DOMINION OF CANADA

DEPARTMENT OF AGRICULTURE

DOMINION EXPERIMENTAL FARMS

EXPERIMENTAL FARM
AGASSIZ, B.C.

REPORT OF THE SUPERINTENDENT

W. H. HICKS, B.S.A.

FOR THE YEAR 1923

AGASSIZ SEGIS MAY ECHO 41302—FORMER WORLD'S RECORD BUTTER PRODUCER
Production in 365 days: Milk 30,886 pounds, butter 1,681.25 pounds. Sire, May Echo Champion 15443.
Dam, Lady Lyons Faforit 29570

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OTTAWA
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PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1924

TABLE OF CONTENTS

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DOMINION EXPERIMENTAL FARM, AGASSIZ, B.C.

REPORT OF THE SUPERINTENDENT, W. H. HICKS, B.S.A-

SEASONAL NOTES

The spring of 1923 at first appeared backward, but April was such a fine month that in it practically all grain seeding was completed and thirty per cent of the roots as well. The clover had suffered little from winter killing and at the close of the month showed excellent growth. This growth continued up to haying time in early July, and a record crop of excellent hay was harvested. Cattle were turned to pasture earlier than usual and so a difficult feed situation was relieved. In most instances the pastures were good up to August when they suffered from lack of rain. Roots, although sown early, had difficulty in keeping pace with the weeds to the middle of June and then afterward also suffered from drought. They yielded less than average. Corn did not do well early in the year but made rapid growth during the hot dry months and although lighter than usual the crop was fair. The grain crop yielded fairly well, the quality being excellent owing to the absence of damaging rains previous to threshing.

METEOROLOGICAL RECORDS AT AGASSIZ, B.C., 1923

Month	Temperature F.			Precipitation			Sunshine
	Mean	Highest	Lowest	Rain	Snow	Total	
	°F.	°F.	°F.	Inches	Inches	Inches	Hours
January	36·33	51	12	10·55	18·5	12·40	42·1
February	32·31	50	3	1·7	21·0	3·80	75·1
March	42·82	75	28	3·37	2·0	3·57	111·7
April	52·05	76	35	2·76	.....	2·76	134·0
May	53·32	77	32	7·48	2·0	7·68	117·5
June	62·21	90	43	2·89	.....	2·89	151·6
July	66·28	89	49	1·87	.....	1·87	235·6
August	65·91	96	46	0·29	.....	0·29	245·8
September	60·80	90	38	4·68	.....	4·68	170·5
October	54·5	83	35	3·63	.....	3·63	129·6
November	45·36	60	29	7·42	.....	7·42	83·5
December	36·83	54	7	11·74	8·0	12·54	24·7
Totals	.....	.....	.....	58·38	51·5	63·53	1521·7

ANIMAL HUSBANDRY

DAIRY CATTLE

On December 31, 1923, the dairy herd numbered seventy-four head of pure-bred Holstein-Friesian cattle as follows: two mature bulls, one yearling bull, one bull calf, thirty mature cows, four three-years-old, eight two-years-old, fourteen yearlings and fourteen heifer calves.

The herd has passed another year under accreditation, having successfully filled all requirements.

HERD SIRES

Three breeding bulls are being used on the herd at the present time i.e., Maplecrest DeKol Henry—40632, Sir Canary Pietje—22654, and Agassiz Champion Re-Echo—54809.

Maplecrest DeKol Henry is an American-bred bull purchased as a calf in 1919. He lacks somewhat in scale but is straight and carries a good middle. His offspring have done well in the show ring and the first one to complete her R.O.P. made over 16,000 pounds as a junior two-year-old.

Sire—Friend Hengerveld DeKol Butter Boy—29303—A.H.B. Fifty-five A.R.O. daughters, 69 sons with tested daughters.

	Age	Milk	Butter
Banostine Belle DeKol	5 years	27,404·4	1,322·9
High-lawn Hartog DeKol	5 "	25,592·5	1,247·9
Daisy Grace DeKol	4 "	21,718·3	1,203·5
Spotted Ann Daughter	5 "	23,582·3	1,088·7
Maplecrest High-lawn Burton	4 "	19,650·3	1,034·8

Dam—Maplecrest Pontiac Nina—179872—A.H.B. Untested but is full sister to Maplecrest Pontiac Girl—143952—A.H.B. as a four-year-old produced 22,730 pounds of milk and 1,109.4 pounds of butter. Their sire, Pontiac Aaggie Korndyke—38291—A.H.B. has 33 sons with tested daughters and has 70 A.R.O. daughters, four of them over 1,200 pounds of butter in a year.

Sir Canary Pietje—22654—Bred by J. M. Steves, eight tested daughters and two sons.

	Age	Milk	Butter
S. C. P. Nora Carroll	3 years	17,469	863·75
Daisy Canary Wayne	4 "	16,499	716·25
S. C. P. Thelma Canary	2 "	15,518	713·75

Sire—Sir Canary Mechthilde—5318. Thirty-three tested daughters, 9 sons.

	Age	Milk	Butter
Thelma Canary	Mature	21,343	983·75
Canary Queen DeKol	"	19,867	921·25
Ena Netherland DeKol 2nd	"	19,986	901·25
Lillith Pauline Calamity Jane 3rd	3 years	19,802	898·75
Colony Sadie Canary	Mature	19,521	858·75
S. C. M. Leonora Hengerveld	2 years	16,348	835·0
Leonora Mechthilde	Mature	16,210	830·0

Six others above 700 pounds of butter.

Dam—Lady Pietje Canary's Jewel—17314. Under official test for the whole year as a junior three-year-old she made the largest butter record of any cow, of any breed, in Canada at that time.

Year's milk record	24,149·3	pounds
Year's butter record	1,173·6	"
7 days milk record	671·9	"
7 days butter record	32·81	"
1 days milk record	100·6	"

Sir Canary Pietje is a big bull weighing over 2,300 pounds; is a fairly good show bull and is mating well with the daughters of Maplecrest DeKol Henry.

Agassiz Champion Re-Echo—54809. This is a yearling bull bred on the farm. As he is inbred and related to a number of the females he can only be used to a limited extent.

Sire—Agassiz Sir Inka Sylvia—37726. This young bull's first R.O.P. daughter gave 16,644 pounds of milk and 715 pounds of butter as a two-year-old. On the sire's side he is half-brother to May Echo Sylvia and May Echo Champion, the latter being sire of Agassiz Segis May Echo. Agassiz Sir Inka Sylvia is from the same dam as Agassiz Segis May Echo.

Dam—Agassiz Segis May Echo—41302. The former world's record butter producer, 30,886 pounds of milk and 1,681.25 pounds of butter in one year.

DAIRY HERD RECORDS

The following list shows the performance of all cows finishing a lactation period during the year 1923. In this table feeds are charged at market value. Butterfat is computed at 50 cents per pound and skim-milk at 25 cents per one hundred pounds.

Of the twenty-seven cows finishing a milking period, seventeen, or almost sixty-three per cent gave birth to heifer calves. The average production of these cows was 12,371 pounds of milk and 432 pounds of fat for an average lactation period of 413 days. Six of these completed records were made by two-year-old heifers, number 159 making the second best two-year-old record ever completed on this farm. The most important record reported is that of No. 98, Agassiz Segis May Echo, with 30,886 pounds of milk and 1,681.25 pounds of butter. This was the greatest butter record ever made by any cow in the world up to that time.

These results show clearly some of the effects of abortion disease. The long lactation periods are caused by difficulty in getting the cows to conceive, while the increased number of animals showing a debit balance is explained by the fact that the dry period preceding the freshening was extended and then abortion taking place the production was greatly lessened. Cows number 126 and 142 are two excellent producers under healthy conditions as each gave over 16,000 pounds of milk as two-year-olds.

COWS, WHICH HAVE COMPLETED LACTATION PERIODS DURING 1923

Cow number	Number of lactation period	Number of days in milk	Total amount of milk produced	Average yield of milk per day	Average percentage of fat in milk produced	Pounds of fat for period	Pounds of butter for period	Total amount of meal consumed	Total Amount of roots and silage consumed	Total amount of hay consumed	Months on pasture at $2.00 per month	Beet pulp and molasses consumed	Total cost of feed	Total value of product	Profit on product	Cost to produce 100 pounds of milk	Cost to produce one pound butter	Sex of calf
			lbs.	lbs.		lbs.	lbs.	lbs.	lbs.	lbs.	$ cts.	lbs.	$ cts.	$ cts.	$ cts.	$ cts.	cts.	
98	3	365	30,886·0	84·62	4·35	1,345·0	1,681·50	8,656	26,118	5,530	.....	3,314	386 89	741 99	355 10	1 25	23·0	M
70	6	359	14,536·1	44·9	3·6	523·33	654·17	4,290	20,850	900	2 63	72	144 21	294 35	150 14	0 99	22·0	F
86	4	365	21,071·0	57·73	3·26	687·0	858·75	6,727	27,472	2,939	.....	1,983	282 40	390 91	108 51	1 34	32·88	F
127	3	516	15,342·4	29·73	3·27	502·80	628·50	5,843	29,255	1,150	5 82	95	201 20	285 92	84 72	1 31	32·01	F
159	1	365	16,644·0	45·6	3·44	527·00	715·0	5,728	20,410	2,182	.....	1,503	229 62	300 95	71 33	1 32	32·16	F
81	5	431	13,244·8	30·73	3·64	482·48	603·1	5,429	29,408	1,767	5 27	.....	190 92	271 04	80 12	1 44	31·65	F
93	5	314	10,190·2	32·45	3·77	384·55	480·69	3,814	19,280	1,150	6 15	95	137 60	215 20	78 60	1 35	28·62	F
77	5	490	16,325·5	33·31	3·12	509·91	637·4	5,992	32,677	1,952	5 70	211	216 08	291 68	75 60	1 32	33·9	F M }
114	3	490	13,572·6	27·69	3·57	485·88	607·35	5,878	27,270	1,480	8 95	.....	198 66	273 47	74 81	1 46	32·7	M }
56	6	415	13,091·7	31·54	3·48	456·35	570·43	5,241	25,340	1,532	5 70	95	183 48	257 63	74 15	1 40	32·16	M
147	2	416	10,789·4	25·93	3·6	391·45	489·45	4,686	20,553	1,155	5 59	.....	153 97	220 00	66 03	1 42	31·45	M
52	6	510	12,956·2	25·4	3·85	499·97	624·96	6,094	33,989	1,608	6 02	.....	213 55	279 13	65 58	1 65	34·17	M
157	1	365	13,673·0	37·46	3·69	505·0	631·25	5,902	18,105	2,488	.....	1,385	222 26	283 26	61 00	1 63	35·21	M
167	1	365	11,452·0	31·37	3·71	425·0	531·25	4,704	20,575	320	0 45	812	177 98	238 27	60 29	1 55	33·5	F
118	3	455	10,402·1	22 86	3·67	383·22	479·02	4,773	26,963	1,214	5 83	.....	168 53	215 01	46 48	1 62	35·18	F
143	3	389	11,708·0	30·09	3·09	351·87	439·83	4,903	24,322	650	1 65	165	164 53	202 28	37 75	1 40	37·4	F
164	1	267	6,016·6	22·53	3·42	206·01	257·51	2,498	12,451	1,289	0 43	86	92 49	116 54	24 05	1 53	35·91	F
149	2	241	7,099·7	29·45	3·16	224·63	280·78	3,198	16,653	598	1 00	.....	108 28	128 29	20 01	1 52	38·56	F
75	10	364	9,427·1	25·9	3·52	331·94	414·92	4,791	27,164	1,207	6 09	117	170 95	187 18	16 23	1 81	41·2	M
156	1	510	9,798·0	19·21	3·73	365·70	457·12	5,548	28,976	1,722	4 27	.....	191 50	204 90	13 40	1 95	41·88	M
46	7	481	13,557·8	28·18	2·75	373·91	467·38	6,135	31,374	1,806	5 70	.....	210 27	217 46	7 19	1 55	44·98	M
155	1	509	8,999·3	17·68	3·86	348·13	435·16	5,696	28,904	1,317	6 57	.....	190 06	194 24	4 18	2 11	43·67	F
135	2	538	10,694·3	19·87	3·44	367·03	458·78	6,250	32,464	1,514	5 70	.....	206 76	207 57	0 81	1 93	45·06	M
151	2	273	6,634·1	24·3	3·28	217·77	272·21	3,749	18,170	1,110	5 52	.....	129 28	123 81	−5 47	1 94	47·49	F
145	2	352	7,849·4	22·3	3·0	236·05	295·06	4,490	21,930	1,290	5 27	.....	153 59	135 68	−17 91	1 95	52·95	F
126	2	522	8,886·5	17·02	3·09	275·42	344·27	5,308	30,704	1,709	5 27	.....	198 37	157 70	40 67	2 23	57·62	F
142	2	478	9,163·3	19·17	2·88	264·19	330·23	5,728	28,608	2,538	2 70	112	199 29	152 71	−46 58	2 17	60·34	F

Average number of days of lactation periods	413
Total amount of milk produced	334,011.1 lbs.
Average yield of milk per cow	12,371·0 "
Average yield of milk per cow per day	30·0 "
Average percentage of fat in milk produced	3.494%
Total amount of fat produced	11,671·59 lbs.
Average yield of fat per cow	432·0 "

DRIED BEET PULP VERSUS MANGELS

Dried beet pulp is being fed more extensively to pure-bred cows on test in this province. The cost delivered is too high for commercial cattle but for record work it has a place.

