DOMINION OF CANADA

DEPARTMENT OF AGRICULTURE

DOMINION EXPERIMENTAL FARMS

EXPERIMENTAL STATION

STE. ANNE DE LA POCATIÈRE, QUEBEC

REPORT OF THE SUPERINTENDENT

J. A. STE. MARIE, B.S.A.

FOR THE YEAR 1923

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OTTAWA
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PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1924

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EXPERIMENTAL STATION, STE. ANNE DE LA POCATIÈRE, QUEBEC

Report of the Superintendent, J. A. Ste. Marie, B.S.A.

THE SEASON

The winter of 1922-23 was much colder than that of the two previous years, particularly the month of March during which we recorded an average temperature of 21° F. This had the effect of delaying the opening of spring which was long and cold, our first grain being sown on May 5. The cold of late April and early May was followed by a drought which ended in the middle of August.

Owing to the nature of the weather, the seedings on most of the farms of this part of the province were made very late. The growth was light and the harvested grain was of an inferior quality.

Of all the crops affected by the severe drought, the hay suffered the greatest reduction while the roots, corn and sunflowers had to be resown on practically all the fields, for the seed had either rotted in the soil or the plants had been eaten away by the cutworms or destroyed by aphis in the early stage of growth.

The season from August to November was just the reverse of the previous months. We had numerous rains accompanied by warm weather. This brought much improvement in the late crops such as potatoes, corn, roots and pastures. But, on the whole, 1923 will remain the poorest crop year known to the oldest residents in this part of the province.

METEOROLOGICAL RECORDS

From January 1, 1923 to December 31, 1923

Month	Temperature, Farenheit					Precipitation					Hours of sunshine
	Highest	Date	Lowest	Date	Average	Rainfall	Days	Snowfall	Days	Total	
	°		°		°	in.		in.		in.	
January	42·0	1	−16·0	16,29	11·8	0·60	1	9·5	4	1·55	96·13
February	35·0	18	−20·0	4	28·3	.....	.....	6·5	4	0·65	131·12
March	49·5	21	−10·0	28	21·7	.....	.....	35·5	9	3·55	136·13
April	56·0	23	4·0	1	33·3	2·78	5	9·0	4	3·68	203·50
May	75·0	25	52·0	19	55·08	2·67	6	.....	.....	2·67	202·57
June	92·0	19	37·0	16	61·5	1·59	5	.....	.....	1·59	246·13
July	89·0	19	30·0	13	62·9	1·00	4	.....	.....	1·00	245·55
August	84·0	1	38·0	15	60·8	4·03	11	.....	.....	4·03	235·35
September	75·0	5	33·0	16	54·6	2·22	6	.....	.....	2·22	213·15
October	70·0	16	27·0	28	45·7	6·25	7	.....	.....	6·25	159·20
November	55·0	13	13·0	20	34·0	4·41	6	6·0	2	5·01	87·45
December	50·0	14	10·0	31	27·28	0·36	2	6·0	5	0·96	74·15
Totals	.....	.....	.....	.....	.....	25·91	53	72·5	28	33·16	2030·48

ANIMAL HUSBANDRY

HORSES

As mentioned in previous reports, this station is endeavouring to build up a Percheron stud. There are now nine pure-bred females of three years and more of age, one three-year-old stallion, two yearling females and one male, and three 1923 female colts.

Of the four mares bred in 1922, three had colts that were successfully raised.

The following charges were made in computing the tables "Feed consumed by draft horses, etc.", and "Feed consumed by Percheron colts, etc.": Hay, $11 per ton; Bran, $22 per ton; Oats, 51 cents per bushel; Pasture, $2 per month.

FEED CONSUMED BY DRAFT HORSES AND COST OF HORSE LABOUR

Name	Age	Weight	Feed Consumed			Total cost	Hours of work	Cost of work per hour	
			Hay	Oats	Bran				
	years	lbs.	lbs.	lbs.	lbs.	$ cts.		cts.	
Fanchette	5	1,510	5,575	5,786	696	125 10	2,172	5·7	
Jeannette	9	1,593	5,950	5,824	738	128 20	2,241	5·7	
Melina	5	1,642	5,950	5,803	692	127 38	2,413	5·3	
Belle	6	1,635	5,733	5,614	687	123 29	2,112	5·8	
Beatrice	5	1,607	5,722	5,599	696	123 11	1,936	6·3	
Juliette	3	1,632	3,423	3,322	418	73 25	1,285	5·7	For a
Joconde	3	1,585	3,232	3,276	404	71 35	1,416	5·0	period
Mathilda	3	1,564	3,232	3,229	422	70 85	1,248	5·6	of seven months

The amount of feed consumed and the number of hours of work done by each of the horses reported above, have been carefully kept. In estimating the feed consumed at the above quoted price and in working these horses 80 per cent of the total workable hours, horse labour was supplied at an average cost of 5.5 cents per hour.

FEED CONSUMED BY PERCHERON COLTS

From birth to 2½ years

Name	Date of birth	Weight at birth	Weight at 2½ years	Feed consumed			Pasture	Cost of feed
				Hay	Oats	Bran		
		lbs.	lbs.	lbs.	lbs.	lbs.	months	$ cts.
Juliette	Mar. 23, 1920	240	1,600	5,233	3,823	1,448	8	117 99
Joconde	May 10, 1920	234	1,550	4,573	3,496	1,347	9	110 41
Mathilda	June 10, 1920	238	1,525	4,456	3,323	1,332	9	106 99
Mercure	May 9, 1920	245	1,675	6,186	4,898	1,665	4	133 81

In the above table will be noted the amount of hay, oats and bran required to grow a colt up to the age when it can be broken for service. In computing the cost of raising the above colts, at the rates given for the feed consumed, they cost from $107 to $133 for feed only, as the fee of stallion or the time and feed of the mares nursing their colts are not mentioned. These figures would support the claim, that the farmers owning mares which are sound and of draft type, could raise a colt yearly or every other year advantageously, as the supply of draft horses is much below the demand at present.

DAIRY CATTLE

The Ayrshire herd has been much improved during the year, both by the introduction of a few cows of quality, and young heifers sired by "Gardrum Bold Boy" No. 47138, and which are now calving. All the cows that have calved in the fall and spring of the year have been entered in the Record of Performance and it is hoped that, with another year, all the cows will have qualified in this test.

Name of Cows	Date of calving	Number of days in the lactation period.	Total pounds of milk for period.	Daily average yield of milk.	Average per cent fat in milk.	Pounds of butter produced in period.	Value of butter at 35 cents per pound.	Value of skim-milk at 20 cents per cwt.	Total value of products.	Amount of meal eaten at 1·5 cents per pound.	Amount of roots and silage eaten at $4 per ton.	Amount of hay eaten at $11 per ton.	Amount of green feed eaten at $5 per ton.	Amount of straw eaten at $4 per ton.	Months on pasture at $1 per month.	Total cost of feed for period.	Cost to produce 100 pounds of milk.	Cost to produce one pound of butter, skim-milk neglected.	Profit on one pound of butter, skim-milk neglected.	Profit on cow during period, labour and calf neglected.
			lb.	lb.		lb.	$ cts.	$ cts.	$ cts.	lb.	lb.	lb.	lb.	lb.		$ cts.	$ cts.	cts.	cts.	$ cts.
Finette	Mar. 25, 1923	268	10,525	39·2	3·7	461·31	161 46	18 95	180 41	4,120	11,260	1,640	1,890	522	4½	103 60	0 98	22	13	76 81
Lenn. Bluebell 2nd	Dec. 11, 1922	319	8,240	25·8	3·9	381·13	133 40	14 83	148 23	2,925	10,460	1,850	1,340	302	4½	83 42	1 01	22	13	64 81
Mignonne	Feb. 4, 1923	286	6,898	24·1	3·9	316·02	110 61	12 42	123 03	1,980	7,730	1,760	710	362	4½	61 83	0 89	19	16	61 20
Suzette du Lac	April 1923	244	5,817	23·8	3·7	257·41	90 09	10 47	100 56	1,645	6,040	840	600	.....	5	47 87	0 82	19	16	52 69
Alizette du Lac	April 1923	209	5,060	24·2	4·0	240·46	84 16	9 11	93 27	1,625	6,040	870	600	.....	5	47 73	0 94	20	15	45 54
Dahlia	Oct. 13, 1922	372	5,972	16·0	4·1	292·28	102 30	10 75	113 05	1,800	9,262	2,509	1,057	482	6½	69 42	1 16	23	12	43 63
Lenn. Mary 2nd	Sept. 19, 1922	341	5,271	15·4	4·4	261·13	91 40	9 49	100 89	1,490	8,475	2,022	1,318	364	5	59 44	1 13	23	12	41 45
Fadette	June 15, 1922	407	5,404	13·3	3·8	243·91	85 36	9 93	95 29	2,001	8,841	1,732	799	362	7	66 93	1 24	23	12	28 36
Florida	June 5, 1922	291	4,830	16·6	4·4	250·00	87 50	8 69	96 19	1,844	12,120	2,521	1,286	364	4	73 70	1 52	29	06	22 49
Lenn. Doreen 2nd	Sept. 22, 1922	301	3,966	13·1	3·9	195·33	68 37	7 14	75 51	1,316	7,932	2,232	1,242	424	4	55 82	1 40	28	07	19 69
Frivole	Sept. 7, 1922	316	4,009	12·4	3·9	187·12	65 50	7 22	72 72	1,482	7,747	1,733	1,237	362	5	56 06	1 40	30	05	16 66
Florence	June 30, 1922	299	4,552	15·2	3·3	178·90	62 61	8 19	70 80	1,743	10,050	1,990	1,181	424	5	65 98	1 45	36	01	4 82
GRADES																				
Blandine 2nd	Sept. 18, 1922	381	6,273	16·4	4·2	314·06	109 92	11 29	121 21	1,911	10,920	1,904	1,675	484	6	72 14	1 15	23	12	49 07
Caroline	Sept. 23, 1922	320	5,380	16·8	4·3	276·80	96 88	9 68	106 56	1,646	9,210	1,983	1,263	486	5	63 14	1 17	23	12	43 42
Belle	Oct. 14, 1922	330	6,050	18·3	3·5	272·46	95 36	10 89	106 25	2,009	7,285	3,694	4,368	1,278	5½	67 88	1 12	25	10	38 37
Berthe 2nd	Dec. 29, 1922	284	4,538	15·9	4·5	237·74	83 21	8 17	91 38	1,572	7,850	1,850	730	302	5	56 87	1 25	24	11	34 51
Beatrice 2nd	Aug. 1, 1922	261	4,527	17·3	3·9	209·38	73 28	8 15	81 43	1,368	8,305	2,342	392	486	2½	54 46	1 18	26	09	26 97
Diana	June 22, 1922	434	4,891	11·2	3·7	211·48	74 02	8 80	82 82	1,618	8,565	1,480	1,028	486	7	60 08	1 23	28	07	22 74

