankin.

VARIETY TEST OF BLACK CURRANTS

Project No. 36.—Black currants have been tried out since 1913. Last season a new plantation was started. The varieties to be recommended are: Topsy, Collins Prolific, Naples, Climax, Black Eagle, Victoria.

VARIETY TEST OF WHITE CURRANTS

Project No. 36.—Since 1913 currants have been grown quite successfully. A new plantation was started last year. The following varieties are the best adapted to the district: White Cherry, White Grape, Large White.

VARIETY TEST OF GOOSEBERRIES

Project No. 36.—Gooseberries have been tried since 1913, a new plantation being set out this year. Oregon Champion is recommended.

VARIETY TEST OF RASPBERRIES

Project No. 36.—Raspberries have been grown since 1913. The Cuthbert has been badly winter-killed some years. Herbert and King are to be recommended.

VARIETY TEST OF STRAWBERRIES

Project No. 37.—Several varieties of strawberries have been tried since 1913. The following have proved the best adapted to the district: Senator Dunlop, Parson Beauty, Magoon, Superb (Everbearing).

ORNAMENTAL PLANTS

VARIETIES OF TREES SUITABLE FOR PLANTING

Project No. 53.—The district is largely coniferous, but the following deciduous trees are to be recommended: Willow, Poplar, Ash, Manitoba Maple.

VARIETY TEST OF HEDGES

Project No. 35.—The Spruce, Juniper and Douglas Fir hedges are good, but grow slowly. The deciduous hedges which will mature more quickly are Laurel-leaved Willow, Common Lilac, Dogwood and Caragana.

VARIETY TEST OF FLOWERING SHRUBS

Project No. 34.—Flowering shrubs require very little care, and improve the appearance of any place. Lilacs, spiraeas, syringas and roses gave a great profusion of bloom throughout the season.

VARIETY AND STRAIN TEST OF PERENNIALS

Project No. 34.—One hundred and thirty-six varieties and strains of perennials were on test last season. The following list is admirably adapted for eastern British Columbia conditions:—

Perennial Aster, Aquilegia, Campanula, Delphinium, Iris, Gypsophilla, Iceland Poppy, Pæony, Phlox, Pink, Sweet William, Rudbeckia, Shasta Daisy.

VARIETY AND STRAIN TEST OF ANNUALS

Project No. 34.—One hundred and fifty varieties and strains of annuals were tried out this season. Most of them were started in hotbeds and transplanted during early June. There was a profusion of bloom during the entire season until early November. The following list contains some of the most satisfactory varieties: Aster, Antirrhinum, Clarkia, Cosmea, Datura, Lobelia, Linaria, Marigold, Nasturtium, Petunia, Phlox, Poppy, Portulaca, Salpiglossis, Stock, Tagetes, Zinnia, Pansy, Sweet Pea.

TEST OF BULBS FROM HOLLAND

Project No. 54.—Twenty varieties of single tulips, thirty of Darwins, ten varieties of narcissus, and four of hyacinths were tried out this past season. The tulips did very well, and most of the narcissi made a strong showing. The climate here, however, seems too severe for the hyacinths.

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.

WHEAT

Project No. 9.—The following varieties were tried out this season with results as shown:—

Variety	Date of sowing	Date of ripening	Number of days maturing	Average length of straw	Strength of straw on a scale of ten points	Average length of head	Yield of grain per acre
				inches		inches	lb.
Marquis, Ottawa 15....	April 27	Aug. 25	120	40	10	3½	2,780
Huron, Ottawa 3.....	" 27	" 25	120	48	10	4½	2,500
Ruby, Ottawa 623.....	" 27	" 8	102	42	10	3½	2,010

OATS

Project No. 9.—The following varieties were tried out this season with results as shown:—

Variety	Date of sowing	Date of ripening	Number of days maturing	Average length of straw	Strength of straw on a scale of ten points	Average length of head	Yield of grain per acre
				inches		inches	lb.
Banner, Ottawa 49.....	April 28	Aug. 20	114	48	10	8½	2,72
Daubenay, Ottawa 47 .	" 28	" 9	104	36	10	7	2,00
Liberty, Ottawa 480...	" 28	" 25	119	36	10	7½	1,20

BARLEY

Project No. 9.—The following varieties were tried out this season with results as shown:—