A comparison for beet pulp with mangels was obtained by feeding four cows for three periods of two weeks each. The cows were fed twelve pounds per day of a grain ration composed of four parts bran, four parts oat chop, one part oilcake and one part corn meal. They were also fed fifty-one pounds of silage and five and one-quarter pounds of cut hay per day. During the mangel periods pulped mangels were fed at the rate of sixty pounds per day and charged at $5 per ton. In comparison, the beet pulp was fed at the rate of six pounds (dry weight) per day and cost $50 per ton. Molasses was fed with the beet pulp at the rate of three-quarters of a pound per cow daily, costing four and one-half cents per pound.

MANGELS VERSUS BEET PULP

		Mangels	Beet Pulp
Number of cows on trial		4	4
Total milk produced by all cows	lbs.	746·5	792·8
Amount of milk produced per cow per day	"	26·66	28·31
Percentage fat in milk produced	%	3·326	3·345
Amount fat produced per cow per day	lbs.	0·8876	0·9471
Grain consumed per 100 lbs. milk produced	"	45·057	42·381
Grain consumed per 1 lb. fat produced	"	13·5678	12·6693
Mangels consumed per 100 lbs. milk produced	"	225·2869	.....
Mangels consumed per 1 lb. fat produced	"	67·8393	.....
Beet pulp consumed per 100 lbs. milk produced	"	.....	21·19
Beet pulp consumed per 1 lb. fat produced	"	.....	6·3346
Silage consumed per 100 lbs. milk produced	"	191·4939	180·121
Silage consumed per 1 lb. fat produced	"	57·6635	53·8449
Cut hay consumed per 100 lbs. milk produced	"	19·7125	18·5418
Cut hay consumed per 1 lb. fat produced	"	5·9359	5·5428
Total cost of feed	$	15·52	16·47
Cost to produce 100 lbs. milk	c.	208·122	207·7447
Cost to produce 1 lb. fat	c.	62·6707	62·1226
Cost to produce 1 lb. butter	c.	50·1365	49·7012

The results show that the cows produced more milk and fat when fed six pounds of beet pulp per day than when fed sixty pounds of mangels. There was little difference in the cost of one hundred pounds of milk, just 0.378 cents per hundred pounds less in favour of the beet pulp. Butter cost 0.4353 cents more when the mangels were fed.

CORN SILAGE VERSUS SUNFLOWER SILAGE

This experiment was conducted during November and December. The cows were fed twelve pounds of grain per cow per day throughout the experiment, the mixture being three parts bran, three parts oat chop, two parts barley chop and one part oil meal, costing 1.61 cents per pound. They were also fed twenty pounds of pulped mangels, five pounds of clover hay and all the ensilage they would eat, which was an average of sixty pounds of sunflowers and about seven pounds more of corn per cow per day.

CORN SILAGE VERSUS SUNFLOWER SILAGE

		Corn Silage	Sunflower silage
Number of cows in experiment		9	9
Total milk produced by all cows	lbs.	2117·1	1985·7
Amount milk produced per cow per day	"	33·6	31·519
Percentage butterfat in milk produced	%	3·187	3·071
Amount fat produced per cow per day	lbs.	1·071	0·968
Grain Mixt. consumed per 100 lbs. milk produced	"	35·713	38·072
Grain Mixt. consumed per 1 lb. fat produced	"	11·209	12·396
Corn silage consumed per 100 lbs. milk produced	"	200·609	.....
Corn silage consumed per 1 lb. fat produced	"	62·847	.....
Sunflower consumed per 100 lbs. milk produced	"	.....	190·361
Sunflower consumed per 1 lb. fat produced	"	.....	61·98
Mangels consumed per 100 lbs. milk produced	"	59·523	63·453
Mangels consumed per 1 lb. fat produced	"	18·677	20·66
Clover hay consumed per 100 lbs. milk produced	"	14·88	15·863
Clover hay consumed per 1 lb. fat produced	"	4·67	5·165
Total cost of feed consumed	$	29·105	27·92
Cost to produce 100 lbs. milk	c.	137 429	140·605
Cost to produce 1 lb. fat	c.	43 102	45·78
Cost to produce 1 lb. butter	c.	34 482	36·624

The cows produced slightly over two pounds more milk per cow per day when corn ensilage was fed. They also tested slightly better. One hundred pounds of milk cost 3.196 cents less and a pound of butter 2.142 cents when corn ensilage was fed.

DAIRY

STILTON CHEESE

The work on this cheese was continued, following the same method as last year, and seems to have established the observations then made, i.e., that a curd made from the fresh milk without the addition of any starter and with the temperature regulated so as to facilitate the formation of acidity while the curd is draining, gives the best results. It is still found advisable to inoculate the curd with mould spores in order to ensure a good blue vein throughout this cheese.

CREAM CHEESE

Cream cheese was also sold throughout the year; it was not found necessary to make any alteration in the method. Through the autumn the yield of cheese per pound of cream has been larger.

CHESHIRE CHEESE

Cheshire cheese has again been made at intervals during the year and found a ready market. This cheese could, if desired, be made at any time of the year as, unlike Stilton, the rind does not crack in dry or windy weather.

MEILLEUR CHEESE

Some experiments have been made (at intervals from April to December) with the Meilleur cheese, which has been introduced by the Central Experimental Farm at Ottawa. This product has not been placed on the market here but the work done indicates that it will be possible to get a correct reproduction of the cheese in the conditions prevailing here. This adaptability would enhance the usefulness of the Meilleur cheese, as it is not always found practicable to transfer the manufacture of a brand of cheese from one set of conditions to another while keeping it true to type.

CHEESE PRODUCTION AND PRICES

Prices have been maintained at the level of previous years, while prices for other lines of dairy produce have dropped considerably. From the commercial point of view the manufacture of cheese here has been profitable.

Quantities of cheese made during the year:—

Kind	Number manufactured
Cream	1451
Stilton	37
Cheshire	25
Pont l'Eveque	18
Meilleur	18

MILK TESTING

Milk testing work consisted of the weekly composite test for each cow, the supervision of five Record of Merit tests and testing of samples sent in by farmers in the district.

HORSES

The horses on hand December 31, 1923, total twenty-two head, eighteen of them being pure-bred Clydesdales and the balance grades.

Clydesdale mares and foals. Six mares bred and six foals raised.

The health of the horses during the year was excellent. A mature grade mare and gelding were shipped to the Summerland Farm in November and one of the yearling geldings became crippled and was destroyed. From the six mares that were in foal last year six good foals were reared. They averaged in weight December 31, 1923, 815 pounds. Four mares, Madge, Heather, Diana, and Princess Melita, were bred last season and all are in foal.

Records show an average cost of just over $82 for feeding a yearling and a two-year-old stallion for a year. The average cost for a two-year-old filly and two yearling geldings was $50.51. Madge, Bell, Heather, Diana, and Nellie,

all pure-breds, on an average feed cost of $73.92 each, raised a foal and averaged 586 hours labour. Nellie and Heather foaled early, the former doing 1,240 hours' work in the year, most of it after foaling. Bell foaled late and did 960 hours' labour, most of it previous to foaling and in the winter. Scotty, a three-year-old gelding, was broken in the spring, worked all summer and then ran out the balance of the year. Pete, Melita, and Princess Melita, along with the team sent to Summerland, did most of the heavy work. The average feed cost of the three former was $122.20 for an average of 2,325 hours' work accomplished, or an average of 5·256 cents per hour.

SHEEP

The following animals were on hand at the close of the year 1923: Five Dorset rams, fifty-seven pure-bred Dorset breeding ewes, twenty-four grade Dorset ewes, ten grade Oxford ewes and sixteen lambs born in December for the purpose of supplying the Easter market.

BREEDING EWE LAMBS VERSUS BREEDING AS SHEARLINGS

Five lambs born in January, 1921, were bred late in the autumn of the same year and compared with five lambs not bred till the fall of 1922, with the results as shown below:—

BREEDING EWE LAMBS VERSUS BREEDING AS SHEARLING

Number of lamb	Ewe Lambs Bred Autumn, 1921							
	Date of birth, 1921	Weight Nov. 1, 1921	Yield of wool, 1922	Number of lambs raised 1922	Weight Nov. 1, 1922	Yield of wool 1923	Number of lambs raised 1923	Weight Nov. 1, 1923
		lbs.	lbs.		lbs.	lbs.		lbs.
337	Jan.	130	8·6	1	154	5·7	.....	186
340*	"	111	8·6	died	152	7·0	1	164
347	"	142	9·1	2	165	7·6	3	168
348	"	125	8·5	1	158	6·7	2	164
367	"	141	8·3	1	180	10·4	1	199
Average.....		129·8	8·62	1	161·8	7·48	1·4	176·2

Number of lamb	Ewe Lambs Not Bred in 1921						
	Date of birth, 1921	Weight Nov. 1, 1921	Yield of wool, 1922	Weight Nov. 1, 1922	Yield of wool, 1923	Number of lambs raised, 1923	Weight Nov. 1, 1923
	lbs.	lbs.	lbs.	lbs.	lbs.		lbs.
349	Jan.	140	10·2	190	9·3	1	213
353	"	126	11·7	177	7·4	.....	194
358	"	120	12·7	156	Sterile sold butcher		
360	"	129	7·9	182	6·9	.....	210
377	March	119	9·5	183	7·6	2	188
Average.....	.....	126·8	10·4	177·6	7·8	0·75	201·25

*Ewe No. 340, whose lamb died, raised a lamb from No. 347.

The ewes that were bred as lambs raised five lambs, three of which were sold at Easter time for $27.90. The remaining two ewe lambs averaged 112 pounds in weight November 1, 1922 and 166 pounds November 1, 1923, and yielded fifteen pounds of wool that year. The ewes not bred as lambs in 1921 averaged 1·78 pounds more wool in 1922 and weighed an average of 15·8 pounds more in November, 1922, than the group that were bred as lambs.

In 1923 the ewes, bred as lambs, averaged 0·48 pounds less wool and 25·05 pounds lighter than the other group. This comparison of weights, however, is deceiving as one group raised seven lambs as compared to three in the other and the latter ewes should naturally be in better condition. In fact two lambs from No. 347, one from 377 and the lamb from 349 died accidentally and these lambs were not being suckled by their dams the greater part of the summer. Everything considered to date, the ewes bred when ten months old have produced better returns than those not bred till they were two years, although the latter are heavier now.

WOOL YIELDS FROM DIFFERENT GROUPS OF SHEEP

The grading work with the pure-bred Dorset and Oxford rams is being continued. Below are given the 1923 wool yields of the Dorset ewes and the different crosses.

Description	Number of ewes	Average weight per fleece
		lbs.
Shearlings		
Pure-bred Dorsets	9	9·6
Dorset Third Cross	8	12·1
Oxford Second Cross	3	13·8
Mature Ewes		
Pure-bred Dorsets	37	7·7
Dorset Second Cross	12	8·5
Dorset Third Cross	4	7·9
Oxford First Cross	6	10·0
Oxford Second Cross	1	11·6

These results show the Oxford and Dorset grades as shearlings and mature ewes giving better yields of wool than pure-bred Dorsets. In all fairness to the pure-breds it must be noted that a few of the best animals were trimmed for exhibition purposes and thus their wool yields decreased; also, that among the mature pure-bred Dorsets are a number of very old ewes whose fleeces do not now compare with their former yields.

FLUSHING EWES PREVIOUS TO BREEDING

Several groups of mature ewes and shearlings were selected during 1922 for the purpose of getting data on the effect of generous feeding at breeding time to the succeeding lamb crop. Many of these ewes had raised early lambs for the 1922 Easter market, some were dried off early, while other suckled their lambs till the end of July, were then dried off and bred in August. The data secured showed little value in feeding grain previous to breeding, but the lambing results were so unusual from other causes that further work of the kind must be done before conclusions can be formed.