SILAGE VS OAT HAY VS ROOTS

As very little succulent feed is being grown for the dairy cows in this district, either in the form of roots or corn, with resultant low yields in milk and small returns, two feeding experiments were carried on, to determine if peas and oat hay, or roots could be used advantageously to replace silage.

Twelve milking cows were used for this purpose and were fed during three periods of three weeks each, a ration which had for its basis in the first period, corn silage; second period, peas and oat hay. (In the second experiment, roots took the place of peas and oat hay.) The third period, silage was fed. The two last weeks of each period only, were used for comparison. To compare the value of peas with oat hay or roots with corn silage, the average of the first and third period should be used as comparison with the second period.

The charges for the feed consumed in the experiments are: Silage, $4 per ton; roots, $3 per ton; mixed hay and oat hay, $15 per ton; meal mixture, 1½ cents per pound.

SILAGE VS OAT HAY

	First period	Second period	Third period	Average first and third period
	Silage	Oat hay	Silage	Silage
Number of cows in experiment	12	12	12	12
Pounds of milk produced ... lbs.	3,468·5	3,127·5	2,958·5	3,213·5
Average pounds of milk per cow per day ... "	20·7	18·6	27·6	19·1
Total pounds of oat hay consumed ... "	.....	1,867	.....	1,867
Total pounds of silage consumed ... "	5,600	.....	5,600	5,600
Total pounds of hay consumed ... "	1,778	1,650	1,778	1,778
Total pounds of meal consumed ... "	991	893	845	918
Pounds of silage consumed ... per 100 lbs. milk	161·45	.....	189·28	175·36
Pounds of oat hay consumed ... "	.....	72·5	.....	.....
Pounds of meal consumed ... "	28·5	28·5	28·5	28·5
Cost of silage consumed ... $	11·20	.....	11·20	11·20
Cost of oat hay consumed ... $	.....	14·00	.....	.....
Cost of hay consumed ... $	13·31	12·37	13·33	13·33
Cost of meal consumed ... $	14·87	13·40	12·68	13·77
Total cost of feed ... $	39·40	39·77	37·21	38·30
Cost of feed to produce 100 lbs. milk ... $	1·13	1·27	1·25	1·19

From this year's experiment it was not found possible to produce milk quite as economically with oat hay as with silage, nor was it possible to maintain as good a milk production. However, in feeding oat hay as a substitute for silage, it proved possible to produce milk with a difference of eight cents only, per hundredweight, and as there are scores of farmers in this valley who have no silo, it would be worth while trying this crop as a palatable feed. It is easy to grow and cure and all classes of cattle relish it.

SILAGE VS ROOTS

	First period	Second period	Third period	Average first and third period
	Silage	Roots	Silage	Silage
Number of cows in experiment	12	12	12	12
Pounds of milk produced lbs.	2,958·5	2,765·5	2,376·5	2,667·5
Average pounds of milk per cow per day "	17·6	16·4	14·1	15·8
Total pounds of roots consumed "	.....	6,160	.....	.....
Total pounds of silage consumed "	5,600	.....	5,600	5,600
Total pounds of hay consumed "	1,778	1,778	1,778	1,778
Total pounds of meal consumed "	845	1,014	679	762
Pounds of silage consumed per 100 lbs. milk	189·28	.....	235·64	212·46
Pounds of roots consumed "	.....	193·9	.....	.....
Pounds of meal consumed "	28·5	28·5	28·5	28·5
Cost of silage consumed $	11·20	.....	11·20	11·20
Cost of roots consumed $	.....	9·24	.....	.....
Cost of hay consumed $	13·33	13·33	13·33	13·33
Cost of meal consumed $	12·68	15·21	10·18	11·43
Total cost of feed $	37·21	37·78	34·71	35·96
Cost of feed to produce 100 lbs. milk $	1·25	1·37	1·46	1·35½

As will be noticed in the third period of this test, a pronounced milk decrease was registered. This may be attributed in part to the fact that many of the cows were nearing the end of their lactation period, hence the reader should keep this in mind in interpreting the results. The experiment was not to determine if roots were more advantageous than silage, but primarily to find out if roots could be used in the ration of milking cows where silage was not available.

SWINE

This report shows a fairly successful year with the swine division. Of the ten sows kept, nine gave birth to a total of eighty-eight young pigs, of which seventy-six were raised. This makes an average of 8.4 pigs per sow, raised to six weeks of age. Of this number, eighteen (mostly young boars) were sold for breeding and the balance raised and sold for pork. Six of the older sows were also sold and replaced by young ones.

Owing to the prevailing high cost of feed throughout the year, and the relatively low price of pork, profit in pork production can only be made possible by keeping sows of the right type, and by feeding and selling the stock very judiciously.

HAND-FEEDING VS SELF-FEEDING

1. To determine the respective value of these two systems of feeding.
2. To determine which of these methods is most economical in finishing pork.

A group of eight pigs was divided in two lots which were fed cornmeal and middlings by the methods of hand-feeding and self-feeding.

Prices charged for feeds: cornmeal, $27.86 per ton; middlings, $30.50 per ton.

Meal mixture: 1 part of cornmeal and 1 part of middlings.

HAND-FEEDING AND SELF FEEDING

——		Lot No. 1 hand-fed	Lot No. 2 self-fed
Number of hogs in experiment		4	4
Initial weight gross	lbs.	549	552
Initial weight average	"	137·2	138
Finished weight gross	"	741	670
Finished weight average	"	185·2	167·5
Number of days in experiment	days	75	75
Total gain for period	lbs.	192	118
Average gain per animal	"	48	29·5
Quantity of meal eaten by group	"	924	890
Total cost of feed	$	14·60	14·11
Cost of feed per head	$	3·65	5·53
Cost of feed to produce 1 pound gain	$	0·076	0·12
Pounds of meal per pound of gain	lbs.	4·81	7·5

In the above experiment, the hogs were divided as equally as possible as to age, appearance of thrift and weight. It will be noted that 4.8 pounds of meal were required to produce one pound of gain in lot No. 1, which was hand-fed, and 7.5 pounds for lot No. 2 which was self-fed, a difference of 2.7 pounds in favour of the hand-fed lot.

MILK POWDER VS SKIM MILK

(Experiment Conducted in Winter)

To determine the relative value of commercial powdered milk for feeding pigs.

Two lots of Yorkshire pigs, five for each lot, were fed the following ration: cornmeal, middlings, shorts, oatmeal, (equal parts) and roots. Lot No. 1 was fed milk powder; Lot No. 2 skim-milk.

Prices charged for feeds: cornmeal, $27.86 per ton; middlings, $30.50 per ton; shorts, $23.50 per ton; oatmeal, $28 per ton; milk powder, 15 cents per pound; skim-milk, 20 cents per hundredweight; roots, $3 per ton; green feed, $5 per ton.

Meal mixture: 1 part cornmeal, 1 part middlings, 1 part shorts and 1 part oatmeal.