Variety	Date of sowing	Date of ripening	Number of days maturing	Average length of straw	Strength of straw on a scale of ten points	Average length of head	yield of grain per acre
				inches		inches	lb.
Gold.....	May 3	Aug. 20	109	36	10	6½	3,380
Himalayan, Ottawa 59.	" 3	" 8	97	30	8	6	2,590
Manchurian, Ottawa 80	" 3	" 20	109	42	10	8	2,520
Success.....	" 3	" 6	95	38	10	3½	2,400

PEAS

Project No. 9.—The following varieties were tried out this season with results as shown:—

Variety	Date of sowing	Date of ripening	Number of days maturing	Average length of straw	Average length of pod	Yield of grain per acre
				inches	inches	lb.
Prussian Blue.....	April 27	Sept. 3	129	75	3	4,250
Arthur, Ottawa 18.....	" 27	" 3	129	68	2¼	4,060
Mackay, Ottawa 25.....	" 27	" 10	136	94	2¾	4,050
Solo.....	" 27	" 3	129	77	2¾	4,010
Chancellor, Ottawa 26.....	" 27	" 3	129	64	2¼	3,260

The land for peas was disced twice on April 13; cultivated twice April 13, and harrowed April 15; the crop was irrigated May 27, July 18 and August 3.

Peas are one of the most outstanding crops here, and more attention should be paid to this crop in the district. The Mackay pea was tried out this year for the first time, and appears to be a little late in maturing.

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

Variety	1917		1918		1919		1920		1921		Average	
	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.
WHEAT—												
Huron, Ottawa 3	27	40	12	30	39	20	44	00	41	40	33	02
Marquis, Ottawa 15	24	20	24	40	31	40	34	00	46	20	32	12
Ruby, Ottawa 623	.....		.....		29	00	30	40	33	30	31	03
OATS—												
Banner, Ottawa 49	30	40	24	38	101	00	87	02	80	00	78	15
Daubeney, Ottawa 47	24	28	17	24	67	02	70	20	58	28	47	27
Liberty, Ottawa 480	.....		28	28	22	32	35	10	35	10	30	20
BARLEY—												
Gold	45	20	30	20	68	36	50	00	70	20	53	00
Manchurian, Ottawa 50	18	00	16	20	46	32	54	08	52	24	37	26
Success	15	40	11	20	45	40	41	42	50	00	32	47
Himalayan, Ottawa 59	.....		.....		.....		.....		53	46		
PEAS—												
Prussian Blue	55	40	23	20	89	20	53	20	70	50	58	30
Solo	47	40	30	10	70	00	52	00	66	50	53	20
Arthur, Ottawa 18	44	40	30	00	67	20	52	00	67	40	52	20
Chancellor, Ottawa 26	45	00	23	40	57	20	63	20	54	20	48	44
Mackay, Ottawa 25	.....		.....		.....		.....		67	30		

"INFLUENCE OF ENVIRONMENT" PLOT

Project No. 56.—Data on the growth and development of two plots of Marquis wheat—one irrigated and one non-irrigated—are obtained throughout the season. Samples are sent to the Dominion Chemist for analysis. The Meteorological Service is co-relating the results with weather and climatic conditions, and it is hoped the results will be of great value to Canadian agriculture. The table below shows the yields of grain and straw per acre for the irrigated and non-irrigated plots for the past seven years:—

WHEAT—IRRIGATED VS. NON-IRRIGATED

Year	Irrigated		Non-irrigated	
	Yield per acre		Yield per acre	
	Grain	Straw	Grain	Straw
	lb.	lb.	lb.	lb.
1915	1,440	3,500	.....	
1916	2,080	4,000	.....	
1917	1,460	4,060	Did not	mature.
1918	1,340	3,700	Did not	mature.
1919	2,280	4,480	220	760
1920	2,040	2,560	360	920
1921	2,780	3,180	320	1,338

FORAGE CROPS

TESTING STRAINS OF WESTERN RYE AND OTHER GRASSES

Projects Nos. 25, 26 and 27.—Five strains or selections of Western rye, sent out by the Dominion Agrostologist, are being tested against commercial seed. Other grasses also are being tried out against Western rye. The seed was sown in rows on June 25, and had made good growth by the end of the season. This coming year data will be collected on the character of growth, height, weight, etc.