CO-OPERATIVE WOOL SELLING

The 1923 wool clip was 93 fleeces, 773 pounds, or an average of 8.31 pounds per fleece. It was sold through the Canadian Wool Growers.

WOOL CROP

Grade	Pounds	Value	Amount
	lbs.	cts.	$ cts.
Medium Staple (3-8 Blood Staple), Semi-bright	63	32	20 16
Low Medium Staple (¼ Blood Staple), Semi-bright	441	23	101 43
Low Medium Staple (¼ Blood Staple), Bright	202	26	52 52
Low Staple (Low ¼ Blood Staple), Semi-Bright	67	19	12 73
Total	773		186 84

Of this amount it cost $48.20 for selling, grading, freight and sacks, leaving $138.64 net for 773 pounds of wool, or almost 18 cents per pound or $1.49 per sheep.

VALUE OF SILAGE FOR PREGNANT EWES

It has been the practice at this Farm of late years to breed a number of ewes very early with a view to having some lambs ready for the Easter market, the balance of the ewes usually lambed during March or April. An excellent pasture season was brought to conclusion on December 5 and this date marked the commencement of stable feeding, the entire flock going on a ration consisting of 1¼ pounds of corn silage, ¾ pound of sunflower silage, ¾ pound of cut hay mixed with the silage, and ¼ pound of grain per ewe daily, besides being allowed to pick at racks containing a poor quality of hay. The lambing results were the poorest on record here.

The group of forty-nine ewes bred for early lambs were due between January 3 and February 7. On January 3, although only one ewe was due by that date, eleven ewes had lambed, the first one on December 28, six on January 1, three on the 2nd and one on January 3. These eleven ewes gave birth to twenty-three lambs, three of which were dead at birth, eleven died shortly afterward and only nine were raised. On the following day another ewe due January 9 lambed a pair that were raised. On this date a change was made in the feeding. Choice clover was placed before the ewes at all times; no more silage was fed to the early lambing group, and cut hay was mixed with pulped mangels sufficient for two to three pounds per ewe per day. Up to January 10 no improvement was made as ten more ewes had lambed, all except two from one to ten days ahead of time, and only eight lambs raised out of nineteen born. From then on, however, great improvement was noticeable and up to February 6, when the last of the early group lambed, twenty-seven ewes gave birth to forty lambs and raised thirty-one of them besides two others which died accidentally. Eight of these twenty-seven ewes went full time and many of them lambed only one or two days prematurely. Up to January 10 (six days after changing feed) only 43.2 per cent of the lambs born were raised, while afterward 82.5 per cent were raised.

LATE LAMBING GROUP

When such results were secured in the previous group, it was deemed advisable to carry on further investigations with the later-lambing ewes and accordingly this flock was divided into two lots on January 31, one lot continuing on the same feed and the other receiving pulped mangels instead of silage. This group of ewes was fed silage right through until the end of January, the sunflower silage being discontinued, additional corn silage substituted and good clover hay was placed in the racks. It was found that 55 per

cent of the ewes on continued feeding of silage gave birth to premature lambs and raised 83.3 per cent of them. More of this group might have lambed prematurely had they not been able to get a nibble of fresh grass in the lanes. This is particularly true of the last four to lamb. Fifty per cent of the ewes fed mangels lambed prematurely and raised 80 per cent of their lambs.

It would seem from these results that more experimental work must be done before silage can be accepted as a safe feed for breeding ewes. A small amount of silage at intervals probably would do no harm, but as a continued feed care should be exercised.

EASTER LAMB PRODUCTION

From the group of ewes that lambed between January 3 and February 7, twenty-two lambs were selected for the Easter market. These lambs weighing 1,245 pounds, an average of 56.6 pounds, sold for $211.65, bringing over $9.60 per lamb. This is about the same price that spring lambs were sold for in the fall, although these were much heavier than the Easter lambs.

SWINE

There were seventy-three pure-bred Yorkshire swine on this Farm on December 31, 1923. They consisted of the following: Two mature boars, one yearling imported boar, one boar ten months old, eleven brood sows, ten sucking pigs and forty-eight experimental feeders. The two old boars Pine Grove Jock 2nd —49402—, and Springdale Makepeace —58720—, are in excellent health although getting aged. The former is nearly nine years old and has been doing active service on this Farm for the past six years. The latter was six years old last July and has been here for four years. These two boars are excellent breeders as well as individuals and have assisted in no small way in improving the swine stock of this province. The sows are daughters of one or other of the old boars and are a nice lot.

The young boar selected to succeed the old boars is an imported hog Rogerfield Masterpiece —88842—, bred by McNaughton Bros., of Scotland, sired by Spalding Wonder 6 (24521) and from Dalmeny Mina (58850), a sow bred by the Earl of Rosebery.

The demand for young breeding stock was not as great as usual although many enquiries were directed elsewhere. Fourteen young pigs, seven of each sex, were sold during the year for breeding purposes.

MINERAL MIXTURES, POTATOES, AND SELF-FEEDERS

Early in the year an experiment in hog feeding was commenced with seven pens of six pigs each with the following objects in view:—

First.—To secure data on the value of feeding mineral matter to feeder pigs.

Second.—To determine the value of self-feeders for winter use in small pens for feeder pigs.

Third.—To compare boiled potatoes fed alone with grain fed alone, and with a combination of half grain and half potatoes.

The meal mixture fed consisted of: shorts, 400 pounds; corn meal, 100 pounds; chopped oats, 100 pounds; chopped barley, 100 pounds. This ration cost 1·593 cents per pound.

The mineral mixture was fed at the rate of three per cent of the grain ration and cost 2·7 cents per pound. It was made up of the following: ground bone meal, 8 pounds; ground charcoal, 5 pounds; ground rock phosphate, 5 pounds; salt, 3 pounds.

PIG FEEDING EXPERIMENT—MINERALS, POTATOES AND SELF-FEEDERS

		Lot 1 Grain with mineral in self-feeder	Lot 2 Grain without mineral in self-feeder	Lot 3 Grain with mineral fed wet in trough	Lot 4 Grain without mineral fed wet in trough	Lot 5 No grain potatoes with mineral fed in trough	Lot 6 No grain potatoes without mineral fed in trough	Lot 7 Half grain with mineral and half potatoes fed in trough
Number of pigs in experiment		6	6	6	6	6	6	6
Total weight of pigs Jan. 13	lbs.	540·0	540·0	532·0	545·0	540·0	535·0	530·0
Total weight of pigs Mar. 3	lbs.	816·0	638·0	915·0	787·0	866·0	820·0	992·0
Total gain in weight in 50 days	lbs.	276·0	98·0	383·0	242·0	326·0	285·0	462·0
Average gain per pig per day	lbs.	0·92	0·3266	1·276	0·8066	1·086	0·95	1·54
Value of total gain at 9 cents per pound	$	24·84	8·82	34·47	21·78	29·34	25·65	41·58
Feed consumed								
Pounds of milk at 25 cts. per 100 pounds	lbs.	920·0	920·0	920·0	920·0	920·0	920·0	920·0
Pounds mineral mixture at 2.7 cents per pound	"	41·0	.....	41·0	.....	41·0	.....	38·0
Pounds meal mixture at 1·593 cts. per pound	"	1,328·0	873·0	1,313·0	1,079·0	.....	.....	1,220·0
Pounds potatoes at $12.00 per ton	"	.....	.....	.....	.....	4,316·0	4,162·0	1,258·0
Total cost of feed consumed	$	24·56	16·20	24·33	19·49	29·31	27·27	30·31
Total profit or loss over cost of feed	$	0·28	−7·38	10·14	2·29	0·03	−1.62	11·27

The results secured show that in every instance where mineral was fed, greater and cheaper gains were made than where no mineral was given, other feeds being similar. Compare lots 1 with 2, 3 with 4, and 5 with 6. In this trial the self-feeder gave less satisfactory results from the standpoint of total gains or economical gains when compared with ordinary trough feeding. Compare lot 1 with 3 and 2 with 4. The pigs receiving for half their feed grain with three per cent mineral and the other half boiled potatoes, all fed in a trough, made the greatest gains and greatest profit, as compared to pigs fed potatoes alone or to those fed grain alone. Compare lot 7 with 3 and 5. Those fed grain alone gave better returns than those fed potatoes alone. Compare lot 3 with 5 and 4 with 6.

It is interesting to note the effect of these different feeds on stiffness or rheumatism. No stiffness was present in any of the pens where potatoes were fed. The pigs in lot 3, fed grain with mineral in a trough, were also in good condition while some of those in lot 4, without mineral, were affected. The two self-feeder lots suffered greatly from rheumatism, lot 2, receiving no mineral being worse than the other group.

PASTURE AND PADDOCK FEEDING VERSUS PADDOCK FEEDING

On June 8 thirty-six fine young Yorkshire pigs averaging in weight 65 pounds were divided into two uniform lots, each weighing 1,170 pounds. One group was placed in the piggery and given the run of a small bare paddock and fed as much as they would eat, the object being to market them as quickly as possible. The other group was put on a clover and grass pasture 1·75 acres in extent, with excellent shade, and fed one pound of grain per pig per day. By August first the pasture was getting bare so on that date they were placed in the piggery and fed heavily till sold on September first. The grain ration fed to each group was three parts shorts and one part barley. Up to August 9.

the date the paddock lot was sold, all available skim milk was divided evenly between each group, but afterward the pasture group received more.

PADDOCK OR PASTURE FOR PIGS

		Paddock Lot 1	Pasture and Paddock Lot 2
Number of pigs in each group		18	18
Total weight June 8	lbs.	1,170·0	1,170·0
Average weight June 8	"	65·0	65·0
Total weight Aug. 1	"	.....	1,800·0
Average weight Aug. 1	"	.....	100·0
Average gain per pig per day on pasture for 54 days	"	.....	0·648
Total weight Aug. 9	"	2,458·0	.....
Average weight Aug. 9	"	136·6	.....
Average gain per pig per day in paddock for 62 days	"	1·154	.....
Total weight September 1	"	.....	3,123·0
Average weight September 1	"	.....	173·5
Average gain per pig per day since Aug. 1, 31 days	"	.....	2·371
Total gain both periods, 85 days	"	.....	1,953·0
Average gain per pig per day both periods, 85 days	"	.....	1·276
Total feed consumed			
Shorts 3657 pounds at $22 per ton	$	40·23	.....
Shorts 3351 pounds at $22 per ton	$	.....	36·86
Barley chop 1219 pounds at $34 per ton	$	20·72	.....
Barley chop 1117 pounds at $34 per ton	$	.....	18·99
Skim milk 3445 pounds at 25 cts. per 100	$	8·61	.....
Skim milk 8065 pounds at 25 cts. per 100	$	.....	20·16
Rent of pasture, 1·75 acre at $10 per acre	$	.....	17·50
Total cost of feed	$	69·56	93·51
Feed cost to produce 1 pound of gain	cts.	5·4	4·788

On this occasion greater returns were received from the feed when the pigs were put on pasture and later stall fed, than where they were forced in a paddock right from the start. This is true even after an allowance of ten dollars per acre rental is made for the pasture. The pigs on pasture with only one pound of grain per pig per day did not make rapid gains but they grew quickly and then when put in pens finished rapidly. Although the pigs at the commencement were very uniform in weight and type, when sold, those in lot one were shorter and thicker than the other group. The close confinement had a tendency to keep the pigs short and thick while the exercise on the pasture tended to lengthen the hogs out. The lot sold on August 9 brought only 8½ cents per pound while those sold on September first returned 9½ cents. This difference was due to market quotations and not to the quality of the hogs, as the local market does not discriminate against, but rather prefers, a shop hog of around one hundred and forty pounds.

FIELD HUSBANDRY

ROTATION WORK

The four-year rotation work was carried on in a manner similar to that of previous years. It consists of: first year, hoed crop; second year, grain seeded down; third year, hay; fourth year, pasture.

Hoed Crops

The crops grown in this section were roots, potatoes, sunflowers and corn. The land was given a twelve-ton-per-acre application of barnyard manure

during the autumn and winter, on the sod. That portion set aside for the root crop was ploughed in the fall, reploughed in the early spring and well worked. The varieties of mangels grown were White Sugar and Danish Sludstrup. The seed was sown at the rate of ten pounds per acre on drills set up with a double mould board plough, thirty inches apart. At the same time commercial fertilizers, composed of 100 pounds of nitrate of soda, 100 pounds muriate of potash and 400 pounds superphosphate of lime per acre, were applied. The roots were thinned early and kept well weeded, but exceedingly dry weather from July to harvesting time was the direct cause of a lighter crop than usual.