MILK POWDER AND SKIM-MILK—WINTER TEST

——		Lot No. 1 milk powder	Lot No. 2 skim-milk
Number of hogs in experiment		5	5
Initial weight gross	lbs.	374	375
Initial weight average	"	74·8	75
Finished weight gross	"	950	1,020
Finished weight average	"	190	204
Number of days in experiment	days	114	114
Total gain for period	lbs.	576	645
Average gain per animal	"	115·2	129
Quantity of meal eaten by group	"	1,580	1,540
Quantity of roots eaten by group	"	1,325	1,325
Quantity of milk powder and skim-milk eaten	"	188	4,620
Total cost of feed	$	51·82	32·29
Cost of feed to produce 1 pound grain	$	0·09	0·05

MILK POWDER VS SKIM-MILK

(Experiment Conducted in Summer)

A similar experiment was carried in the summer. The two lots were of six pigs each and the roots were replaced by green feed.

MILK POWDER AND SKIM-MILK—SUMMER TEST

		Lot No. 1 milk powder	Lot No. 2 skim-milk
Number of hogs in experiment		6	6
Initial weight gross	lbs.	141	135
Initial weight average	"	23·5	22·6
Finished weight gross	"	1,093	1,049
Finished weight average	"	182·1	174·8
Number of days in experiment	days	134	134
Total gain for period	lbs.	952	914
Average gain per animal	"	158·7	152·3
Quantity of meal eaten by group	"	2,128	2,152
Quantity of green feed eaten by group	"	1,206	1,206
Quantity of milk powder and skim-milk eaten	"	212	6,456
Total cost of feed	$	63·95	45·39
Cost of feed to produce 1 pound gain	$	0·066	0·049

The cost of producing one pound gain of pork was higher in both experiments with lot No. 1 which was fed with milk powder, this cost being 4 cents higher in the first experiment and 1.8 cent in the second experiment. This would indicate that unless milk powder can be obtained for much less than 15 cents per pound, its feeding could only be found advantageous as a substitute for skim-milk when the latter is not available.

COST OF MAINTENANCE OF NINE SOWS FOR ONE YEAR AND OF RAISING YOUNG PIGS TO SIX WEEKS OF AGE

Number of sows		9
19,710 pounds of meal eaten at 1·3 cents per pound	$	256 23
7,884 pounds of roots eaten at $3 per ton	$	11 82
4,927½ pounds of green feed eaten at $5 per ton	$	12 31
1,314 pounds of milk at 20 cents per hundredweight	$	2 63
Total cost of feed	$	282 99
Cost of feed per head	$	31 44
Cost of feed per head per day	$	0·09
Pounds of meal eaten per head per day	lb.	6
Pounds of roots eaten per head per day	lb.	2·4
Pounds of green feed eaten per head per day	lb.	1·5
Average number of pigs per litter		9·8
Average number of pigs raised		8·4
Average cost at six weeks	$	3 69
Value at six weeks	$	6 00
Average profit per pig raised, over feed cost	$	2 31
Average profit per sow	$	19 40
Total profit over cost of feed	$	174 60

As reported above, the average cost of keeping a sow for one year was $31.44, and an average of $3.69 to raise young pigs to six weeks of age. The sows included in the above group were sows of one, two, three, four and six years of age.

The sows were kept, excepting for the period they were nursing their young pigs, in small colony houses placed in small paddocks, where they could obtain plenty of exercise, summer and winter. In the summer and fall, green feed and roots were added to their meal ration, and clover hay was placed at their disposal in winter.

From the above statement, it would seem a safe policy for the average farmer to keep one or two mature brood sows and raise strong young pigs, instead of buying pigs, which are often reared from immature sows, at a price much higher than they could have been raised at home.

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COST OF MAINTENANCE OF A BOAR FOR ONE YEAR

300 pounds of shorts eaten at 1·2 cents per pound	$	3 60
340 pounds of bran eaten at 1·1 cent per pound	$	3 74
200 pounds of middlings eaten at 1·5 cents per pound	$	3 00
200 pounds of screenings eaten at 1·2 cents per pound	$	2 40
180 pounds of cornmeal eaten at 1·4 cents per pound	$	2 52
146 pounds of ground oats eaten at 1·4 cents per pound	$	2 04
464 pounds of roots eaten at $3 per ton	$	0 69
390 pounds of green feed eaten at $5 per ton	$	0 97
Total cost of feed	$	18 96
Cost of feed per day	$	0·052
Pounds of meal eaten per day	lb.	3·74
Pounds of root eaten per day	lb.	1·27
Pounds of green feed eaten per day	lb.	1·06

The above statement indicates that the cost of keeping a boar under the best conditions is relatively low and no district where sows are kept should be without a boar of quality.

FINANCIAL STATEMENT—SWINE

Initial Investment:		
6 brood sows at $50	$	300 00
6 brood sows at $40		240 00
1 pure-bred boar		100 00
1 piggery, 6 cabins and land		2,500 00
Working equipment		50 00
Total	$	3,190 00
DR.:		
55,266 pounds of meal at 1·3 cents per pound	$	718 46
9,485 pounds of milk at 20 cents per cwt		18 97
10,094 pounds of roots at $3 per ton		15 14
6,990 pounds of green feed at $5 per ton		17 47
6 tons of straw at $8 per ton		48 00
Interest on investment at 6 per cent		191 40
1,200 hours of work at 30 cents		360 00
6 cords of fuel at $7 per cord		42 00
	$	1,411 44
To balance		81 45
	$	1,492 89
CR.: (By sale of)		
18 registered sows and boars at $10	$	180 00
2,425 pounds (live weight) heavy pork at 7 cents		169 75
1,535 pounds " pork at 10 cents		153 50
1,056 pounds dressed pork at 10·3 cents		108 76
438 pounds " 10·5 cents		45 98
1,720 pounds " 10·9 cents		187 48
199 pounds (live weight) pork at 12 cents		23 88
728 pounds dressed pork at 14·7 cents		107 01
202 pounds " 14 cents		28 28
773 pounds " 15 cents		115 95
122 pounds (live weight) pork at 15 cents		18 30
1 hog at $15		15 00
2 hogs at $16 each		32 00
8 hogs at $22 each		176 00
1 hog at $31		31 00
Increase of stock		100 00
		1,492 89

SHEEP

The flock of Leicester sheep continued to improve during the year and the introduction of an imported ram in the fall should enable the supplying of breeding stock of a very high quality to local breeders in the fall of 1924.

The flock is now composed of: one imported Leicester ram, one Shropshire ram, twenty-five pure-bred sheep, ten pure-bred ewe lambs (not bred), fifteen commercial ewes (for experimental purposes).

CROSS-BRED VS PURE-BRED LAMBS

To determine if there would be any advantage in crossing, to produce lambs for the market, this experiment was started in the fall of 1922.

Thirty pure-bred Leicester ewes were divided into two groups of fifteen each. Group No. 1 was bred to a pure-bred Leicester ram and group No. 2 to a pure-bred Shropshire ram.

CROSS-BRED LAMBS FOR MARKET

	Group No. 1	Group No. 2
Number of ewes	15	15
Number of lambs raised	14	13
Weight of lot at birth	113·9 lb.	105·6 lb.
Average weight per head at birth	8·1 "	8·1 "
Weight of lot at six months of age	1,026·9 "	1,068 "
Increase of lot in six months	913 "	962·4 "
Increase per head in six months	65·2 "	74·03 "

As it will be noted from the table, the cross-bred lambs at six months of age weighed an average of 9·01 pounds more than the pure-bred lambs, but the number of lambs raised was slightly in favour of the pure-bred group. This year's experiment would indicate a slight advantage in favour of crossing pure-bred Leicesters to a Shropshire ram, to produce lambs for the market. This work will be continued and followed closely for a few years.

COST OF MAINTENANCE OF A FLOCK

Number of sheep and ewe lambs		51
Number of rams		2
32,687 pounds of hay at $12 per ton	$	196 12
5,900 pounds of oats at 1·5 cents per pound		88 50
5,900 pounds of bran at 1·1 cent per pound		64 92
Pasture, 53 head at 40 cents per head		21 20
Total cost	$	370 74
Cost per head		6 99

It will be noted that the cost of maintenance per head amounted to $6.99, which may be considered fairly high. This cost is mainly brought about by the very poor pastures available for the sheep and the long extended drought that prevailed in 1923, which necessitated the feeding of a larger portion of concentrates than would have been necessary in a normal year with better pastures.

FINANCIAL STATEMENT—SHEEP

Initial Investment:—		
25 pure-bred ewes at $20	$	500 00
12 ewe lambs at $15		180 00
15 commercial ewes at $10		150 00
1 pure-bred Leicester ram		75 00
1 pure-bred Shropshire ram		35 00
1 sheep barn		1,500 00
Total	$	2,440 00
DR.:		
32,687 pounds of hay at $12 per ton	$	196 12
5,900 pounds of meal at 1·1 cent per pound		64 90
5,900 pounds of oats at 1·5 cents per pound		88 50
Pasture, 56 head at 40 cents per head		22 40
Interest on investment at 6 per cent		146 40
800 hours of work at 30 cents per hour		240 00
	$	758 32

FINANCIAL STATMENT—SHEEP—*Continued.*

CR.: (by sale of)		
1 old ram	$	30 00
5 lambs for breeding at $15 each		75 00
21 lambs at $6.25 (mutton)		131 25
380 pounds of wool at 30 cents per pound		114 00
9 old ewes at $5		45 00
50 tons of manure at $1		50 00
Increase of stock, 4 lambs at $15		60 00
	$	505 25
To balance		253 07
	$	758 32

FIELD HUSBANDRY

ROTATIONS

Experimental work is carried with three-year, four-year and five-year rotations. Very careful figures and observations are kept, of all the crops grown.