YIELDS OF BARLEY HAY

Project No. 57.—Success barley was sown on May 3 and cut on July 13, when the barley had nicely come into head. It yielded at the rate of 1 ton 1,528 pounds of hay per acre. A sample of this hay has been sent to the Dominion Chemist, and he reports very favourably on the analysis, stating "I should consider this an excellent forage, palatable and nutritious, and distinctly more valuable for dairy stock than many of the hays from grasses."

CUTTING BARLEY FOR HAY AND THEN PRODUCING A GRAIN CROP

Project No. 58.—This experiment was continued from last year, when a plot of Success barley was cut for hay, irrigated and forced into fresh growth and produced a grain crop. This season, due to cutting the barley hay too close to the ground, practically no second growth came on, and very little grain was harvested.

SUNFLOWERS

Project No. 18.—Sunflowers were sown on both irrigated and dry land on May 6, and harvested respectively on September 7 and 9. The following shows the yields per acre:—

Variety	Height	Heads	Weight per 100-ft. row	Yield per acre	
	inches	No.	lb.	ton	lb.
IRRIGATED—					
Early Ottawa 76	84-96	75	284	24	1,484
DRY LAND—					
Early Ottawa 76	36	Nil.	57	4	1,930

The sunflowers on the irrigated land produced an excellent crop. Part of the rows were reseeded on May 21, as cutworms had destroyed quite a number of plants. The crop was cultivated and thinned as required, and irrigated twice during the season. The yields compare very favourably with corn, which crop has yielded heavily this season.

ALFALFA AND CLOVER WITH GRASS MIXTURES

Project No. 27.—An experiment was commenced in 1917, and is now being duplicated, to compare the results of various mixtures of grasses and clover with corresponding mixtures of alfalfa and grasses. The plots seeded down this year

have made excellent growth, and are very even and uniform. The following shows the three years' average of the original test:—

	Alfalfa and Grass Mixtures			Clover and Grass Mixtures			
Plot No.	Mixture	Weight of seed sown per acre	Average yield for 3 years	Plot No.	Mixture	Weight of seed sown per acre	Average yield for 3 years
		lb.	ton			lb.	ton
1	Alfalfa	10		1	Clover	10	
	Timothy	8	5·34		Timothy	8	4·76
2	Alfalfa	10		2	Clover	10	
	Western Rye	10	5·13		Western Rye	10	5·43
3	Alfalfa	10		3	Clover	10	
	Meadow Fescue	15	5·33		Meadow Fescue	15	5·58
4	Alfalfa	10		4	Clover	10	
	Orchard Grass	15	5·14		Orchard Grass	15	5·4
5	Alfalfa	10		5	Clover	10	
	Tall Oat Grass	15	4·03		Tall Oat Grass	15	5·24
6	Alfalfa	10		6	Clover	10	
	Timothy	2			Timothy	2	
	Western Rye	3			Western Rye	3	
	Meadow Fescue	3½			Meadow Fescue	3½	
	Orchard Grass	3½			Orchard Grass	3½	
	Tall Oat Grass	3½	4·77		Tall Oat Grass	3½	5·36
7	Alfalfa alone	12	4·3	7	Clover alone	12	4·61

TESTING OF HUBAM (ANNUAL SWEET CLOVER)

Project No. 29.—This clover has now been grown two seasons, and while no extensive trials have been made, it possesses so many desirable features that it may possibly find a place on many farms. Being able to make such a rank growth and mature in one season speaks well for its soiling and hay possibilities. The orchardist may also find it a convenient cover crop, and, according to experimentalists in the States, it is the best of the clovers as a honey plant.

FIELD ROOTS

VARIETY TEST OF MANGELS

Project No. 22.—Ten varieties were sown on May 18 and harvested on September 24. The crop was cultivated, weeded, thinned and irrigated as required. The yields were as follows:—

MANGELS—TEST OF VARIETIES

Variety	Yield per 100 ft.	Yield per acre	Per cent stand	Yield 100 % stand	Notes
	lbs.	tons lbs.		tons lbs.	
Eclipse (Mackenzie)	642	16 1,384	80	20 1,730	Smooth.
Yellow Intermediate (Ottawa)	620	16 240	88	18 636	"
Giant Yellow Globe (Mackenzie)	474	12 648	75	16 864	"
Giant Sugar "	576	14 1,952	94	15 1,864	"
Long Red "	450	11 400	75	15 1,200	Very rooty.
Yellow Intermediate "	486	12 1,272	84	15 86	"
Monarch Sugar "	508	13 416	90	14 1,057	Smooth.
Golden Tankard "	446	11 1,192	80	14 990	"
Manitoba Giant Yellow "	456	11 1,612	83	14 448	Rooty.
Peerless "	296	7 1,392	60	12 1,653	Smooth.