Grain

The grain was grown on land that had been in hoed crop the previous year, and had been ploughed in the fall after the hoed crop was harvested. The field was well worked in the spring, sown the middle of April, and harvested the first part of August. The same grass and clover mixture was used for seeding down as in previous years, viz., 9½ pounds red clover, 3½ pounds alsike clover, 1½ pounds white dutch clover, 2 pounds Italian rye grass, 2 pounds orchard grass per acre.

Pasture

The pasture season on the whole was one of the best on record. The cattle were put on pasture the middle of April, and except for a time during the dry period, the pasture was good to November 15.

COST OF PRODUCTION

Below are given the cost prices and return values used in determining the cost of producing the various crops of the four-year rotation which is being carried on at this station.

COST PRICES

Rent (including taxes)	$24 00 per acre
Manure (cost of handling only)	1 00 per acre

The cost of the manure is distributed as follows: 40 per cent to the first crop of the rotation, 30 per cent to the second, 20 per cent to the third and 10 per cent to the fourth.

Manual labour	$0 27½ per hour
Teamster labour	0 30 per hour
Horse labour	0 19 per hour
Machinery	3 00 per acre
Twine	0 20 per pound
Threshing	0 04½ per bushel
Oats	1 19 per bushel
Corn	2 25 per bushel
Mangel seed	0 55 per pound
Red clover	0 28 per pound
Alsike	0 21 per pound
Italian rye grass	0 14 per pound
White Dutch clover	0 65 per pound
Orchard grass	0 24½ per pound

RETURN VALUES

Oats	$ 0 42½ per bushel
Hay	20 25 per ton
Oat straw	8 10 per ton
Corn	6 75 per ton
Roots	3 37½ per ton

YIELDS OF CORN AND SUNFLOWERS FOR ENSILAGE PURPOSES

Giant Russian sunflowers sown in drills on a 4·5 acre field yielded 10 tons 1600 pounds per acre as compared to Longfellow corn grown under similar conditions and yielding 8 tons 1480 pounds per acre.

CORN IN DRILLS VERSUS IN HILLS

Corn sown in drills yielded at the rate of 8 tons 1480 pounds per acre, as compared to a yield of 7 tons 1810 pounds sown in hills.

VALUE OF COMMERCIAL FERTILIZER FOR MANGELS

Nine plots of mangels were grown under field conditions to determine the value of the different mixtures. The superphosphate cost $33, the nitrate $75 and the potash $68 per ton f.o.b. Agassiz. The P. Burns fertilizer was a sample but if valued at $60 per ton the cost per acre as applied would be $12.60.

FERTILIZERS FOR MANGELS

Number of plot	Kind and Quantity of Fertilizer Applied per Acre.	Cost of fertilizer per acre	Yield per acre	
		$ cts.	tons	lbs.
1	Superphosphate, 400 pounds, nitrate 100 pounds; potash 100	13 75	22	1,760
2	Superphosphate, 400 pounds nitrate, 200 pounds	14 10	19	80
3	Superphosphate, 400 pounds; potash, 200 pounds	13 40	20	512
4	Superphosphate, 400 pounds; P. Burn's fertilizer 200 pounds	12 60	25	80
5	Superphosphate, 400 pounds	6 60	15	16
6	Potash, 400 pounds	13 60	11	432
7	Nitrate, 400 pounds	15 00	7	620
8	Check no fertilizer		7	64
9	Nitrate, 200 pounds; potash, 200 pounds	14 30	13	240

A complete fertilizer gave better yields than where ingredients were applied singly. This experiment will be continued as no conclusions can be drawn on the results of only one year's work.

HORTICULTURE

The horticultural work this year consisted of the usual variety and cultural experiments with potatoes, vegetables, fruits and flowers, particular stress being laid on the application of fertilizers, different dates of sowing and planting and distances apart at which to sow and plant.

The growing season was too dry to produce very large crops. June, the month in which we usually have a heavy precipitation, gave less than three inches of rain, which was insufficient to bring along the young plants.

A quantity of seed was saved, both of vegetables and flowers, owing to a dry September and October, some of which will be used in trials next season.

With few exceptions we were not bothered to any extent with insect pests and fungous diseases.

VEGETABLES

POTATOES

Varieties.—Jones White, a large, white potato of good shape and quality, was easily first in point of production and can be highly recommended for this district; it is a good keeper. U.B.C., was second in order of merit; this can also be recommended. Sutton Reliance, Carman No. 1, Gold Coin and Wee McGregor are also suited to this locality. Of the early varieties, Early St. George is the best all round potato.

Commercial Fertilizer Applied to Early Potatoes.—An experiment was conducted to determine the value of applying commercial fertilizers to early potatoes for the market at the time when the highest prices are obtainable.

The number of varieties was eight. Twenty sets of each were planted and all had been sprouted before being planted. The sets which were whole small potatoes were planted in drills thirty inches apart and fourteen inches apart in the drills.

The ground had been ploughed in the autumn and manured with sixteen tons barnyard manure to the acre in the spring and then ploughed again.

The sets were planted two inches deep and then slightly hilled up to shed the surplus moisture.

All seed was planted April 2 and all potatoes were harvested June 8. Three-fifths of the fertilizer was applied when tops were well up, and two-fifths just before hilling up. Cultivation was carried on in the usual way.

Fertilizer No. 1 represents an application of 933 pounds superphosphate per acre; No. 2 represents application of 622 pounds superphosphate and 311 pounds nitrate of soda per acre; No. 3 represents application of 467 pounds superphosphate, 233 pounds nitrate of soda and 233 pounds muriate of potash per acre, No. 4, check row, no fertilizer.

Plots given the mixture No. 3 (two parts superphosphate, one part nitrate of soda and one part muriate of potash) gave a better yield than No. 2 (two parts superphosphate, one part nitrate of soda), and No. 2 a better yield than No. 1 (superphosphate of lime only), and No. 1 a better yield than No. 4 which had no fertilizer; No. 3 gave 100 per cent better results than No. 4.

The price of early potatoes when the above crop was harvested was 12 cents per pound.

Cost of fertilizer for No. 1 plot was..	$15 72 per acre
Cost of fertilizer for No. 2 plot was..	22 40 per acre
Cost of fertilizer for No. 3 plot was..	24 73 per acre

BEANS

Varieties.—With one exception, Masterpiece, Sutton, all the bean seed this year was home-grown 1922 crop, most of which did very well; the germination was good in all cases and the season was favourable. Masterpiece was far the best variety in point of yield and is a good tender bean and of good flavour; here the Agassiz grown seed was in front of the Sutton seed. In point of earliness Masterpiece is also good. Hodson Long Pod, Bountiful Green Bush and Canadian Wonder are excellent varieties.

Pencil Pod Black Wax, Davis White Wax, Round Pod Kidney Wax, Challenge Black Wax and Fordhook Favourite all suffered more or less from rust.

Seventeen different varieties were planted.

Cultural Test.—In order to determine the distance apart at which beans should be planted in the row to produce most satisfactory results, two varieties, Round Pod Kidney Wax and Stringless Green Pod were used. All seed was sown May 4 in thirty foot rows. Throughout this experiment the results show that the closer the seed is planted the better the yield and in most cases the quicker the crop matures.

BEETS

Varieties.—Crosby Egyptian was the best in point of yield and is of good quality. Cardinal Globe, which was second, is coarse. Detroit Dark Red Turnip is a good coloured beet and of good flavour but rather coarse. Brand Exhibition is a very good beet in every respect. Five varieties were sown.

Cultural.—Different dates of seeding at intervals of ten days. The fourth sowing May 11 give the best results with the fifth, May 21, second. May appears to be the best time for sowing beets.

BRUSSELS SPROUTS—VARIETY EXPERIMENT

Two varieties of Brussels Sprouts were tried this year viz., Lulu Island, Brand, and Sutton Matchless but were complete failures as the buttons did not form except in a few cases, and these were too loose and open to be of any value.

CABBAGE

Varieties.—The dry weather in June and July was not very favourable for growing cabbage, the crop being much smaller than usual, particularly so in the case of the later varieties. Twelve varieties were tried. Glory of Enkhuizen was by far the best yielder, the heads being large and firm, and was the earliest ready for use with the exception of Sutton Earliest, which was ready the same day. Of the later varieties Improved Flat Dutch was the best followed by the Danish Ball Heads, which are always good, though this year the heads were small. The Savoys were a failure, they did not head up properly.

Dates of Seeding for Storage Purposes.—In this experiment two varieties, Copenhagen Market and Extra Amager Danish Ball Head were used and the seed was sown at intervals of ten days between sowings commencing April 9. Five sowings were made.

In the early variety, Copenhagen Market, the best yield was obtained from the fourth sowing May 11 and the earliest matured head from the second sowing April 20. The late variety, Extra Amager Danish Ball Head, produced the largest crop from the second sowing April 20.

For storage purposes, therefore, it would appear that the early variety should be sown second week in May and the late variety third week in April.

CARROTS

Varieties.—Chantenay and Early Nantes are the two best yielders in the order named. Both are of good shape, colour and flavour, Chantenay being somewhat coarser than Early Nantes. Half Long Scarlet Nantes is a smaller yielder but the best all round carrot tried. Champion Scarlet Horn is the earliest and therefore to be recommended. Nine varieties were tried.

Cultural.—Different dates of seeding at ten-day intervals. The three later sowings were more successful in both the early harvesting and the later harvesting than the earliest sowing, this being partly due to much better germination.

CAULIFLOWER—VARIETY EXPERIMENT

Improved Snowball was the best yielder, heads being of fairly good size and good colour. Early Snowball is also of good quality; Early London was darker in colour and not so good as the former two varieties. Three varieties were tried.

CELERY—VARIETY EXPERIMENT

The heaviest yielder was Solid Ivory, which is a fairly good variety but the stems are very long, 36 inches in most cases, and too thin to be of first rate value. Easy Blanching which was second best yielder, is a good variety, very early and good quality and has thick, firm plants. New Emperor can be highly recommended as an excellent variety with solid thick stems. Paris Golden Yellow was the best of the very early varieties. Many of the other varieties are subject to rust which seriously damages the crop. Fourteen varieties were tried.

CITRONS—VARIETY EXPERIMENTS

Colorado variety, grown from seed raised at the Central Experimental Farm, gave a much greater yield than the commercial grown seed of the same variety.

Colorado is the best variety in every respect as the quality, yield and size of the fruit are much beter than those of the Red Seeded variety.

TABLE CORN

Varieties.—Howling Mob was the largest yielder, closely followed by Golden Bantam, which is the best flavoured variety of all and a universal favourite and earlier than Howling Mob. Picaninny is the earliest of all being ready for use fourteen days before the next variety, Early Malcolm; its cobs, though small in comparison with others, were large for its kind and larger than they were last season. All the ten varieties tried this season were good.

CUCUMBERS—VARIETY EXPERIMENT

The dry, hot season favoured the culture of cucumbers and large crops were obtained from all the varieties tried, Davis Perfect and Early White Spine being exceptionally good. Davis Perfect is the earliest and best all round variety, while Early White Spine is rather course and of inferior flavour to Davis Perfect. All the four varieties tried can be recommended.

LEEKS—VARIETY EXPERIMENT

Of the three varieties tried, Prizetaker was slightly better than the others in weight of crop; there is little to choose between these varieties, all were good and produced excellent specimens of leeks.

LETTUCE—VARIETY EXPERIMENT.

Of the fourteen varieties of lettuce grown this season, by far the best is the New York; it yields well, has a very firm well shaped head, and is of excellent quality, being tender, crisp, and well flavoured. Hanson and Iceberg are the next best varieties to New York. Big Boston was the earliest and is a good variety. Trianon White Self Forcing though the largest yielder was indifferent in every other respect, the heads being loose and coarse. The Cos (Sutton's) yielded fairly well but soon ran to seed. Tom Thumb, a miniature lettuce, made a firm well shaped head and, if planted closely enough together, would give a good yield; it matures quickly and is of good quality.

MELONS—VARIETY EXPERIMENT

Melons did well this year there being no difficulty in ripening. All three varieties tried can be recommended for growing here. Spicy Cantaloupe and Montreal Green Nutmeg were the heaviest yielders, but the small Emerald Gem is the best flavoured and is much earlier.

ONIONS

Varieties.—The Selected Ailsa Craig is by far the best onion we have grown. Its yield is very large, size and shape are good, and flavour excellent; it also keeps well. Both the Red and Yellow Southport Globes are good in yield, shape, uniformity and flavour. Australian Brown is the best keeping onion, and though smaller than Ailsa Craig, yields well and is of uniform shape. Yellow Globe Danvers, an old favourite, did not do as well as usual.