In order that the reader may better understand the tables of this report, the "Cost Factors and Return Values" used are here given:—

Cost Factors:—

Rent of land (including taxes), $125 per acre at 6 per cent.
Manure, $1 per ton (for spreading only).
Use of machinery, $3 per acre.
Manual labour, 26 cents per hour.
Horse labour, 12 cents per horse.
Threshing, 10 cents per bushel.
Ensiling, 26 cents per ton.
Gasoline, 35 cents per gallon.
Twine, 35 cents per pound.
Seed:
- Corn, $1.70 per bushel.
- Sunflowers, 12 cents per pound.
- Turnips, 85 cents per pound.
- Clover, 30 cents per pound.
- Timothy, 15 cents per pound.

Return Values:

Clover hay, $15 per ton.
Timothy hay, $18 per ton.
Swede turnips, $3 per ton.
Silage, (80 per cent green weight) $6 per ton.
Wheat, $1.70 per bushel..

COST AND YIELD OF ONE ACRE OF CORN, THE FIRST CROP OF A FOUR-YEAR ROTATION. (DRAINED).

Area	acre	1
Rent of land, $125 per acre at 6 per cent	$	7 50
Use of machinery, $3 per acre		3 00
Manure, 20 tons per acre, 40 per cent at $1 per ton		8 00
Ploughing, 8 hours, 1 man and 2 horses at 50 cents per hour		4 00
Harrowing, 6 hours 1 man and 2 horses at 50 cents per hour		3 00
Rolling, ½ hour, 1 man and 2 horses at 50 cents per hour		0 25
Seeding, 1½ hours, 1 man and 2 horses, at 50 cents per hour		0 62
Seed, 42 pounds at 3 cents per pound		1 26
Thinning, 8 hours, 1 man, at 26 cents per hour		2 08
Hoeing, 5 hours, 1 man at 26 cents per hour		1 30
Cultivating, 1½ hours, 1 man and 1 horse at 38 cents per hour		0 57
Cultivating, 3 hours, 1 man and 2 horses at 50 cents per hour		1 50
Cutting, 10 hours, 1 man at 26 cents per hour		2 60
Hauling, 8 hours, 1 man and 2 horses at 50 cents per hour		4 00
Ensiling, 23,025 pounds at 26 cents per ton		2 99
Gasoline used, 5·7 gallons at 35 cents per gallon		1 99
Cost per acre	$	44 66
Yield per acre	lb.	23,025
Cost per ton	$	3 86
Profit per acre	$	24 61

Owing to the very dry, cold weather of 1923, a yield slightly over 11½ tons per acre was obtained at a cost of $3.86 per ton. A yield of over 11 tons, in a bad year, can be called satisfactory and worth while, if compared with the yield and selling price of other crops for this district.

Corn is a fairly delicate crop to grow in this district and on account of the repeated dry summers that are apt to prevail here, it would be well to manure and plough the heavy land in the fall and to make sure of thorough tillage before sowing in the spring. It is also well to repeat cultivation frequently during the summer.

The yield of one acre of sunflowers, the first crop of a four-year drained rotation, was 14,775 pounds. The yield obtained was exceedingly small, and the factors responsible for this low yield were the cold, dry spring, which caused a poor germination and a slow start; cut-worms, which made the stand very thin, and the severe drought which checked the growth of the crops. A large field was sown with sunflowers at a later date. The germination and yield were much higher and the crop practically escaped the cut-worm attack which damaged the one-acre field.

COST AND YIELD OF ONE ACRE OF SWEDE TURNIPS, THE FIRST CROP OF A FOUR-YEAR ROTATION. (DRAINED)

Area	acre	1
Rent of land, $125 per acre at 6 per cent	$	7 50
Use of machinery, $3 per acre		3 00
Manure, 20 tons per acre, 40 per cent at $1 per ton		8 00
Ploughing, 8 hours, 1 man and 2 horses at 50 cents per hour		4 00
Harrowing, 6 hours, 1 man and 2 horses at 50 cents per hour		3 00
Rolling, ½ hour, 1 man and 2 horses at 50 cents per hour		0 25
Seeding, 2½ hours, 1 man at 26 cents per hour		0 65
Seed, 2 pounds at 85 cents per pound		1 70
Thinning, 12 hours, 1 man at 26 cents per hour		3 12
Hoeing, 30 hours, 1 man at 26 cents per hour		7 80
Cultivating, 6 hours, 1 man and 1 horse at 38 cents per hour		2 28
Pulling, 15 hours, 1 man at 26 cents per hour		3 90
Hauling, 20 hours, 1 man and 2 horses at 50 cents per hour		10 20
Cost per acre	$	55 40
Yield per acre	lb.	37,375
Cost per ton	$	2 96
Profit per acre	$	0 75

The dry, cold spring made root growing difficult, as the field had to be sown twice and the growth was very slow. With the middle of August, came rain, and much late growth was made with the result that a fair crop was obtained. On the average of years, swede turnips will do better on light to gravelly loam than on clay soils.

COST AND YIELD OF ONE ACRE OF HURON WHEAT, THE SECOND CROP OF A FOUR-YEAR ROTATION. (DRAINED)

Area	acre	1
Rent of land, $125 per acre at 6 per cent	$	7 50
Use of machinery, $3 per acre		3 00
Manure, 20 tons per acre, 30 per cent at $1 per ton		6 00
Ploughing, 8 hours, 1 man and 2 horses at 50 cents per hour		4 00
Harrowing, 6 hours, 1 man and 2 horses at 50 cents per hour		3 00
Seeding, 1½ hours, 1 man and 2 horses at 50 cents per hour		0 62
Seed, 1½ bushel at $2 per bushel		3 00
Reaping, 1½ hours, 1 man and 2 horses at 50 cents per hour		0 62
Stooking, 1½ hours, 1 man at 26 cent per hour		0 39
Twine, 3 pounds at 15 cents per pound		0 45
Hauling, 2 hours, 1 man and 2 horses at 50 cents per hour		1 00
Hauling, 2 hours, 1 man at 26 cents per hour		0 52
Threshing, 36·95 bushels at 10 cents per bushel		3 69
Cost per acre	$	34 04
Yield per acre	bush.	36·95
Cost per bush	$	0 92
Profit per acre		28 82

Of all the crops grown, wheat was the most satisfactory this year. As reported above, a very fair yield was obtained in 1923, and for the last three years an average of slightly over 36 bushels. The soil and climate of this district seem to be most favourable to the growing of wheat of quality and it would be worth the attention of the farmers of this valley to make it a seed-growing centre for Huron wheat.

COST AND YIELD OF ONE ACRE OF TIMOTHY, THE FOURTH CROP OF A FOUR-YEAR ROTATION. (DRAINED)

Area	acre	1
Rent of land, $125 per acre at 6 per cent	$	7 50
Use of Machinery, $3 per acre		3 00
Manure, 20 tons per acre, 10 per cent at $1 per ton		2 00
Seed		1 83
Mowing, 1 hour, 1 man and 2 horses at 50 cents per hour		0 50
Raking, ½ hour, 1 man and 1 horse at 38 cents per hour		0 19
Coiling, 1½ hour, 1 man at 26 cents per hour		0 39
Hauling and storing, 2·6 hours, 1 man and 2 horses at 50 cents		1 30
Loading, 2·6 hours, 1 man at 26 cents per hour		0 68
Cost per acre	$	17 39
Yield per acre	lb.	2,950
Cost per ton	$	13 12
Profit per acre		6 46

Owing to the dry summer of 1922, the catch of the grass seed mixture was very poor. As the year 1922 was followed by another dry summer, the small crop of timothy obtained is thus explained.

DRAINED VS. UNDRAINED ROTATION

Crop	Yields	
	Drained	Undrained
	lbs.	lbs.
Corn, first year	23,025	*8,550
Sunflowers, first year	*14,775	40,725
Swede turnips, first year	37,375	30,225
Wheat, second year	2,217	1,959
Clover, third year	2,605	2,900
Timothy, fourth year	2,650	2,500

*Owing to the extreme drought, these fields had to be resown. The yields, therefore, cannot be taken as representative of drained and undrained land.

The very small yields of practically all the crops were due to the most unfavourable weather conditions prevailing in Eastern Quebec in 1923.

HORTICULTURE

ORCHARD

APPLE TREES

Despite the cold winter, the apple trees wintered in a very good condition. The only variety seriously affected was the Milwaukee, of which six trees were lost out of twelve, with the six others more or less injured. Of the remaining nine-hundred and seven trees, only three were lost through the year.

The growth of the trees was light during the early part of the summer, but as the season was wet from August 11, much growth took place in the fall and the trees went into the winter in a very sappy condition.

Owing to the heavy bloom and crop of apples of the previous year, only a few trees came into bloom in the spring and practically no apples were harvested, but the trees went into the winter heavily covered with fruit buds.