Hubam, Annual Sweet Clover, showing season's growth.

Sunflowers under irrigation.

VARIETY TEST OF SUGAR BEETS

Project No. 23.—Three varieties of sugar beets were sown on May 18 and harvested on September 26. They were cultivated, thinned, weeded and irrigated as required. This is one of our most difficult seeds to germinate. The following table shows the yields:—

SUGAR BEETS—TEST OF VARIETIES

Variety	Yield per 100 ft.	Yield per acre	Per cent stand	Yield 100 % stand	Notes
	lbs.	tons lbs.		tons lbs.	
Waterloo	408	10 1,216	93	11 813	Rooty.
Chatham	362	9 824	86	10 1,888	Very rooty.
B.C. Grown	330	9 1,160	83	10 675	Rooty.

FIELD CARROTS

Project No. 20.—One variety only (Danish Champion) was grown this season. The seed was sown on May 18, and the crop harvested on September 29. The carrots were of good quality and yielded 11 tons, 568 pounds to the acre.

FIELD TURNIPS

Project No. 24.—Three varieties of field turnips were sown on May 18, and the crop harvested on September 30. The results were as shown on the accompanying table:—

Variety	Yield per 100 ft.	Yield per acre	Per cent stand	Yield per 100 % stand	Notes
	lbs.	tons lbs.		tons lbs.	
Ditmar's	1,051	27 652	100	27 652	Smooth.
Sutton's Champion	890	23 280	95	24 594	V. smooth.
Monarch	790	20 1,080	90	22 1,188	Smooth.

FIELD CORN

Project No. 17.—Seven varieties were sown on May 27 and harvested on September 30. The crop was irrigated and cultivated as required during the season, with results as follows:—

Variety	Height	Cobs	Yield per 100 ft.	Yield per acre		Average yield 3 years	
			lbs.	tons	lbs.	tons	lbs.
Compton Early	90	Nil	354	30	1,266	19	590
Longfellow	78	Nil	312	27	350	19	134
Wisconsin No. 7	78	Few	310	27	2	18	1,974
Leaming	78	Nil	309	26	1,827	18	940
Twitchell Pride	72	Many	276	24	90	–	–
White Cap Yellow Dent	84	Few	263	22	1,814	15	1,575
North Western Red Dent	66	Few	197	17	317	15	369

POULTRY

Two breeds, White Wyandottes and Barred Rocks, are kept at the Station. These two breeds have been selected from a number tested, as being the most suitable for the climate.

PEDIGREE WORK

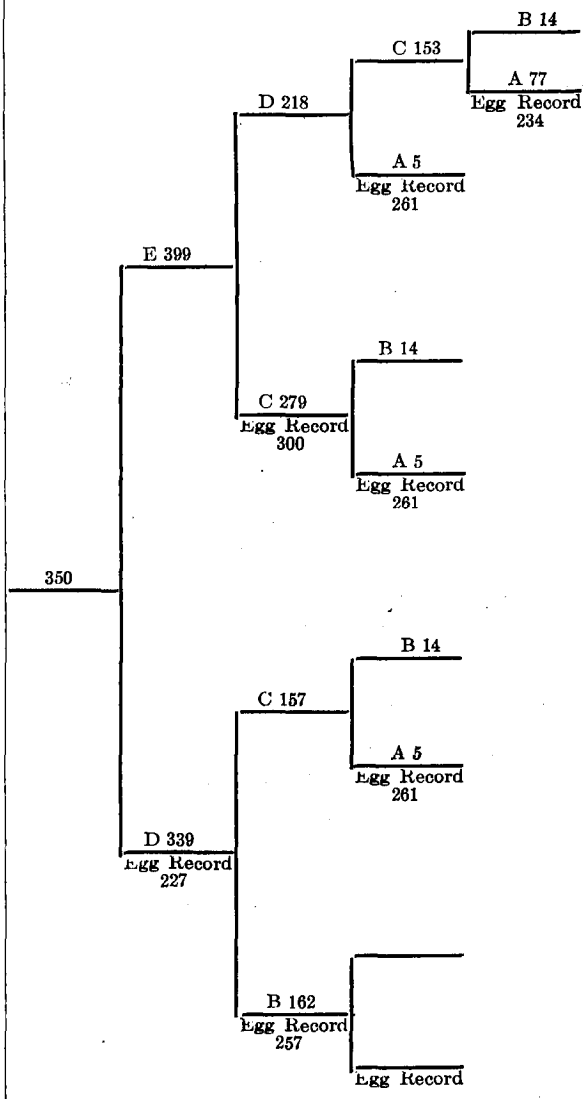
Project No. 59.—All pullets are trap-nested, and, from the best producers, breeding pens are made up for the coming year. By a system of marking the eggs, hatching each hen's eggs in a separate compartment, and leg and wing banding, each bird's identity is preserved, and a pedigree established in time.