Transplanting vs. Sowing in Open.—To determine whether it is better to sow onions in the hotbed and transplant to the open or sow in the open and

thin out. In all instances the yield was greater where the onions were sown in hot-bed and transplanted to the open, the quality was better, and the size of the individual bulbs larger.

PARSLEY—VARIETY EXPERIMENT

Two varieties of parsley were grown in this test Champion Moss Curled and Extra Triple Curled; both of these are good and yielded well but the quality of the latter was somewhat better.

PARSNIPS

Varieties.—There was little difference in weight of yield between the two varieties tried, Hollow Crown being slightly better than Cooper Champion. The quality and shape of both are good.

Cultural.—Different dates of seeding. Seed was sown at intervals of ten days. The best results were obtained when seed was sown the third week in April though the two latest sowings were the next best, thereby, making the experiment rather contradictory.

PEPPERS—VARIETY EXPERIMENT

This season, owing to the hot dry weather, was very suitable to the growing of peppers; the plants grew strongly and there was no difficulty in ripening the fruit. Two varieties were tried. The Tomato variety yielded a better crop than the New Neapolitan in point of weight but the fruit is small and not so well flavoured as the New Neapolitan; the fruit of the Tomato variety is more solid and has a much thicker skin than the other. New Neapolitan is the more saleable variety as it is more in demand for stuffing, which appears to be the ultimate end of peppers.

GARDEN PEAS

Varieties.—Kerr Dwarf, a true dwarf pea, headed the list for weight of yield; it is a very nice pea and of good flavour and size with well-filled pods. Stratagem was the best of the later varieties. Thomas Laxton was the earliest and is most satisfactory. The germination was poor in Manifold, Market Gardener and Duke of Albany, Rennie.

In all of the varieties grown from Agassiz-grown seed, the germination was good and the crop satisfactory. This season was not very satisfactory for peas.

Distance Apart of Planting in the Row.—In order to determine the best distance apart in the row at which to plant peas, seed was planted at intervals of one inch, two inches, and three inches apart in the rows and three varieties were used in the experiment; all seed was planted on April 10 and a comparison made of the yield of each.

In this experiment the two early varieties, Thomas Laxton and English Wonder, gave a better yield when planted one inch apart than when planted two inches, and better when planted two inches apart than three inches apart; in the later variety, Stratagem, the three inches apart gave the best yield of all.

RADISH—VARIETY EXPERIMENT

French Breakfast, Sutton, was the best radish grown; it yielded the largest crop and produced the best radishes both in shape and quality. Rapid Red was second best; the roots, however, were liable to split and had small tops. Sparkler White Tipped grew very large tops but the roots were inferior to the first two varieties. Six varieties were tried.

RHUBARB—GROWING FROM SEED

Two lots of seed of the Victoria variety one from seed grown at Agassiz Experimental Farm and one from seed grown at the Lethbridge Experimental Station were sown April 10 and germinated well and young plants made good growth.

SQUASH—VARIETY EXPERIMENT

Two varieties, Hubbard and Golden Hubbard, were tried. Hubbard yielded 55 pounds to one hill of three plants; Golden Hubbard yielded 42 1-2 pounds to hill of three plants. Both these varities are good. Golden Hubbard being the better keeper though both keep well till late in the spring.

VEGETABLE MARROW—VARIETY EXPERIMENT

Long Green Marrow was the best in point of yield, but the White Bush Marrow is the better in flavour and is also more economical in ground space taking up less than half the space the trailing varieties do.

TOMATOES

Varieties.—Number of plants of each variety, four. Twenty-six varieties were grown. This season was most favourable for the growing of tomatoes; the fine bright weather of the early autumn thoroughly ripened the fruit, of which there was an excellent crop, and there was no green fruit to be recorded as there has always been hitherto.

Several varieties were grown from Agassiz-raised seed and compared very favourably with the commercial seed of the same varieties.

New White, tried for the first time, proved to be a great yielder leading all others in quantity, but it is a large coarse tomato of poor flavour and owing to its colour, a pale straw, against which there is a prejudice, it is practically unmarketable. Best of All is without doubt the best tomato of all tried, in every respect; the fruit is medium in size, of a good shape and colour, is smooth and thin skinned and will ship well; the flavour is excellent and it is one of the earliest to ripen. Bonny Best, Pink, Victoria Whole Salad, and both the Canners are good; Crimson Canner was the first to ripen, closely followed by Bonny Best.

Cultural.—Methods of pruning to one stem. In order to determine the best method of pruning tomato plants to one stem to increase the earliness of producing ripe, marketable fruit, yield at different pickings and total yield of entire crop, two varieties Alacrity and Bonny Best, twenty-five plants of each variety, were used in this experiment. Rows were two feet apart and plants were one foot apart in the rows. Seed was sown March 27 and plants set out May 29. The plants were headed back to one truss, two trusses, three trusses and not headed back. The result of this experiment as a whole shows that earliness in producing ripe fruit is obtained where the plants are headed back to one, two and three trusses in the order mentioned, though in the case of Bonny Best the plants not headed back were the earliest. In all instances the more trusses the more ripe fruit was obtained as a total yield.

TURNIPS—VARIETY EXPERIMENT

Sutton Soft Garden Swede, an early variety of Swede turnip, was the heaviest cropper and is a good, small, table variety. Early Snowball is very good in every way and is the earliest. Of the extreme late varieties, Imperial was the best. Five varieties were tried.

ORCHARD

APPLES—VARIETY EXPERIMENT

The season of 1923 was favourable to the growing of apples and there was a good yield of most varieties with an increase in the size of the fruit, some being particularly large. Little scab was apparent, and the fruit kept well. The orchard was sprayed twice with lime sulphur solution and once with arsenate of lead as the tent caterpillar threatened to be dangerous. A quantity of young trees were planted to fill up vacant spaces and all are doing well.

PEARS

Dr. Jules Guyot and Bartlett are again near the head of the list in production.

PLUMS—VARIETY EXPERIMENT

This was not a good year for plums; the fruit set badly in most cases. Then a scourge of tent caterpillars attacked them and, in spite of spraying with arsenate of lead, did a lot of damage. To finish disasters, a severe attack of brown rot ruined the crop.

CHERRIES—VARIETY EXPERIMENT

Cherries, like the plums, suffered severely from rot, many varieties being worthless and not recorded. Royal Anne was the worst sufferer.

Of the sweet varieties, Bing, Windsor, and Lambert were the best, but they were badly infected with rot.

Of the sours, which did not have the rot as badly as the sweet varieties, Montmorency and Belle Magnifique were the best. Montmorency, however, is a poor shipper while Belle Magnifique and Olivet ship well.

SMALL FRUITS

STRAWBERRIES

Varieties.—In spite of the very dry season of 1923 there was a good crop of strawberries, Magoon being the heaviest yielder, its fruit was large, of good shape, firm, and an excellent shipper. Royal Sovereign, the favourite for home consumption, is the best flavoured of the varieties grown. Gold Dollar was early, but the yield was small and the size of the fruit small.

Protection of Strawberries from Weevil.—This, the third year with the plot of strawberries surrounded by boards smeared with tanglefoot, did not prove that any success in preventing the appearance of the weevil can be obtained after the second year, as the entire plot was ruined by the weevil. It would seem advisable to plant the young plants in the autumn of one year and crop the next year and the year following and then plough out the plantation and replant elsewhere.

BLACK CURRANTS AND RED CURRANTS—VARIETY EXPERIMENT

Some of the bushes yielded a small amount of fruit but not sufficient to be worth recording; the bushes have made good growth and should yield well next year.

RASPBERRIES—VARIETY EXPERIMENT

The raspberry plantation is now in full bearing and of the two varieties in it, Cuthbert was easily the best both in point of yield and quality. Fillbasket is hard to pick and moulds badly. Cuthbert yielded 130¾ pounds to 100-foot row; Fillbasket 80 pounds to 100-foot row.

Some new varieties have been received from the Central Experimental Farm and have been added to the plantation.

BLACKBERRIES

Varieties.—The blackberry canes are also bearing this year with the following results: Snyder yielded 74½ pounds to 50-foot row; Erie yielded 31 pounds to 50-foot row.

Snyder is the best variety for this locality in point of yield and quality.

Barnyard Manure versus Commercial Fertilizer

An experiment was conducted in fertilizing brackberries. Barnyard manure was applied to a 25-foot row of two different varieties, Snyder and Erie, and commercial fertilizer to a 25-foot row of the same two varieties. In the Snyder variety there was little difference shown between the barnyard manure and the commercial fertilizer but in the Erie variety there was a marked improvement in the yield when the barnyard manure was used over the yield when the fertilizer was used.

LOGANBERRIES—VARIETY EXPERIMENTS

The loganberries wintered fairly well and yielded 37½ pounds of fruit to a 50-foot row of five plants.

GOOSEBERRIES—VARIETY EXPERIMENT

Two bushes of Red Jacket variety yielded 2½ pounds; young bushes have made good growth.

FLOWERS

ROSES—VARIETY EXPERIMENT

The season of 1923 was a good one for roses, they bloomed profusely and the blooms were of good quality though their life was short, the hot, dry weather of June and July bringing them rapidly from bud to decay.

Where all were so good it is hard to say which were the best: Frau Karl Druschki, Margaret Molyneaux, Hugh Dickson, George Dickson, James Coey, Mamam Cochet and the climbing Gloire de Dijon were perhaps the outstanding ones.

SWEET PEAS—VARIETY EXPERIMENT

Thirty-five varieties of sweet peas were sown and all did well, the pick being Mrs. A. Hitchcock (pink flushed salmon), Valentine (bluish pink), Hope (cerise), Barbara (salmon), Wedgewood (blue), Mrs. C. P. Tomlin (crimson scarlet), Royal Purple (purple), and Charity (scarlet).

ANNUALS—VARIETY EXPERIMENT

Three blocks of annuals were sown containing as near as possible the same varieties. One lot of seed was from Sutton and Co.; one from Sutton and Co's. seed of previous year grown at Agassiz; and another lot was grown at Summerland, B.C.

The British Columbia grown seed gave results which compared very favourably with that obtained from Suttons; in some cases they were superior.

The best annuals grown were portulacas, zinnias, salpiglossis, godetias and cosmos.

PERENNIALS

The perennial border was very brilliant in the early part of the season. Doronicum, iris, aquilegia and delphinium combined to make a great showing. As the season progressed the drought had its effect and but for the rudbeckia, helianthus and clematis recta would have been very bare looking.

TREES AND SHRUBS, ORNAMENTAL AND SHELTER

Rhododendrons and azaleas were the best of the flowering shrubs; they have never been better. Magnolias, flowering cherries and crabapples, Japanese dogwood, and yellowwood the best of the flowering trees. Weeping birches and beeches, the tulip tree and copper beeches were the best of the shade trees. The conifers are good, Nordmanns fir, the big tree, and the white pine being the best of a good lot.

HEDGES

Defensive—Hawthorn (*Cratægus*), English holly, European maple and beech the best.

Ornamental—Deautzia, caragana and cypress the best.

CEREALS

LAND AND TREATMENT

The land upon which the cereal crops were produced is a fairly rich sandy loam. In 1921 a crop of rape was grown on it which was pastured off with sheep. In 1922 an application of barnyard manure and commercial fertilizer was given the land and a good crop of mangels produced after which the land was fall ploughed and well worked in the spring previous to sowing grain. All cereals were well cleaned and treated with formalin as a smut preventive before sowing. The first grain sown was peas, on April 11.

OATS—TESTS OF VARIETIES OR STRAINS

Thirteen varieties of oats were tested. Victory, one of the most popular varieties, gave the highest yield, with a new variety, Prolific Ottawa 77 (which did very well last year in second place, followed by O.A.C. No. 72 and Gold Rain. Banner Ottawa 49 yielded poorly and so did Daubeney Ottawa 47, the latter being the earliest variety tested. The two hulless varieties Laurel Ottawa 477 and Liberty Ottawa 480, gave the lowest yields.

BARLEY—TESTS OF VARIETIES OR STRAINS

Eleven varieties of barley were tested, the best yielder being Hannchen, followed by Gold, Danish Chevalier and Duckbill Ottawa 57, all two-row varieties. The best six-row varieties were Oderbruch and O. A. C. No. 21. The earliest kinds were Success, Albert Ottawa 54, and Himalayan Ottawa 59, all six-row varieties, the latter being hulless.

PEAS—TEST OF VARIETIES OR STRAINS

Only two varieties were tested, Solo and Arthur. These are two good kinds, Solo being a grey pea and Arthur a white one. They each yielded the same, 660 pounds per acre.