The orchard was given three lime sulphur sprays with lead arsenate used as an insecticide. But whether it was due to the dry summer or to some other causes, the insects were not troublesome this year

Cultural Experiment.—The section of our orchard planted in 1913 was subdivided into three parts four years ago and each section receives a different treatment. On one part, the hay is cut in the middle of June and is left on the ground as cut. On the second part, the hay is cut on the same day as section one and is placed around the foot of the trees. The third part is ploughed in early spring, harrowed several times and in July is sown with rape, which uses by its growth the surplus moisture and serves as a cover crop.

It is yet too early to draw any conclusion, as many of the varieties have not come into bearing yet. However, one can already observe that the trees are making better growth in the part where a mulch is maintained until July and then sown to rape. This section is followed by part two, where the hay is gathered around the foot of the trees.

CHERRIES

As with the apple trees, the bloom was light and from twelve to fourteen days later than last year. The date of blooming of the two most satisfactory varieties was: Early Richmond, June 8; Cerise de France, June 9.

PLUMS

In our plum orchard, the variety Washington was lost and the Lombard slightly affected by the winter. The crop was only medium in 1923. The date of blooming this year was about twelve days later than last.

The recommended varieties are: Damson, Reine Claude, Lombard.

BUSH FRUITS

Gooseberries.—Four varieties were planted in 1922 and did fairly well in 1923. Only a few bushes bore fruit this year.

Raspberries.—Twelve varieties were planted in 1922. The growth of the bushes was fair, but the fruit crop suffered from lack of moisture. The highest-yielding varieties are:—

Newman Seedling 23,	which yielded	1,413	pounds per acre
Latham,	"	1,331	"
Sir John,	"	1,270	"
Superlative,	"	847	"

Currants.—Of the different varieties of red, white, and black currants, planted in 1922, practically no crop was harvested.

FLOWERS

Annuals.—The date that most flowers came into bloom, owing to the cold spring and dry summer, was about thirty days later than the average of several years past. Growth was exceedingly poor and many varieties failed altogether. The varieties that stood the drought best were: Sweet Alyssum, Little Dorrit; Candytuft, White Spiral; Clarkia Elegans; California Poppy; Linum Grandiflorum; Mathiola Bicornis; Nasturtium; Mignonette; Portulaca; Pansy, Nicotiana Affinis.

Asters.—Sixteen varieties were sown in hotbeds on April 25. The plants were set in the open on June 8 and did fairly well despite the severe drought.

Asters are easy of cultivation, hardy, and last until the heavy frosts. We recommend the following of the Crego variety: white, shell pink, rose, purple and lavender and of the red varieties, the Heart of France.

Tulips.—Tulips are easy of cultivation, are the first flowers in bloom in the spring and are always much admired. Twenty-two varieties were cultivated this year and the growth was good. The variety "Couronne d'Or" was in bloom on May 29. The recommended varieties are: Arthur, Duchesse de Parma, Couronne d'Or, La Merveille, Picotee, Gesneriana, Spathulata, Edmee, Bartigon, Isis, Lutea Major, Cramoisie Brillante, Murillo.

In the fall of 1922, five varieties of tulips from Sidney, B.C., were planted for comparison with the same varieties from Holland. The Sidney varieties have given us as good results as those received from Holland.

SHRUBS

As a beginning in the beautification of the Farm grounds, the following varieties of shrubs were planted in the fall of 1923:

25 Lilacs (Varieties of Syringa vulgaris),
8 Syringa Villosa,
19 Japanese Barberry,
16 Spriraea Van Houttei,
15 Tartarian Honeysuckle,
4 Viburnum Lantana,
9 Hydrangea Paniculata Grandiflora,
1 Philadelphus Speciosissimus Grandiflorus,
15 Rosa Rugosa.

VEGETABLES

Like the other crops, the vegetables were affected by the cold, late spring and the severe drought of the summer of 1923. Some varieties or species suffered more than others and are not reported. The extreme weather conditions should be borne in mind in the interpretation of the results from the projects reported.

BEANS, VARIETY EXPERIMENT

Twenty-one varieties were under observation, twelve from seed grown at the Central Experimental Farm and nine from commercial sources.

No clear-cut comparison can be made, owing to the fact that some of the varieties did not germinate well and others were attacked by cut-worms. The yield of the varieties having given the best results, for a 30-foot row, 30 inches apart, is as follows:—

Home-Grown Seed (Central Experimental Farm):	
Hodson Long Pod	10¾ gallons
Early Valentine	8 "
Masterpiece	7 "
Round Pod Kidney	7 "
Commercial Sources:	
Hodson Long Pod	8½ "
Early Valentine	3¾ "
Masterpiece	2½ "
Round Pod Kidney	4 "

BEETS, VARIETY EXPERIMENT

Seven varieties were sown, but growth was poor. The highest yields were obtained with the following varieties: Half Long, Blood, Detroit Dark Red, Eclipse and Early Wonder.

CABBAGE, VARIETY EXPERIMENT

Of the thirteen varieties under test, the Copenhagen Market is recommended for early use and the Danish Ballhead for the winter.

CARROTS, VARIETY EXPERIMENT

Five varieties were tried and gave medium results. The Chantenay has given the highest yield and is also preferred on account of its smoothness. The yields for a 30-foot row, 30 inches apart follow:—

Chantenay	40 lbs.
Danvers Half Long	41 "
Golden Ball	40 "
Ox Heart	32 "
Amsterdam	28 "

The Ox Heart variety is the earliest of all.

CELERY, VARIETY EXPERIMENT

Ten varieties were under test. Of these the varieties Golden Self Blanching and White Plume gave the best results this year. The White Plume is an early variety. The weight of three average plants was:—

Golden Self Blanching	4½ lbs.
White Plume	2¼ "

CELERY, BLANCHING EXPERIMENT

Two methods of growing and blanching celery were tried. One block 6 feet by 6 feet was set out with plants 6 inches apart. The plot was earthed as it grew. Celery was also planted in a row, 6 inches between plants and boards were used for blanching. While the block system may be preferred for the growing of celery on a commercial scale, the board system for blanching is recommended for small gardens.

CORN, SUCKERING EXPERIMENT

The object of this experiment was to determine whether the period of maturity could be advanced and the ears become more even by allowing the main stalk only of the corn to grow. The secondary shoots were all removed. The corn was sown in hills three feet apart each way with three plants to the hill. Of sixty hills planted, thirty had the secondary shoots removed. The Early Malcolm and Golden Bantam varieties were used.

As will be noticed in the table following, the removing of the secondary shoots has advanced the period of maturity, eight days in the case of the Early Malcolm and one day for the Golden Bantam, and has also increased materially the number of marketable ears.

Name of Variety	Ready for use	Marketable ears	Total ears
(Without shoots)—			
Early Malcolm	Aug. 20	130	150
Golden Bantam	Sept. 12	103	136
(With shoots)—			
Early Malcolm	Aug. 28	96	114
Golden Bantam	Sept. 13	90	137

CORN, VARIETY EXPERIMENT

The twelve varieties tested were sown in hills three feet apart each way, thirty hills for each variety. The Pickaninny variety which matured the earliest is a black corn of very short ears. The Early Adams and Early Malcolm are good early varieties, while Golden Bantam is recommended as a late one.

LETTUCE, VARIETY EXPERIMENT

Of the varieties tested, the Grand Rapids and Black Seeded Simpson are recommended as non-head-forming varieties. Of the head-forming varieties, the Hanson is a very good one.

ONIONS, VARIETY EXPERIMENT

Sixteen varieties were sown in 30-foot rows, 15 inches between the plants. Owing to the bad weather conditions, many varieties did not mature well. The following varieties have given the best yields for the year:—

Ailsa Craig	60 lbs.
Large Red Wethersfield (Ottawa)	59 "
Southport White	56 "
Extra Early Flat Red	51 "
Silver King Mammoth	51 "
Giant Prize Taker	50 "
Yellow Globe Danvers (Ottawa)	50 "

PARSNIPS, VARIETY EXPERIMENT

The Hollow Crown variety has given the best results.

PEAS, VARIETY EXPERIMENT

Of the twenty-one varieties tested, in rows 30 feet long and 30 inches between the rows, those that have given the best results this year are:—

Early varieties: Alaska, Eight Weeks.
Medium varieties: Early Morn, Thomas Laxton.
Late varieties: Potlach, Stratagem.

TOMATOES, METHOD OF TRAINING

The variety Alacrity was started in hotbeds and later planted in the garden, in rows 24 inches apart and 12 inches between plants. Twenty-five plants were trimmed to a single stem not headed back; twenty-five plants with single stem stopped at the third truss of fruit; twenty-five plants with single stem stopped at the second truss of fruit; and twenty-five plants with single stem stopped at the first truss of fruits.