The work this year was seriously interfered with by the unfortunate burning of a poultry house and the destruction of most of the best pullets that were hatched from the pedigree breeders last spring.

To give some idea of the work and the results, tables showing the make-up of the best breeding pens of White Wyandottes and Barred Rock are given:—

PEN NO. 1—WHITE WYANDOTTES

Hen No.	Number of eggs during year	Mated to male
D. 3	325	
D. 132	236	
D. 102	211	
D. 128	195	
E. 6	194	
D. 133	189	
D. 103	188	



PEN NO. 2—BARRED ROCKS

Hen No.	Number of eggs during year	Mated to male		
D. 76	214			
D. 77	203			
D. 57	197			
D. 6	196			
D. 42	192	E 740		252 eggs
D. 79	189			
D. 89	188			
D. 18	187		244 eggs	

BREEDING FOR EGG PRODUCTION

Project No. 60.—During the year a White Wyandotte pullet, No. E3, afterwards named "Lady Dot," produced 325 eggs from November 1, 1920, to October 31, 1921. No trap-nest record was kept prior to November 1, otherwise her yearly record would have been more. The following table illustrates her performance throughout the year:—

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total
November	1	1	1	1	1	1	1	1	1	..	1	1	1	1	1	1	1	1	1	1	..	1	1	..	1	1	1	1	1	1	..	27
December	1	1	1	1	1	1	1	1	1	1	1	1	..	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	..	..	27
January	1	..	..	..	1	..	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	27
February	1	1	1	1	1	1	1	1	1	1	1	1	..	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	..	..	27
March	1	1	1	1	1	1	1	1	1	..	1	1	1	1	1	1	..	1	1	1	1	1	1	1	1	1	1	1	1	1	1	29
April	..	1	1	..	1	1	..	1	1	1	1	1	..	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	..	1	1	25
May	1	1	1	..	1	1	1	1	1	1	1	..	1	..	1	..	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	27
June	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	..	1	1	1	1	1	1	1	1	..	29
July	1	1	1	1	..	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	..	29
August	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	31
September	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	..	30
October	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	17
Total	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	325

*Moulting.
Body weight 4 lbs. Egg colour, tinted. Egg shape 6¾" x 5¼". Egg weight, 25 ozs. to the doz.

"Lady Dot" is being mated this season with a male whose dams on the sire line for the past three generations have records from 234 to 300 eggs per year; and on the dam's side of records of 227 to 261 eggs per year. Demands for eggs, cockerels and stock from "Lady Dot" have reached us from places all the way from the Atlantic to the Pacific.

RETURNS OVER COST OF FEED

Project No. 43.—The table immediately following shows in detail the returns over the cost of feed for a pen of White Wyandottes. Some of these birds were late hatched and did not commence to lay until January and February. The returns,

however, are quite satisfactory. Similar work was carried on with Barred Rocks, but on account of being late hatched they did not make as favourable a showing as the Wyandottes, the profit per bird being $1.65.

EGG AND FEED RECORD AND PROFIT AND LOSS ACCOUNT ON WHITE WYANDOTTE PULLETS.