BEANS—TEST OF VARIETIES OR STRAINS

Five varieties of beans were tested. They were sown in drills 28 inches apart. The same varieties gave the best yields as last year, i.e., Navy Ottawa 711 and Norwegian Ottawa 710.

MIXED PEAS AND OATS—TEST OF VARIETIES OR STRAINS

A mixture of Arthur peas and Banner oats gave a higher yield than Solo peas and Banner oats. Similar results were secured the three preceding years.

OATS FOR HAY—TEST VARIETIES OR STRAINS

Five varieties of oats were grown for hay in plots. Columbian Ottawa 78 a variety only tested for the past two years, gave the highest yield each time. Prolific Ottawa 77 another new variety, gave the second best yield but did poorly last year. Daubeney Ottawa 47, a variety with straw of fine quality, gave the lightest yield as is usually the case.

FORAGE CROPS

The severe drought experienced from June 1 to the end of the growing season was the direct cause of many forage crops giving low yields. The roots suffered the most in this respect particularly the mangels. One of the heaviest crops of hay on record was saved in excellent condition. The drought did not affect this crop to any extent, particularly the first cutting. Corn and sunflowers, although late in starting, made rapid growth later and gave average yields.

An attempt was made to secure the weights of total dry matter from each of the different crops grown. Owing to the extreme amount of work entailed, the dry matter content of the roots was not secured although the samples were taken. The total dry matter content of crops forms a more equitable basis of comparison, in determining their value, than the total green weight.

SOIL AND MANURING

The hoed crops were grown on land that had been in pasture the previous year. The root land was ploughed in the fall, re-ploughed in the spring and well worked. Barnyard manure was applied in the autumn at the rate of twelve tons per acre, and at time of planting the seed, an application of commercial fertilizer consisting of 100 pounds nitrate of soda, 100 pounds muriate of potash and 400 pounds superphosphate of lime per acre was applied. The corn and sunflower land was ploughed only in the spring and well worked previous to planting.

CORN FOR ENSILAGE—TEST OF VARIETIES AND STRAINS.

Of the sixteen strains of corn tested, White Cap Yellow Dent gave the highest yield of dry matter, although only fifth in total green weight. This variety is making a good record here recently. The large, late varieties like Wisconsin No. 7 and Leaming yielded well while the early varieties such as Twichell and Quebec 28 gave poor yields. For this district average season varieties of corn like Longfellow, Golden Glow and North Western Dent give good results and are recommended. The corn was grown in one-hundrédth acre plots, sown in hills, three feet apart each way.

INDIAN CORN FOR ENSILAGE—TEST OF VARIETIES

Name of Variety	Average height	Condition when cut	Average yield per acre			
			Green weight		Dry matter	
	ins.		tons	lbs.	tons	lbs.
Wisconsin No. 7 (Duke)	100	Glazed	20	800	3	1678
Leaming (Parks)	96	"	20	150	2	1698
Wisconsin No. 7 (Parks)	100	"	20	–	4	112
Compton's Early (Duke)	96	"	19	1400	3	1986
White Cap Yellow Dent (Steele Briggs)	90	"	19	1000	4	591
White Dent (Disco 90 day Lot 1318)	96	"	19	950	3	1399
Longfellow (Disco Lot 1099)	96	"	18	1850	3	1626
Golden Glow (Duke)	96	"	18	850	3	885
Longfellow (Duke)	84	"	18	650	3	649
Northwestern Red Dent (Disco Lot A.B.)	72	Almost ripe	17	1500	3	1896
Leaming (Duke)	96	Glazed	17	250	3	1059
North Dakota (Steele B.)	72	"	17	200	3	1335
Twichell (Fredericton)	60	Ripe	11	300	3	12
Yellow Dent (Disco Pride Lot 1015)	60	Almost ripe	11	100	2	1819
Quebec 28 (Macdonald College)	60	Ripe	10	1750	3	1244
Northwestern Dent (15-7727 E McKenzie)	60	Almost ripe	9	1550	2	1715

SUNFLOWERS FOR ENSILAGE—TEST OF VARIETIES AND STRAINS

Four varieties or strains of sunflowers were grown under similar conditions to those of corn. Mammoth Russian, although not so early as the other varieties, gave much the greater yield.

MANGELS—TEST OF VARIETIES AND STRAINS

Twenty varieties or strains of mangels were grown in duplicate uniform one-hundredth acre plots. The Sludstrup variety, Denmark, Steves and McDonald strains, did well while two other strains yielded poorly. Yellow Intermediate and Selected Giant Rose Intermediate also did well.

MANGELS—TEST OF VARIETIES

Date sowing, May 16. Date harvesting, Oct. 23.

Number	Variety	Average yield per acre			
		tons	lbs.	bush.	lbs.
1	Runkilroofro, Barres Sludstrup No. 3084 (Trifolium, Denmark)	19	605	772	5
2	Yellow Intermediate (C.E.F.)	19	395	767	45
3	Danish Sludstrup (Steves)	18	1940	758	40
4	Selected Giant Rose Intermediate Sugar	18	1520	750	20
5	Runkilroofro Barres Stryno V. No. 7034 (Trifolium)	18	1450	749	–
6	Giant Yellow Globe (Ewing)	18	1240	744	40
7	Danish Sludstrup (McDonald)	18	1240	744	40
8	Jumbo (Rennie)	17	1070	701	20
9	Giant Yellow Globe (Rennie)	16	900	658	–
10	Green Top White Sugar (Ewing)	15	1850	637	–
11	Golden Tankard (Ewing)	15	1570	631	20
12	Leviathan (Rennie)	15	775	615	25
13	Golden Tankard (Rennie)	15	625	612	25
14	Yellow Leviathan (Rennie)	15	520	610	20
15	Mammoth Long Red (Ewing)	14	1540	590	40
16	Half Sugar Rose No. 1141 (Trifolium, Denmark)	14	1470	589	20
17	Perfection Mammoth Long Red (Rennie	14	665	573	15
18	Danish Sludstrup (Dup. & Ferguson)	14	630	572	30
19	Danish Sludstrup (Ewing)	13	1300	546	–
20	Long Yellow (Ewing)	13	1125	542	25

CARROTS—TEST OF VARIETIES AND STRAINS

Thirteen varieties or strains of carrots were grown under similar conditions to the mangels. The White Intermediate and Short White varieties gave the best yields and are always desirable varieties to grow in this district.

SUGAR BEETS—TEST OF VARIETIES AND STRAINS

Four varieties of sugar beets were grown in single plots to determine their yields and factory value for sugar. Chatham gave the highest yield of good roots but they had the lowest sugar content. Kitchener had the highest percentage of sugar in juice but was third in yield.

SUGAR BEETS—TEST OF VARIETIES

Sowed May 16. Harvested October 25.

No.	Variety	Plot yield per acre				Remarks
1	Chatham (Dominion Sugar Co.)	12	1480	509	30	Uniform, good clean roots. Stand 100%.
2	Henning and Harvings, Denmark (Dominion Sugar Co)	11	400	448	–	Various sizes, prongy, not uniform. Stand 98%.
3	Kitchener (Dominion Sugar Co.)	10	1980	439	30	Various sizes, prongy not uniform. Stand 100%.
4	Sleuice Bros. Holland, (Dom. Sugar Co.)	10	650	413	–	Not very clean or smooth. Stand 96%. All beets were small.

SUGAR VALUE OF BEETS

Variety	Sugar in juice	Co-efficient of Purity	Average weight of one root	
	p.c.	p.c.	lb.	oz.
Kitchener	18·55	93·46	1	1
Sluice Bros	17·36	90·14	1	2
Chatham	17·24	92·49	1	2
Henning & Harving	17·36	92·00	1	0

ANNUAL HAY CROPS—TEST OF VARIETIES AND STRAINS

Thirteen plots of annual hay crops were grown, one-hundredth acre in size, White, Yellow, and Hubam sweet clover and sudan grass failed completely. Japanese millet gave the highest yield with the other crops giving fair results.

ANNUAL HAY CROPS

Name	Date sown	Date cut	Average yield per acre			
			Green weight		Cured Hay	
			tons	lbs.	tons	lbs.
Oats.						
Columbian Ottawa 78	May 21	July 31	5	1700	2	1400
Banner Ottawa 49	" 21	" 31	5	1600	2	1250
Prolific Ottawa 77	" 21	" 31	5	1200	2	1300
Longfellow Ottawa 478	" 21	" 31	5	700	2	1250
Daubeney Ottawa 47	" 21	" 28	4	1300	2	–
Barley						
Success	" 21	" 28	5	600	2	550
Millets						
Japanese	" 21	" 28	9	1100	2	1750
Hungarian	" 21	" 28	8	1250	2	900
Rye						
Spring Rye	" 21	" 28	5	900	2	1200

GRASSES AND CLOVERS—TEST OF VARIETIES AND STRAINS

In the spring of 1922 a set of plots was laid out and sown to several strains and varieties of common red and white dutch clover and timothy, some of the seed coming from Europe and some from different points in Canada. The seed was sown with oats as a nurse crop in plots one-hundredth-acre in size, some in duplicate while others were single plots. Combined with the strain tests were some inoculation experiments. A somewhat similar set of plots was sown in 1923 but owing to weather and soil conditions they got a poor start and were destroyed.

VARIETY AND STRAIN TESTS OF TIMOTHY

Name	Number of cuttings	Average yield per acre					
		Green weight		Cured Hay		Dry Matter	
		tons	lbs.	tons	lbs.	tons	lbs.
Ohio 3937 Huron	1	8	650	3	1064	3	223
Ohio 6779	1	8	150	3	757	2	1926
Grand Prairie	1	7	1150	3	365	2	1579
Ohio Commercial	1	7	650	3	801	2	1943
Ottawa B.K. 1921	1	7	650	3	298	2	1503
Ohio 9647	1	6	1650	3	258	2	1442

VARIETY AND STRAIN TESTS OF RED CLOVERS

Name	Number of cuttings	Single or duplicate plots	Average yield per acre					
			Green Weight		Cured Hay		Dry Matter	
			tons	lbs.	tons	lbs.	tons	lbs.
Early Swedish	2	Duplicate	18	1550	3	1729	2	1758
Ottawa 1916-20	2	"	17	1950	3	1200	3	298
St. Clet, Que	2	"	17	1450	4	802	3	1179
Ottawa district	2	"	17	600	4	147	3	990
Ottawa C.E.F., L.R. 21	2	Single	16	1200	3	1020	3	178
Ottawa 1917-20	2	"	16	300	3	1182	3	252
Mammoth	2	"	14	1500	2	1180	2	646
St. Casimet, Que	2	"	14	500	3	375	2	1589
Altaswede	1	"	13	500	3	1285	3	254
Medium Late Swedish	1	Duplicate	13	100	2	1898	2	1115
Late Swedish	1	"	13	100	2	1844	2	1199
France	2	Single	12	600	2	1339	2	648
Kenora S.G.A.	1	"	8	1200	1	1680	1	1182

VARIETY AND STRAIN TESTS OF WHITE DUTCH CLOVERS

Name	Number of cuttings	Single or duplicate plots	Average yield per acre					
			Green Weight		Cured Hay		Dry Matter	
			tons	lbs.	tons	lbs.	tons	lbs.
Ladino	2	Duplicate	17	1000	2	1475	2	707
Kentish Wild	2	"	13	1200	.....	.....	.....	.....
Danish "Stryno"	1	Single	8	700	1	571	1	204
Commercial	1	Duplicate	8	550	.....	.....	.....	.....
Scottish Wild	1	"	6	1150	.....	.....	.....	.....
Danish "Morso"	1	"	6	950	.....	.....	.....	.....

Variety	Date sown 1922	Date cut 1923	Yield per acre						Remarks
			Green weight		Cured hay		Dry Matter		
			tons	lbs.	tons	lbs.	tons	lbs.	
Alfalfa (inoculated).....	May 10..	June 23...	7	1200	2	560	1	1952	Only a fair crop.
Alfalfa (not inoc.).....	" 10..	" 23...	–	–	–		–	–	Failure.
White sweet clover (inoculated).....	" 10..	" 23...	7	1200	1	1678	1	1161	Only a fair crop.
White sweet clover (not inoculated).....	" 10..	" 23...	–	–	–	–	–	–	Failure.
Yellow sweet clover (inoculated).....	" 10..	" 12...	5	–	–	–	–	–	Not much of a crop
Yellow sweet clover (not inoculated).....	" 10..	" 12...	–	–	–	–	–	–	Failure.
Red clover (inoculated)	" 10..	" 12...	7	1000	1	1000	1	595	
Red clover (inoculated) 2nd cut.....	" 10..	" 24...	10	500	1	1669	1	1259	
Red clover (not inoculated).....	" 10..	June 12...	8	400					
Red clover (not inoculated) 2nd cut.....	" 10..	July 24...	9	1700	1	1486	1	902	

Poor crops of sweet clover and alfalfa were secured, but the advantage of inoculation is apparent. In harmony with previous results secured, this experiment demonstrates that inoculation of red clover is unnecessary here.