It will be noted that the maturity of the fruit is advanced materially by limiting the number of fruit-bearing trusses. This has, however, affected the yield of each plant. The prevailing drought of 1923 also affected the yield. The date of maturity and yield of twelve plants follow:—

TRAINING TOMATOES

Name of Variety	Pruned to	Ready for use	Yield of Ripe Tomatoes	Yield of Green Tomatoes	Total Yield
			lbs.	lbs.	lbs.
Alacrity	One stem	Aug. 11	20½	35	55½
"	One stem and one cluster	" 13	11	10	21
"	One stem and two clusters	" 17	15½	20	35½
"	One stem and three clusters	" 17	22½	25	47½

TOMATOES VARIETY EXPERIMENT

Twenty-two varieties were started in hotbeds on March 28 and planted in the garden on June 7. Twenty-five plants of each variety were set out, 30 inches apart in the rows and 24 inches between the plants.

Owing to the severe drought, the yield is below the average. The Danish Export variety is the only one that was not affected by the dry rot. The varieties having given the best results for the year, are:—

Danish Export (Ste. Anne)	50 lbs.
Red Canner	67½ "
Bonny Best (Stokes)	67 "
Bonny Best (Keith)	66 "
Early Mascot	60½ "
Pierrette	58 "
Earliest of All	56 "
John Baer	54½ "

POTATOES, SPROUTED VS UNSPROUTED FOR EARLINESS

A certain quantity of seed potatoes of the Irish Cobbler and Green Mountain varieties was exposed for a period of six weeks in subdued light at a temperature varying from 40° to 50° F. The sets were planted 14 inches apart and 30 inches between the rows. An equal number of sets, kept in the dormant stage as much as possible were planted at the same distances.

A higher yield was obtained with the unsprouted Irish Cobbler potatoes and the reverse with the Green Mountain variety. This is accounted for by the severe drought which was followed by plentiful rainfall in August. The Irish Cobblers were ripe when the rains came, while the Green Mountains, which were sprouted, kept growing at a much later date.

POTATOES, VARIETY EXPERIMENT

For this purpose, typical tubers of each variety are selected each year and are planted in rows 66 feet long, 30 inches apart with 14 inches between plants in the rows.

POTATO VARIETY EXPERIMENT

Name of Variety	Large	Small	Yield per acre
	lbs.	lbs.	bush.
Green Mountain	112	15	668·48
Gold Coin	112	12	545·36
Rochester Rose	80	21	444·24
Early Rose	55	23	326·32
Irish Cobbler	52	22	325·36

POTATOES, DIFFERENT DATES OF SEEDING TO OBTAIN THE BEST YIELD

Two varieties of potatoes, namely the Irish Cobbler and the Green Mountain, were planted in rows 66 feet long with 12 inches between the plants, at intervals of eleven days, to determine the influence of this on yields, as well as its effect on their reproductive ability. A proportion of each planting has been retained for this test another year.

The results of the first year's work show that the early-sown potatoes have given us the highest yields.

COST OF GROWING POTATOES

The cost of the cultivating operations in connection with the growing of one acre of each of two varieties of potatoes, one early and one late, was kept throughout the season and an itemized statement of cost and production is given below.

It will be noted that the lower yield and the higher cost per bushel of the Irish Cobbler may be explained by the severe drought which lasted to the middle of August. As the Irish Cobbler is maturing much earlier than the Green Mountain variety, its growth was finished when rain came in the middle of August, while the Green Mountain kept growing until the last days of September and thereby benefited from the moisture.

Unless potatoes are grown for the early market, this factor in favour of the Green Mountain variety should be kept in mind when choosing and growing a variety of potatoes for the fall and winter market.

COST OF GROWING POTATOES

—	Green Mountains	Irish Cobblers
Area	1 acre	1 acre
Rent of land, $125 per acre at 6 per cent	$ 7 50	$ 7 50
Use of machinery, $3 per acre	3 00	3 00
Manure, 20 tons per acre, 40 per cent at $1 per ton	8 00	8 00
Ploughing, 8 hours, 1 man and 2 horses at 50 cents per hour	4 00	4 00
Harrowing, 6 hours, 1 man and 2 horses at 50 cents per hour	3 00	3 00
Rolling ½ hours, 1 man and 2 horses at 50 cents per hour	0 25	0 25
Seeding, 20 bushels at 50 cents per bushel	10 00	10 00
Cutting, 8 hours, 1 man at 26 cents per hour	2 08	2 08
Planting, 7 hours, 2 men and 2 horses at 76 cents per hour	5 32	5 32
Cultivating, 2 hours, 1 man and 1 horse at 38 cents per hour	0 76	0 76
Cultivating, 3 hours, 1 man and 2 horses at 50 cents per hour	1 50	1 50
Hoeing, 15 hours, 1 man at 26 cents per hour	3 90	3 90
Hilling up, 2 hours, 1 man and 2 horses at 50 cents per hour	1 00	1 00
Spraying, 4 hours, 2 men and 1 horse at 64 cents per hour	2 56	2 56
Spraying material	5 54	5 54
Digging and storing, 7 hours, 2 men and 2 horses at 76 cents per hour	5 32	5 32
Picking, 7 hours, 4 men at 26 cents per hour	7 28	7 28
Hauling, 5 hours, 2 men and 4 horses at $1 per hour	5 00	5 00
Total cost per acre	$ 76 01	$ 76 01
LESS: 28 bush., 40 lbs. small potatoes (Green Mountains) at 20 cents per bush.	5 73	
LESS: 51 bush., 38 lbs. small potatoes (Irish Cobblers) at 20 cents per bush.	.....	10 33
Cost of marketable potatoes	$ 70 28	$ 65 33
Yield of marketable potatoes	307·5 bush.	209·6 bush.
Cost to produce one bushel	22·8 cents	31·3 cents

POULTRY

The fall and winter of 1922-23 were not, owing to their variable and cold weather, favourable to poultry keepers, but the spring and summer were practically ideal and the set back of fall and winter was made up in the balance of the year.

The flock of Barred Plymouth Rocks has been strengthened during the year and this ultimately will be the only breed kept.

On November 1, the flock comprised the following:—

72 Barred Plymouth Rock hens,
50 Barred Plymouth Rock pullets,
32 Rhode Island Red hens,
60 Rhode Island Red pullets,
25 Male birds.

FEEDING PULLETS AND YEARLING HENS

As in the preceding year, the pullets were fed with a home-mixed scratch grain, containing one part of cracked corn, one part of wheat and one-half part

of oats. The scratch grain is scattered morning and evening, in a deep litter of straw, using judgment as to the quantity given.

The laying birds are given less scratch grain in the morning, to make them work to find their necessary feed, exercise being one of the main points when feeding for high egg production. To supplement the scratch grain, a dry mash, composed of 100 pounds of bran, 100 pounds of middlings, 100 pounds of corn meal and 50 pounds of beefscrap, is kept constantly before the birds in a hopper. Grit, shell, charcoal and fresh water are always kept at their disposition. During the winter, mangels and sprouted oats are supplied as green feed.

The yearling hens were fed the same ration as the pullets with the exception that they had only one half part of cracked corn in the scratch grain and one half part of cornmeal in the dry mash.

AVERAGE COST OF EGG PRODUCTION WITH RHODE ISLAND RED PULLETS

Average egg production per bird	83·8
Average cost per dozen of eggs	22 cents
Average selling price per dozen of eggs	35 cents
Average profit, over cost of feed, per dozen of eggs	13 cents

AVERAGE COST OF EGG PRODUCTION WITH RHODE ISLAND RED YEARLING HENS

Average eggs production per bird	93
Average cost per dozen of eggs	22 cents
Average selling price per dozen of eggs	33 cents
Average profit over cost of feed, per dozen of eggs	11 cents

It will be noted that both groups gave a profit over the total cost of feed; a profit of 89 cents per bird being made from the pullets and of 82 cents from the yearling hens. Generally, the pullets lay more eggs than the yearling hens, but in the above groups, the quality of the pullets was inferior to that of the yearling hens, since all the hens that did not do well in the pullet year were sold, and only those of a certain quality were retained. On the other hand, many of the pullets retained, produced but few eggs. However, as the pullets laid more eggs during the winter months, they still gave the higher profit for the year.

METHODS OF STORING EGGS FOR WINTER USE

To obtain information as to the best method of storing summer eggs, for which prices are relatively low, for winter use, the following experiment was conducted:—

1. Eggs stored in one-dozen cartons, without treatment.
2. Eggs wrapped in tissue paper and stored in one-dozen cartons.
3. Eggs dipped in boiling water and stored in one-dozen cartons.
4. Eggs dipped in boiling water and wrapped in tissue paper and stored in one-dozen cartons.
5. Eggs placed on small ends in earthen jars and covered with salt.
6. Eggs placed in earthen jars and covered with water glass solution.
7. Eggs placed in earthen jars and covered with lime water.

The period of preservation was from July 15 to December 15, 1923. The eggs stored were new-laid, infertile, sound in shell and clean. Once packed, they were placed in a cellar on a cement floor. The temperature varied from 45° to 50° Farenheit.