Particulars	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.
No. of Pullets in pen	26	25	33	38	34	33	33	31	31	31	29	25	Avg. No. 30·75
Total No. of eggs laid	177	252	446	390	461	514	368	264	199	377	243	101	3,792
Average eggs per bird	6·8	10·1	3·5	10·2	13·5	15·5	11·1	8·5	6·4	12·1	8·3	4·0	123·3
Average price of eggs per doz.	80¢	80¢	75¢	70¢	50¢	45¢	40¢	35¢	40¢	40¢	50¢	52½¢	54·75¢
Total value of eggs	$11 80	$16 80	$27 87	$22 75	$19 20	$19 27	$12 26	$ 7 70	$ 6 63	$12 56	$10 12	$ 4 42	$ 173
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Weight of feed	173	231	287	232	230	203	273	182	168	218	216	142	2,555
Weight of feed per bird	6·6	9·2	8·7	6·1	6·7	6·1	8·2	5·8	5·4	7·0	7·4	5·6	83
Weight of feed per doz. eggs	11·7	11·0	7·7	9·6	5·9	4·7	8·9	8·2	10·1	6·9	10·6	16·8	8
Total cost of feed	$ 6 57	$ 8 47	$ 8 64	$ 6 67	$7 28	$ 5 78	$ 6 71	$ 4 90	$ 4 63	$ 5 54	$ 6 61	$ 3 82	$75 62
Cost of feed per bird	25·2¢	33·8¢	26·1¢	17·5¢	21·4¢	17·5¢	20·3¢	15·8¢	14·9¢	17·8¢	22·7¢	15·2	¢$2 45
Cost of feed per doz. eggs	44·5¢	40·3¢	23·2¢	20·5¢	18·9¢	13·4¢	21·8¢	22·2¢	27·9¢	17·6¢	32·6¢	45·3¢	23·9¢
Profit per pen	$ 5 23	$ 8 33	$19 23	$16 08	$11 92	$13 49	$ 5 55	$ 2 80	$ 2 00	$ 7 02	$ 3 51	·60¢	$97 38
Profit per bird	20·1¢	33·3¢	58·2¢	42·3¢	35·0¢	40·8¢	16·8¢	9·0¢	6·4¢	22·6¢	12·1¢	2·4	$ 3 16

HATCHING

Project No. 42.—Early hatching is essential if the birds are to mature and be ready for business by November 1. On account of our long winter, difficulty in obtaining eggs with sufficient vitality to hatch is experienced. While over 70 per cent of the eggs proved fertile in March, only 15 per cent of these hatched. In April about 30 per cent of the fertile eggs hatched. While these results are poor, they are fairly representative of the conditions which prevail throughout the district. The Wyandotte eggs were more fertile and hatched a larger percentage of chicks than did the Barred Rocks.