EXPERIMENTS WITH FERTILIZERS

The fertilizer experiment (E21) commenced in 1921 was continued, the object being to determine the most profitable combination and quantity of a fertilizer mixture, as measured by its influence in relation to cost, throughout a three-year rotation. The rotation consists of mangels, grain and hay.

POULTRY

The stock on hand at the end of the year consisted of the following: Three hundred and thirty-three Barred Plymouth Rocks, and one hundred and thirty S.C. White Leghorns, or a total of four hundred and sixty-three birds. All hens were trapnested, accurate egg records being kept of each individual bird.

INCUBATION

The first chicks were hatched on March 7 and the last on May 30, the incubator used being the Mammoth Candee.

The average fertility was 79·7 per cent but the number of chicks hatched was only 17·9 per cent of the total eggs or 22·8 per cent of the fertile eggs. Sixty-two per cent of the chicks lived to maturity. A considerable amount of custom hatching was carried on at a charge of three cents per egg.

EGGS SOLD FOR HATCHING

The demand for Barred Rock hatching eggs was considerably higher than was possible to meet. Seventy-five settings were sold. Very few settings of White Leghorns were sold.

BREEDING STOCK SOLD

For breeding purposes, forty Barred Rock cockerels were disposed of but there was little demand for White Leghorn cockerels.

As evidenced by the increasing demand for Barred Rock hatching eggs and cockerels it would seem that the general purpose type of bird is gaining ground in British Columbia.

PEDIGREE BREEDING

As far as can possibly be carried on, all breeding stock is pedigreed. With the trapnesting of all hens, the keeping of pedigree and mating records, assisted by careful selection with strict adherence to Standard type, the aim is to maintain birds typical of the breed they represent and yet conforming to high standards of egg production at the same time.

FEEDING

Commercial Feeds versus Home Mixture.

Commencing November 15, 1922, and continuing until May 15, 1923, an experiment was carried on comparing various scratch foods and mashes with the home mixed scratch and mash in general use on the plant, the purpose of the experiment being to arrive at something conclusive concerning various commercial poultry feeds on the market.

For the experiment ten pens consisting of ten birds in each case were made up. Five of these pens contained Barred Rock pullets the other five being composed of White Leghorn pullets. There were five different scratch grains and mashes used, one pen of rocks and one pen of Leghorns being fed one of the respective feeds in each case. As far as the feeding of green feed, milk, grit and shell were concerned all birds wre fed alike. Water was kept before the birds at all times.

The feeds used were:—

Home Mixture.—Scratch grain consisting of equal parts oats, wheat and cracked corn. Mash, composed of 100 parts bran, 100 shorts, 100 corn meal, 100 crushed oats, 50 beef scrap and 25 charcoal.

Commercial Mixtures.—Scratch grain and mash from each of the following firms:—No. 1, McLellan & McCarter, Vancouver; No. 2, Vernon & Buckerfield, Vancouver; No. 3, Vancouver Milling & Grain Co., Mission; and No. 4, Brackman-Ker Milling Co., Westminster.

The accompanying table gives an indication of results for the period of six months during which the experiment was carried on:—

	Eggs		Total eggs	Value of Eggs		Total value of eggs	Cost of Feed		Total cost of feed	Gain		Total gain
	B.R.	W.L.		B.R.	W.L.		B.R.	W.L.		B.R.	W.L.	
				$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
Home Mixture	994	984	1978	29 82	29 52	59 34	14 13	11 49	25 62	15 69	18 03	33 72
Com. Mixture No. 1	954	955	1909	28 62	28 65	57 27	14 75	12 13	26 88	13 87	16 52	30 39
Com. Mixture No. 2	881	884	1765	26 43	26 52	52 95	12 74	11 29	24 03	13 69	15 23	28 92
Com. Mixture No. 3	966	861	1827	28 98	25 83	54 81	15 03	11 61	26 64	13 95	14 22	28 17
Com. Mixture No. 4	860	885	1745	25 80	26 55	52 35	13 99	13 36	27 35	11 81	13 19	25 00

B.R.—Barred Rock.
W.L.—White Leghorn.
Prices:—Scratch Grain—Home mixture, $43; Commercial mixture No. 1, $50; Commercial mixture No. 2, $48; Commercial mixture No. 3, $50; Commercial mixture No. 4, $49.
Prices:—Mash—Home mixture, $46; Commercial mixture No. 1, $59; Commercial mixture No. 2, $47; Commercial mixture No. 3, $56; Commercial mixture No. 4, $55.
Grit, $32; Shell, $38; Green feed, $5; Milk, 50 cents per 100 pounds.

The results are in favour of the home mixture for this particular occasion. This might be the case generally where the poultryman can purchase feeds in large quantities when prices are low. On the other hand when it is possible to obtain satisfactory commercial poultry feeds from reliable firms the question of spending time in mixing up feeds must be considered. Time spent in mixing the feed costs money. It is for the poultryman to decide whether or not that time can be spent more profitably otherwise.

CONFINEMENT VERSUS RANGE

This experiment which was commenced on November 29, 1921, to be carried on yearly for five or more years, has now completed its second period, this stage dating from November 15, 1922 until November 15, 1923.

For this period two pens of Barred Rocks and two of White Leghorns were chosen, comprising seventeen pullets in each pen. By the following table results for the second year are shown:—

CONFINEMENT VS RANGE

Pen	Grain	Mash	Milk	Grit	Shell	Green feed	Total cost of feed	Eggs laid	Value	Cost per dozen	Pounds feed per dozen eggs	Health and condition of birds	Death rate	Gain per bird
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	$ cts.		$ cts.	cts.			p.c.	$ cts.
B.R. Range	899·5	591·0	728	12	43	728	37 73	2810	84 30	16	12·8	Fair	20·9	2 74
B.R. Confined	918·5	655	728	8·7	45·5	728	40 78	3284	98 52	15	11·2	Good	5·8	3 33
W.L. Range	862·5	533	728	5·5	53·5	728	36 89	3626	108 78	12	9·6	Good	5·8	4 22
W.L. Confined	911	508·9	728	13·6	64·7	728	37 69	3418	102 54	13	10·4	Good	.....	3 81

Prices:—Scratch grain, $42; mash, $46; grit, $32; shell, $37; green feed, $5; milk, 50 cts. per 100 pounds.
Grain consisted of equal parts wheat, oats and cracked corn.
Mash consisted of 100 parts bran, 100 shorts, 100 crushed oats, 100 corn meal, 50 beef scrap and 25 charcoal.

Contrary to the findings of the previous year, results of the foregoing are in favour of the confined birds. This is not unlooked for in the case of the Leghorns but it is unusual with the Barred Rocks. As far as the Barred Rock range pen is concerned, on this occasion there seemed to have been a run of what one might call just bad luck. The number of deaths affected results and yet these might have happened anyway and were not the direct result of range conditions. As this experiment is continued from year to year the results will increase in interest.

EFFECT OF CONFINEMENT VERSUS RANGE ON HATCHING RESULTS

From the Barred Rocks used in the first year of the experiment, ten of the best birds from the range pen, and likewise ten from the confined pen were selected the second year, allowed range, and bred.

REGISTRATION

Out of ten Barred Rocks entered in the British Columbia Egg Laying Contest, seven qualified for registration and of the ten White Leghorns entered, three qualified.

EGG LAYING CONTEST

October 30, 1923, saw the completion of the third British Columbia Egg Laying Contest conducted at Agassiz by the Experimental Farms Branch. Satisfactory as were the results of the first two contests, they were considerably eclipsed by those of the third contest.

Thirty-six pens of ten pullets each, representing six of the various utility and egg laying breeds were represented. These were as follows:—

	Pens
S. C. White Leghorns	22
Blue Andalusians	1
White Wyandottes	4
Rhode Island Reds Rose Comb	1
Rhode Island Reds Single Comb	1
Buff Orpingtons	2
Barred Plymouth Rocks	5

The method of housing, handling and feeding the birds was the same as was carried on the previous year, a detailed description of which may be found in the 1922 Report of the Agassiz Experimental Farm. This method having given good results hitherto it was thought wise to make no change for another year. For full information on the laying Contest see the 1922-23 Annual Report of the Canadian National Egg Laying Contests.

The most striking feature in the third British Columbia Contest is the highly satisfactory egg average of 199.85, or almost 200 eggs per bird.

In the matter of qualification for registration, there is a marked increase in the number of birds which qualified as compared to the number qualifying the previous year out of the same total. One hundred and fourteen birds qualified in the contest just ended.

It is interesting to note that a Barred Rock pen again led the contest as in the previous year while a White Wyandotte took highest individual honours with a score of 306 eggs as compared to 307 eggs recorded by a White Wyandotte in the previous contest. The American (or general purpose) breeds continue tc give the mediterranean (or light) breeds a strong race for highest honours both in pen records and individual records.

As registration of poultry, which is only in its infancy at present, develops, it is anticipated that the keen interest shown in the Agassiz contest hitherto will become all the more intensified.

BEES

Four colonies of bees were wintered outside in single cases and at the first examination in the spring, March 27, were found to be in excellent condition. During the summer these colonies produced 728 pounds of honey and two new colonies. Two two-pound packages of bees, including queens, were purchased on April 26; one of these produced 176 pounds of surplus honey while the other failed to produce a surplus owing to loss of queen.

For the purpose of testing the value of summer protection on honey yields, two colonies were left in Kootenay cases during the summer and compared with two colonies in single walled hives only. The average yield from the two colonies in Kootenay cases was 217.5 pounds and for the two colonies in single walled hives 146.5 pounds. It should be noted, however, that one of the colonies in a single walled hive failed to make a spring surplus, due to an unprolific queen while the other colonies averaged 40 pounds gain at this time.

The importance of having each colony headed with a good queen was clearly demonstrated in the two packages of bees purchased. One contained a good queen and, besides building up into a strong colony, produced 176 pounds of surplus honey, while in the other package, the queen began to fail three days after arrival and in two weeks had ceased laying. Before another queen was introduced the main flow was over and, instead of being a producer, this colony required 59 pounds of honey to feed it.

HEMP AND FIBRE FLAX

FLAX

Some experimental work relative to the suitability of this district for growing flax for fibre was carried on. Five varieties were grown on one-fortieth-acre duplicate plots. They were sown April 25 and harvested the last week in July. The report on the quality of the fibre was excellent. The fibre was long, strong, open and equal to the first grade Irish flax.

VARIETY TESTS

Of the five varieties tested Longstem gave the highest yield of fibre and tow, 950 pounds per acre, but the lowest yield of seed, 12·5 bushels per acre. Saginaw, an American variety, stood second with a yield of 890 pounds of fibre and tow and 13.2 bushels of seed per acre. Riga Blue gave the third highest yield of fibre and tow.

DATES OF SOWING

In order to determine the most satisfactory date to sow flax, four different sowings were made—the first on April 25, the second on May 2, third on May 9, the last on May 16. The plots sown on May 9 produced the highest yield of fibre and tow. The fibre from the last sowing was shorter than that obtained from the earlier seeding.

HEMP

One plot of Minnesota No. 8 hemp was sown in duplicate April 25 and harvested August 31. The quality of the hemp was excellent the yields being as follows:—

Weight of dry straw per acre	7,120 pounds
Weight of long fibre per acre	640 pounds
Weight of tow per acre	560 pounds

AUTUMN SOWING

Duplicate plots one-fortieth-acre in size, of Minnesota No. 8 and Chington hemp were sown October 20. The object of the experiment is to determine the possibility of autumn sown hemp producing seed the following year. At present hemp seed is purchased in the Southern States and Italy and if it can be grown in British Columbia successfully it should be a valuable crop.

EXTENSION AND PUBLICITY

In co-operation with the other three British Columbia Farms, an agricultural exhibit was staged at the Vancouver Exhibition in charge of the Agassiz Experimental Farm Assistant. A good exhibit of flowers was made at the local Flower Show held June 20. An interesting poultry exhibit, emphasizing the work of the Agassiz Laying Contest was staged at the New Westminster Exhibition. Six Clydesdale horses were also shown at this Exhibit, Melita Pride—45641—a four-year-old mare bred on the farm, won the yeld mare class and the grand championship. Other placings won were as follows: Two-year-old stallion, first; yearling stallion, second; brood mare, first; two-year-old filly, second; foal, fourth; get of sire, second; and produce of mare, third.