Upon examining the eggs at the close of the test, and allowing 100 per cent for new-laid eggs, the different methods of storing gave the following results:—

Method of Storing	Contents	Appearance of shell
Water glass	95	95
Lime water	95	90
Salt	85	85
Dipped into boiling water and wrapped in tissue paper	70	80
Wrapped in tissue paper	70	80
In carton boxes unwrapped	65	40
Dipped in boiling water and unwrapped	35	80

This first experiment would indicate that the use of commercial water glass solution (obtainable at most drug stores) and lime water (which can be home-made) are the two best means of preserving eggs for a fairly long period. The contents of the eggs in the lime water except for the appearance of the shell, were just as good as those in the water glass solution. Salt gave poorer results, but may be used advantageously for preserving eggs during short periods. This method is followed in results by the eggs wrapped in tissue paper.

COST OF REARING PULLETS

This experiment was sub-divided into three periods.

First period: From hatching date to three weeks of age. During this period the chicks were kept in a brooder house.

Second period: From three weeks to eight weeks of age inclusively, at the end of which the cockerels were separated from the pullets.

Third period: From eight weeks to four months of age, the pullets were placed in unheated colony houses and had access to an open yard until the period was over.

The experiment included 30 per cent of Barred Plymouth Rocks and 70 per cent of Rhode Island Reds.

The cost of feed for each period is based on the number of birds living at the end of each period.

COST OF REARING PULLETS

First Period

Group	Number at beginning of period	Number living at end of period	Grain		Mash		Milk		Eggs		Total cost
			lbs.	Cost	lbs.	Cost	lbs.	Cost	No.	Cost	
				$ cts.		$ cts.		$ cts.		$ cts.	$ cts.
1	50	35	12	0 33	26	0 67	15	0 05	10	0 25	1 30
2	100	70	25	0 70	53	1 47	30	0 09	18	0 45	2 71
3	132	102	32	0 89	77	2 00	40	0 12	26	0 65	3 66
4	118	83	18	0 50	63	1 63	20	0 06	20	0 50	2 69
Totals	400	290	87	2 42	219	5 77	105	0 32	74	1 85	10 36

COST OF REARING PULLETS—*Continued.*

Second Period

Group	Number at beginning of period	Number living at end of period	Grain		Mash		Milk		Roots		Total cost
			lbs.	Cost	lbs.	Cost	lbs.	Cost	lbs.	Cost	
				$ cts.		$ cts.		$ cts.		$ cts.	$ cts.
1	35	30	65	1 82	72	1 87	30	0 09	10	0 02	3 80
2	70	70	152	4 25	176	4 57	60	0 18	20	0 04	9 04
3	102	95	204	5 71	198	5 14	80	0 24	25	0 05	11 14
4	83	80	170	4 76	184	4 78	40	0 12	25	0 05	9 71
Totals	290	275	591	16 54	630	16 36	210	0 63	80	0 16	33 69

Third Period

Group	Number at beginning of period	Number living at end of period	Grain		Mash		Milk		Total cost
			lbs.	Cost	lbs.	Cost	lbs.	Cost	
				$ cts.		$ cts.		$ cts.	$ cts.
1	16	14	132	3 69	92	2 39	50	0 15	6 23
2	42	38	356	9 96	226	5 85	80	0 24	16 05
3	54	50	408	11 42	349	8 77	100	0 30	20 49
4	41	35	350	9 80	288	7 48	60	0 18	17 46
Totals	153	137	1,246	34 87	955	24 49	290	0 87	60 23

During the first and second periods, the birds were fed a chick scratch grain and a mash composed of equal parts of cornmeal, oatmeal, bran and beefscrap. Milk, charcoal and chick grit were also kept at their disposition.

The pullets in the third period were given chick scratch grain, and a mash composed of equal parts of cornmeal, bran, oatmeal and 20 per cent of beefscrap. Charcoal and grit were supplied in hoppers and milk was given as drink. The cost of the mixture for the chicks was 2.8 cents per pound and that of the pullets, 2.6 cents per pound.

The chicks cost an average of 3.5 cents each for the food consumed during the first period, 12 cents for the second period and 39.33 cents for the third period, making an average cost of 54.75 cents for the food consumed per pullet from hatching date to four months of age.

BEEFSCRAP VS MEAT VS MILK AS ANIMAL FEED FOR EGG PRODUCTION

In order to determine the most efficient animal food for egg production, an experiment was carried on during a period of four months with four pens each of ten birds, hatched on the same date, as uniform as possible and fed as follows:—

Pen No. 1.—Beefscrap, 15 per cent in dry mash with standard grain ration.

Pen No. 2.—Horse flesh cooked and kept constantly before the birds, plus dry mash and the standard grain ration.

Pen No. 3.—Skim-milk as drink, plus dry mash and standard grain ration.

Pen No. 4.—Control pen. Dry mash and standard grain ration only.

The standard grain ration was composed of one part of cracked corn, one part of wheat and one half part of oats, given in the litter, morning and evening.

The dry mash was composed of one part of cornmeal, one part of ground oats and one part of bran, which was fed in hoppers. At noon a wet mash was given, composed of the above mixture, moistened with milk.

The standing of the different feeds is: beefscrap, $2.83 profit; milk, $1.80 profit; standard grain ration only, $0.55 profit; meat, $0.13 profit.

As pens Nos. 2 and 3, which received milk or meat with their standard grain ration were affected with roup to a greater extent than pens Nos. 1 and 4, no definite conclusions should be drawn from this year's work, and the experiment will be continued.

HOME-MIXED FEED VS COMMERCIAL FEED FOR WINTER EGG PRODUCTION

For the purpose of testing the relative value of home-mixed scratch grain and mash as compared with a commercial mixture, an experiment was carried on for the four winter months December to March inclusive. For this purpose, two pens of twelve birds each were used, divided as equally as possible for development and uniformity.

The results showed little difference in the production of the two pens, but as the commercial mixture cost more per hundredweight than the home-mixed feed, the latter gave the greater gain, and also produced eggs at lower average cost of 12 cents per dozen.

QUEBEC EASTERN EGG LAYING CONTEST

The Egg Laying Contests throughout the Experimental Farms system, are rather of recent origin, the first contest having been held in 1918 at Charlottown, P.E.I. Until 1922, only one contest was held in Quebec, at the Cap Rouge Experimental Station, but as the interest and support shown by the poultry breeders made it evident that a contest held at the Cap Rouge Station only could not keep pace with the progress made, it was decided to have two contests, one for the west of the province at the Lennoxville Experimental Station, and the other for the east at the Ste. Anne de la Pocatière Experimental Station.

It may be well to mention for the benefit of poultry breeders, that the various agencies which have been for several years working for the registration of poultry. have succeeded in getting it officially established. To qualify for registration, birds must be of standard type, and must lay at least 200 eggs in the year, in one of the Egg Laying Contests conducted at the various Experimental Farms. These contests last one year, starting on November 1 and finishing on October 31. Ten birds constitute a pen, and all pens are housed, handled and fed in exactly the same way. An accurate record is kept of the eggs laid by each bird, together with their weight, and also of the feed consumed by each pen.

A weekly report is issued, showing the individual and the pen production for the week and the pen production to date, this being sent to all contestants, to the experimental farms, to all the agricultural colleges in Canada and several in the United States. and to others interested who make application for it. It is also published in several weekly agricultural papers and other periodicals. By these means, the owners of the birds receive valuable publicity and it is to the interest of all poultry breeders, to enter birds in an Egg Laying Contest, provided that they have the required productive qualities to do credit to their owners.

Details concerning the various contests conducted during 1922-23 including that at Ste. Anne de la Pocatière will be published in bulletin form in the near future. The results for all Canadian National contests for the years 1918 to 1922 will be found in Bulletin No. 38 (New Series).

APICULTURE

WINTERING

The winter of 1922-23 was long, the Station colonies being confined to winter quarters from October 30 until April 28. Of the thirty-eight colonies placed in the cellar, two were lost from dysentery. This is accounted to the fact that our cellar, which is of cement, was built in the early fall and a certain amount of moisture was still in the walls and floor. The colonies that were standing on the floor were most affected, although a couple of inches of sawdust had been placed on the floor beneath the hives. The temperature of the cellar was kept between 45° and 50° Farenheit as much as possible throughout the winter.

Of the eight colonies wintered in silos, six were lost from suffocation during the very severe snow storm of March. The bees of the colonies placed in silos had taken their last flight on November 15 and their first flight the following spring on April 10.

The spring was very unfavourable for the building up of colonies. April and May were dry and cold and the bees had to be fed during the month of May owing to this condition. Pollen was collected from willows on May 7 only. The crop usually gathered from dandelions, fruit trees and other flowers was practically nil.

THE SEASON

In May there were 202.7 hours of sunshine and 2.07 inches of precipitation. Owing to the prevailing cold, brood rearing developed very slowly. In June, 246.1 hours of sunshine were recorded and 1.59 inch of precipitation. The observation hive on the scale collected just enough honey to maintain itself. From May 23 to June 15, which is usually the most important period for bee keeping here, not a drop of rain fell. In July, 245.5 hours of sunshine and 0.40 inch of precipitation were recorded. The precipitation fell in three storms between July 4 and July 13. Owing to this lengthy drought, honey gathering was completely stopped on July 25.