TESTING OUT VARIOUS INCUBATORS

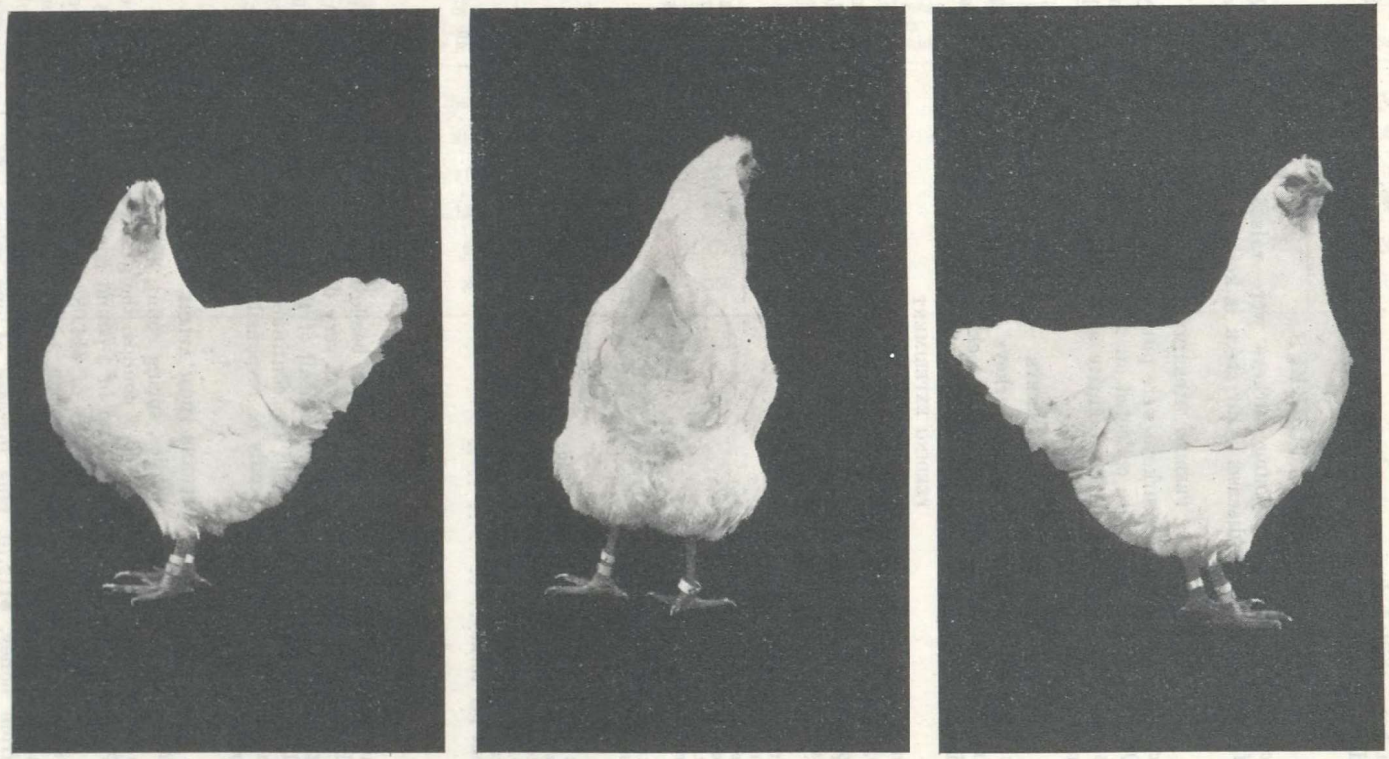
Project No. 41.—Three incubators were tried out last season, namely, Buckeye, Prairie State and Cyphers. While our hatching results on the whole were poor, on account of the low vitality in the germ, the machines stand in the order named. This is similar to last season's results, when the Buckeye was first installed.

BROODING

Project No. 61.—This season coal-burning and oil-burning brooders were tried out. The former proved the more satisfactory. Two sizes of coal-burning brooders were used, 700 to 1,000 chick size and 300 to 500 chick size. There is very little to choose in regard to care and manipulation of these machines. The smaller size, however, is preferable, as it meets better the general farm requirements, and secondly there was less mortality amongst the chicks from crowding than in the larger brooder.

DAY-OLD CHICKS

Project No. 62.—One hundred day-old chicks were sent from the Vancouver Island Station on March 23, and reached here on the evening of March 25. On arrival one chick was found to be dead, and most of the others were in a very weak condition. The chicks all died within two weeks. The mortality was probably caused



"Lady Dot," D. 3. Egg record, 325 eggs from November 1, 1920, to October 31, 1921.

by the birds being placed too near the steam pipes and overheated; or they may possibly have been chilled during the journey as other chicks hatched on the Station and raised in the same brooder suffered comparatively little loss.

TURKEYS

Project No. 47.—Eighteen young turkeys were raised last season. No loss occurred from black head or disease. Our stock is kept in the open throughout the year, and is quite healthy.

FEEDING EXPERIMENT

Project No. 47.—Seventeen turkeys were put on a fattening ration from November 1 to December 19. Data were collected on the weights of the birds at start and finish of the experiment, also on the quantity and cost of the feed. The following table summarizes the results of the test:—

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	Pounds
Initial weight of 17 turkeys	148¼
Final weight of 17 turkeys	205¼
Average initial weight per bird	8.72
Average final weight per bird	12.07
Total gain for period	57
Average gain for period	3.35

Total cost of feed at current prices	$12 36
Cost per pound gain	0 21.7

STATEMENT

148¼ pounds turkey valued at 24c	$35 58
Cost of food	12 36
Total cost	47 94
205¼ pounds turkey, sold at 35c	71 84
Total profit	23 90
Profit per turkey	1 40

BEES

The past season has been a poor one for the bee-keepers, not only in the Kootenays, but throughout the province. The season was very dry up to the middle of August, there being only about half the average rainfall of the past seven years. The autumn was not all that could be desired, and the continued cold weather during December, January and February will undoubtedly be responsible for severe winter killing. The following projects are under way:

RETURNS FROM APIARY

Project No. 4.—From eight colonies, spring count, 322 pounds of extracted honey were taken, an average per colony of 40·3 pounds, the greatest yield from one colony being 79½ pounds. The honey was put up in 5-pound containers, selling at 35 cents per pound, netting $112.70, or an average of $14.08 per colony. In September 200 pounds of sugar was fed, at a cost of $26.50, while the apiary increased from the previous fall by one colony, valued at $7. Thus the net return from the apiary—(proceeds from honey, $112.70, plus increase of one colony, $7, less sugar fed, $26.50)—is $93.20, or an average of $11.65 per colony. The following table summarizes the returns for the past five years:—

APIARY RETURNS, 1917–1921.

Year	No. of Colonies, Spring count.	Total Honey produced.	Weight of Honey per hive.	Greatest yield from one colony.	Selling-price per pound.	Total value of Honey.	Value of increase in colonies.	Value of decrease in colonies.	Value of sugar fed.	Net production value.	
										Per apiary.	Per colony.
		lbs.	lbs.	lbs.	c.	$ c.	$	$	$ cts.	$ cts.	$ cts.
1917	12	908	81·25	120	17	192·00	10	–	38·25	163·57	13·63
1918	10	1189	118·9	192	28	332·92	–	20	22·00	290·92	29·09
1919	7	885	126·4	234	33	292·05	7	–	23·40	276·65	39·38
1920	9	810	90·	199	47	380·70	–	7	46·00	326·70	36·41
1921	8	322	40·3	79·5	35	112·70	7	–	26·50	93·20	11·65

WINTERING PROTECTION OF BEES

Project No. 8.—Ten colonies of bees were wintered, 1920-21, in the Kootenay hive case. Eight colonies came through in strong condition; one colony died through lack of stores and another colony was weak and was united. The following methods of wintering bees have been tried out in previous years, namely: in a cellar; in a trench; in a double packing case; in an Ontario wintering case. The Kootenay hive case is the most suitable, and has given the best results.

FALL FEEDING

Project No. 7.—The Miller feeder has been used exclusively, and has given good results. This past season 200 pounds of sugar was fed to the bees during September, or an average of 18·18 pounds of sugar per colony. Syrup is made in the proportion of two of sugar to one of water. The table shows the amount and cost of sugar fed for the past five years:—

AMOUNT AND COST OF SUGAR FED—1917-1921

Year	No. 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.	$ ¢	$ ¢
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
1921	11	200	18·18	26 50	2 41

SWARM CONTROL

Project No. 6.—The method adopted at the Station, and which has proved very successful, is to inspect the hives systematically every week or ten days, and remove queen cells. If bees are at all crowded another super is given. A queen of select parentage, mated at Duck Island, Ont., was tested out this season, but on account of being so prolific it was difficult to keep her from swarming tendencies. Numerous nuclei were started, and most of the colonies were re-queened from this queen.

FARM IMPROVEMENTS

No new buildings were erected during the past season, but the Superintendent's and Foreman's houses were re-painted. The fences require considerable repairs, as many of the original posts have rotted off.

The roadways and barnyard were dressed with shale during the fall and winter.

EXHIBITIONS

The Station exhibit was shown at four places in the circuit, which extends from Northeast Kootenay to West Kootenay as far as the Arrow lakes. The fairs visited were those at Athalmer, Nelson, Nakusp and Creston. Owing to the dates of other fairs clashing this year, it was not possible to visit more. An average attendance of 900 per day at the fairs visited is an indication of the number of people who were interested by the exhibit.

MEETINGS, ETC.

The superintendent attended the following meetings during the year:—
British Columbia Dairymen's Convention, Chilliwack.
British Columbia Seed Fair, Chilliwack.
British Columbia Fairs Association, Chilliwack.
District Farmers' Institute Convention, Cranbrook.

Many local meetings of the Farmers' Institute, Stock Breeders' Association, Agricultural Association and Potato Growers. The fall fairs visited were Nelson, Creston and Athalmer.

The Station is attracting an increasing number of visitors from year to year. On the completion of the Banff-Windermere road this year many motorists from the prairie provinces will be going through the district.