At the Chilliwack Ploughing Match held in November, the chief horseman for the farm won the grand championship for ploughing and also first prize for the best ploughing team and turnout.

Numerous other opportunities for agricultural extension work were taken advantage of; the superintendent and his officers judging at many exhibitions and assisting in the organization and administration of local agricultural societies. Numerous articles on the work of the Agassiz Experimental Farm were prepared for the press.

GENERAL FARM NOTES

The old cement floor in the dairy which had been patched and repaired several times and had never been satisfactory, was taken out and a new one put in. This building was also redecorated and painted throughout inside. The old cement floor in a portion of one of the aisles in the cow barn was replaced by a new one, and a new cement floor was also built between four box stalls, where previously there had been only gravel. A cement floor was also put in the aisle of the sheep barn replacing a broken floor. A complete new sewerage system was installed at the boarding-house, including a new cesspool, sewer tile and rock pit. It is giving good satisfaction. A shed was built over the platform scales of sufficient size to allow a load of hay to pass through. A portion of this building is used for storing the oil equipment, which includes up-to-date gas and kerosene tanks and pumps, besides grease, machine and lubricating oils. This building and also the implement shed were painted outside. Considerable repair work was done to fences but no new permanent fence was erected. The balance of the stumps were blown on that portion of land at the east side of the farm, south of the centre road. Some of these stumps are still to burn when the land will be levelled, ploughed and put into crop next spring.

EXPERIMENTAL PROJECTS UNDER WAY AT EXPERIMENTAL FARM, AGASSIZ, B.C.

ANIMAL HUSBANDRY

DAIRY CATTLE

Project No.	Title.
A 1.	Corn silage vs. clover silage for dairy cows.
A 2.	Mangels vs. turnips for milch cows.
A 13.	Corn silage vs. sunflower silage for milch cows.
A 14.	Dried beet pulp vs. roots for milch cows.
A 57.	R.O.M. milk records.
A 58.	R.O.P. milk records.
A 59.	Cost of rearing dairy bred calves and heifers.
A 86.	Testing of milking machines.
A 94.	Treating contagious abortion in dairy cattle.
A 204.	Dairy cattle grading experiment.
A 205.	Supplying pure-bred dairy sires at reasonable prices.
A 206.	Elevator screenings vs. barley for milch cows.
A 207.	Exhibition work with dairy cattle.
A 208.	Skim-milk vs. whole milk for calf rearing.
A 209.	Clipped vs. unclipped calves.
A 210.	Mangels vs. potatoes as succulence for dairy cows.
A 211.	Corn silage vs. pasture for summer feeding.
A 212.	Sunflower silage vs. clover silage for dairy cows.
A 213.	Peanut meal vs. cornmeal for dairy cows.
A 214.	Corn silage vs. peas and oat silage for dairy cows.
A 215.	Clover silage vs. peas and oat silage for dairy cows.

DAIRY

A 81.	Manufacture of cream cheese.
A 98.	Manufacture of Stilton cheese.
A 99.	Manufacture of Pont L'Eveque cheese.
A 100.	Manufacture of butter.
A 201.	Manufacture of Agassiz Wensleydale.
A 202.	Manufacture of Roquefort cheese.
A 203.	Manufacture of Cheshire cheese.
A 251.	Control of the bacteria count in milk.

HORSES

A 294.	Cost of rearing horses.
A 299.	Cost of wintering idle work horses.
A 335.	Exhibition work with horses.
A 336.	Cost of maintaining brood mares.

SWINE

A 120.	Self-feeding vs. trough feeding of swine.
A 143.	Skim-milk as a feed for young pigs.
A 147.	Feeding hogs inside vs. outside.
A 156.	Comparison of breeds and cross-bred swine in feeding characteristics.
A 160.	Cost of rearing litters to weaning.
A 164.	To determine the age at which to breed gilts.
A 165.	Potatoes for hog feeding.
A 166.	Cost of maintaining the herd boar.
A 167.	Farrowing records of brood sows.
A 352.	Fish meal vs. soy-bean meal vs. oilcake meal for pigs.

SHEEP

A 302.	Rape pasture for sheep and lamb feeding.
A 310.	Grading up the flock with pure-bred rams.
A 311.	Cost of maintaining breeding ewes.
A 313.	Improved methods of breeding pure-bred sheep.

Project No.	Title.
A 321.	Comparison of Oxford vs. Dorset rams for grading.
A 322.	To determine the most profitable season for lambing
A 324.	Co-operative marketing of wool.
A 325.	Exhibition work with sheep.
A 326.	Whole vs. crushed oats for sheep feeding.
A 327.	Spring vs. fall shearing of sheep.
A 328.	Breeding as lambs vs. breeding as shearlings.

FIELD HUSBANDRY

ROTATION EXPERIMENTS

F 20.	Four-year rotation—corn, sunflowers, roots and potatoes; oats or oats and peas, clover, pasture.

CULTURAL EXPERIMENTS

F 48.	Preparation of land for grain.
F 50.	Preparation of land for root and potato crops.

MANURE AND COMMERCIAL FERTILIZER EXPERIMENTS

F 76.	Quantities of manure and place in rotation of applying manure.
F 80.	Commercial fertilizers for grain.
F 81.	Commercial fertilizers for hay.
F 83.	Commercial fertilizers for root crops.
F 84.	Commercial fertilizers for silage crops.

FARM MANAGEMENT EXPERIMENTS

F 88.	Yield and profit from root and silage crops.
F 90.	Cost of operating tractor.
F 91.	Cost of producing farm crops.
F 93.	Fencing.

HORTICULTURE

POMOLOGY

H 2.	Blackberry, variety experiment.
H 4.	Currant, variety experiment.
H 6.	Gooseberry, variety experiment.
H 325.	Loganberry, training experiment.
H 11.	Raspberry, variety experiment.
H 391.	Strawberry, fertilizer experiment.
H 382.	Strawberry, protection from weevil.
H 21.	Strawberry, variety experiment.
H 33.	Apple, variety experiment.
H 35.	Cherry, variety experiment.
H 44.	Pear, variety experiment.
H 48.	Plum, variety experiment.

VEGETABLE GARDENING

H 61.	Bean, variety experiment.
H 63.	Bean, weekly sowings for yield.
H 67.	Bean, thinning experiment.
H 68.	Bean, variety experiment.
H 70.	Brussels Sprouts, variety experiment.
H 385.	Cabbage, fertilizer experiment.
H 74.	Cabbage, hotbed vs. sown in the open.
H 75.	Cabbage, protection from maggot.
H 77.	Cabbage, variety experiment.
H 82.	Carrot, thinning experiment.
H 83.	Carrot, variety experiment.
H 386.	Cauliflower, fertilizer experiment.
H 86.	Cauliflower, protection from root maggot.
H 88.	Cauliflower, variety experiment.
H 94.	Celery, variety experiment.

Project No.	Title.
H 309.	Citron, variety experiment.
H 387.	Corn, fertilizer experiment.
H 102.	Corn, variety experiment.
H 281.	Cucumber, fertilizer experiment.
H 106.	Cucumber, variety experiment.
H 112.	Leek, variety experiment.
H 116.	Lettuce, variety experiment.
H 122.	Melmon, Musk, variety experiment.
H 379.	Onion, autumn vs. spring fertilizing.
H 389.	Onion, fertilizer experiment.
H 137.	Onion, transplanted vs. sown in the open.
H 138.	Onion, variety experiment.
H 378.	Onion sets, variety experiment.
H 140.	Parsley, variety experiment.
H 144.	Parsnip, thinning experiment.
H 145.	Parsnip, variety experiment.
H 150.	Pea of different seasons vs. one variety planted at different dates.
H 153.	Pea, variety experiment.
H 157.	Pepper, variety experiment.
H 162.	Potato, different dates of planting to obtain best yield.
H 164.	Potato, different sizes of sets.
H 165.	Potato, distances of planting.
H 383.	Fertilizer experiment.
H 166.	Potato, few vs. many cultivations.
H 172.	Potato, hill vs. level cultivation.
H 180.	Potato, seed treated with plaster vs. not treated.
H 384.	Potato, soil insecticides.
H 183.	Potato, sprouted vs. unsprouted for earliness.
H 186.	Potato, variety experiment.
H 188.	Pumpkin, variety experiment.
H 192.	Radish, variety experiment.
H 194.	Rhubarb, forcing experiment.
H 356.	Rhubarb, growing for seed.
H 197.	Salsify, variety experiment.
H 201.	Squash, variety experiment.
H 388.	Tomato, fertilizer experiment.
H 207.	Tomato, methods of training.
H 211.	Tomato, variety experiment.
H 390.	Turnip, protection from root maggot.
H 214.	Turnip, variety experiment.
H 216.	Vegetable Marrow, variety experiment.

ORNAMENTAL GARDENING

H 261.	Annual flowers, variety experiment.
H 380.	Antirrhinums, variety experiment.
H 263.	Aster, variety experiment.
H 276.	Iris, variety experiment.
H 278.	Narcissus, variety experiment.
H 287.	Sweet Peas, variety experiment.
H 290.	Tulip, variety experiment.
H 298.	Hedges, variety experiment.
H 307.	Trees and Shrubs, ornamental and shelter, variety experiment.

CEREALS

Ce. 1.	Common spring wheat, test of varieties or strains.
Ce. 5.	Oats, tests of varieties or strains.
Ce. 6.	Barley, test of varieties or strains.
Ce. 7.	Field Peas, test of varieties or strains.
Ce. 8.	Field Beans, test of varieties or strains.
Ce. 59.	Tests of peas and oats in combination for grain.

FORAGE CROPS

Ag. 1.	Indian Corn, variety tests for ensilage purposes.
Ag. 16.	Mangels, variety tests for yield and purity.

Project No.	Title.
Ag. 17.	Mangels, breeding for pure strains.
Ag. 36.	Carrots, variety tests for yield and purity.
Ag. 66.	Sugar Beets, variety tests for yield and purity.
Ag. 76.	Sunflowers, variety test for yield and purity.
Ag. 127.	Alfalfa, inoculation.
Ag. 146.	Red Clover, variety tests for yield and general suitability.
Ag. 147.	Red Clover, inoculation.
Ag. 161.	Sweet Clover, variety tests.
Ag. 169.	Sweet Clover, inoculation.
Ag. 201.	Timothy, variety tests for yield and purity.
Ag. 231.	White Dutch Clover, variety tests for yield and suitability.
Ag. 241.	Annual hay crop, variety tests for yield and suitability.
	(*a*) Grain varieties, variety tests for yield and suitability.
	(*b*) Legume varieties, variety tests for yield and suitability.
	(*c*) Other grasses, variety tests for yield and suitability.
Ag. 251.	Millets, variety tests.

CHEMISTRY

C 16.	Distribution of fertilizer in the rotation (Exp. E-21).
C 10.	Sugar beet investigation.
C 11.	Agricultural meteorology.

POULTRY

P 14.	Custom hatching.
P 55.	Methods of handling for egg production.
	Exp. (*a*) Confinement vs. range.
P 56.	Pedigree breeding for egg production.
P 58.	Best hatching date for egg production.
P 62.	Cost of egg production.
	Exp. (*b*) Winter eggs.
	Exp. (*d*) By breeds. (B.R. W.L.)
P 64.	Egg laying contests.
P 65.	R.O.P. (*a*) Egg size, shape and colour.
	(*b*) Winter production, relation of, to fertility, etc.
P 70.	Best type of floor for laying houses.
P 72.	Best type of front for laying houses.
	Exp. (*a*) Roller curtain.
P 73.	Back windows for laying houses.
P 75.	Best kind of litter.
P 76.	Standard (home-mixed) vs. commercial grain.
P 79.	Standard (home-mixed) vs. commercial mashes.
P 89.	Best methods for sprouting oats.
P 91.	Most suitable green feed.
P 107.	Methods of feeding layers.
	Exp. (*a*) Automatic hopper vs. hand feeding.
P 113.	Relation of winter production to fertility and hatchability.
P 120.	Confinement vs. range in breeding.
P 150.	Egg preservatives.
P 152.	Heavy yolk eggs.

APIARY

Ap. 10.	Wintering in single colony cases.
Ap. 20.	Returns from apiaries.
Ap. 22.	Package bees as a means of starting colonies.
Ap. 28.	Study of honey flows.
Ap. 38.	Comparison of different methods for introducing queens.
Ap. 42.	Protected vs. unprotected hives during summer.

FLAX

E 3.	Testing varieties of flax.
E 4.	Testing varieties of hemp.
E 7.	Seeding tests, sowing flax at different dates.