In August, we recorded 220.2 hours of sunshine and 4.03 inches of rain, the precipitation falling after August 11. During this month, the observation hive lost from one-fourth to one-half pound daily. In September, we had 231.1 hours of sunshine and 2.22 inches of rain. During August and September, all the new colonies had to be fed, as well as all other colonies which had not a sufficient supply of honey stored for the winter.

CELLAR VS SILO WINTERING

Two groups of four colonies each and of even strength were used. One group was wintered in the silo and the other in the cellar.

The four hives wintered in the silo were all lost. After the inspection of the hives in the silo, in early spring, the bees were found dead and packed at the entrance of the hives. Hence, it was deducted that they had suffocated during a three days' storm after March 26. A chimney will be added another year, to the entrance of the silo, with the hope of preventing such ill results, as silo wintering has been quite successful here in former years.

The four hives wintered in the cellar came out in very good condition. They produced 95.5 pounds of honey valued at $17.19 and in deducting the value of sugar fed in the early spring and late fall, valued at $1.80, a profit of $15.39 was left for this group.

INTRODUCTION OF NEW QUEENS

For the last two years, we have endeavoured to italianize our apiary and this year, twenty-two Italian queens were introduced. On July 10, ten queens were introduced and eight were accepted and did good work. On September 7, twelve more Italian queens were introduced in other hives and eleven were accepted and did well.

The introduction was made by killing the old queen and by placing the cage containing the new queen on the plate of the hive.

ARTIFICIAL SWARMS

These swarms were made by removing from each of the strong colonies the queen and two frames of brood covered with bees and placing them in other hives. The frames taken away from the old hives were replaced by empty ones which were placed on the outside of the remaining frames covered with bees, brood and honey. After eight days the queenless colonies were visited and all royal cells were destroyed with the exception of one. Of the eight colonies divided, only one queen was lost in her nuptial flight.

BEE DISEASES

Very little trouble was experienced with bee diseases in 1923. On July 10, one weak colony was observed to be slightly affected with sac brood. A new queen was introduced at once and as soon as she started laying, the disease disappeared.

ARTIFICIAL FEEDING

As the summer crop of honey was very poor and the fall crop nil, artificial feeding was resorted to, so that all colonies would be in good condition before being put into their winter quarters. The Miller and home-made feeders were used. The syrup given was composed of two parts of granulated sugar dissolved into one part of warm water.

The feeding period began September 16 and was completed on October 9.

ILLUSTRATION STATIONS

Eighteen Illustration Stations are now under the supervision of this Experimental Station. Besides the repeated visits made by the supervisor delegated to these stations, they were practically all visited by the chief supervisor and the writer during the year. As may be learned through the report of the Division of Illustration Stations, all the Stations located in the eastern part of Quebec suffered very severely from the extended drought of the summer of 1923, but the stations located in Central Quebec have had very good crops. On the whole, this line of work is progressing most satisfactorily and is receiving more attention from the farmers from year to year. The work carried at these stations has been broadened during the year.

GENERAL NOTES

CEREALS

Owing to the extreme weather conditions of 1923, that is, a cold spring followed by the most severe drought ever recorded in this district, our cereal work was so badly affected that our fields of plots were resown on July 12 with a grain mixture for feed.

FORAGE CROPS

What has been said concerning the cereal work also applies to the forage crop work, though to a lesser degree. A few blocks of swede turnips and mangels gave a small crop. The corn and sunflowers gave a quarter crop. Hence, on account of the very uneven growth, no results are reported.

FERTILIZER EXPERIMENTS

A block of land has been set aside for experimental work with fertilizers and preliminary work has been done to start these experiments with the spring of 1924.

FLAX DIVISION

Owing to the cold spring which was followed by a very severe drought, the plots of flax sown germinated very badly and what started to grow was entirely eaten away by the cut-worms later. Hence, no results are available for this year.

EXPERIMENTAL PROJECTS UNDER WAY AT THE EXPERIMENTAL STATION, STE. ANNE DE LA POCATIÈRE, QUE.

ANIMAL HUSBANDRY

Project No.	Title
	SWINE
A. 114.	Mineral condiments for the brood sow.
A. 135.	Comparison of corn with barley for bacon hogs.
A. 228.	Barley vs. oats for bacon hogs.
A. 422.	Corn vs. oats for bacon hogs.
A. 423.	Economy of rearing one vs. two litters per year.
	SHEEP
A. 312.	Comparison of pure-bred vs. cross-bred sheep and lambs.
A. 328.	Breeding ewe lambs vs. breeding as shearling ewes.
A. 408.	The economy of early vs. late lambs for market.
	DAIRY CATTLE
A. 8.	Ensilage vs. roots and ensilage for milch cows.
A. 61.	Home-mixed vs. commercial meal for calves.
A. 219.	Feeding of minerals to calves and heifers.
A. 260.	Corn ensilage vs. oat hay for dairy cows.
A. 268.	Mineral feeds for dairy cows.

FIELD HUSBANDRY

	ROTATION EXPERIMENTS
F. 5.	Three-year rotation—Roots; wheat; clover.
F. 7.	Three-year rotation—Sunflowers and corn, wheat; clover.
F. 16.	Four-year rotation—Corn, sunflowers and roots; wheat; clover; timothy.
F. 30.	Five-year rotation—Roots; wheat; clover; timothy; O.P.V.
F. 36.	Five-year rotation—Potatoes and peas and oats; oats; clover; timothy; timothy.
	CULTURAL EXPERIMENTS
F. 50.	Preparation of land for root and potato crops.
F. 67.	Pasture renovation.
F. 72.	Tile-drained vs. undrained land.
	MANURE AND COMMERCIAL FERTILIZER EXPERIMENTS
F. 81.	Commercial fertilizers for hay.
	FARM MANAGEMENT EXPERIMENTS
F. 86.	Yield and profit from various grain crops.
F. 87.	Yield and profit from various hay crops.
F. 88.	Yield and profit from root and silage crops.
F. 91.	Cost of producing farm crops.

CEREALS

Ce. 1.	Common spring wheat: test of varieties or strains.
Ce. 5.	Oats: test of varieties or strains.
Ce. 6.	Barley: test of varieties or strains.
Ce. 7.	Peas: test of varieties or strains.
Ce. 8.	Beans: test of varieties or strains.
Ce. 9.	Flax: test of varieties or strains.
Ce. 10.	Spring rye: test of varieties or strains.
Ce. 50.	Multiplication of cereals.

FORAGE PLANTS

Project No.	Title
Ag. 1.	Indian corn, variety tests for ensilage purposes.
Ag. 16.	Mangels, variety tests for yield and purity.
Ag. 17.	Mangels, breeding of pure strains.
Ag. 23.	Mangels, seed growing as a commercial venture.
Ag. 24.	Mangels, stecklings vs. mature roots for seed.
Ag. 36.	Carrots, variety tests for yield and purity.
Ag. 46.	Turnips, variety tests for yield and purity.
Ag. 51.	Swedes, variety tests for yield and purity.
Ag. 52.	Swedes, breeding of pure strains.
Ag. 58.	Swedes, seed production as a commercial venture.
Ag. 59.	Swedes, methods of planting stecklings for seed production.
Ag. 66.	Sugar beets, variety tests for yield and purity.
Ag. 76.	Sunflowers, variety tests for yield and purity.

CHEMISTRY

C. 10.	Sugar beet investigation.

POULTRY

P. 76.	Standard (home-mixed) vs. commercial grain.
P. 79.	Standard (home-mixed) vs. commercial mashes.
P. 83.	Skim-milk vs. beef-scrap vs. meat.
P. 88.	Effects of various animal feeds on fertility.
P. 93.	Roots vs. clover.
P. 94.	Roots vs. clover vs. sprouted oats.

APIARY

Ap. 1.	Control of swarming by dequeening and requeening.
Ap. 2.	Control of swarming by separation of brood and queen.
Ap. 5.	Methods of detecting preparations for swarming.
Ap. 6.	Comparing different methods of handling natural swarms for efficiency.
Ap. 7.	Wintering in cellar.
Ap. 8.	Wintering in 4-colony cases.
Ap. 12.	Two-queen system.
Ap. 20.	Returns from apiaries.
Ap. 21.	Comparison of different sizes of hives.
Ap. 30.	Outdoor versus cellar wintering.
Ap. 34.	Queen rearing.

ECONOMIC FIBRES

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

HORTICULTURE

VEGETABLE GARDENING

H. 55.	Bean breeding for immunity to anthracnose.
H. 58.	Bean, different distances of planting.
H. 61.	Bean bush, variety experiment.
H. 65.	Beets, different dates of sowing.
H. 68.	Beets, variety experiment.
H. 70.	Brussels sprouts, variety experiment.
H. 72.	Cabbage, different dates of seeding for storage.
H. 77.	Cabbage, variety experiment.
H. 79.	Carrot, different dates of sowing.
H. 83.	Carrot, variety experiment.
H. 88.	Cauliflower, variety experiment.
H. 90.	Celery, blanching experiment.
H. 94.	Celery, variety experiment.

HORTICULTURE

VEGETABLE GARDENING—*Concluded*.

Project No.	Title
H. 101.	Corn, suckering experiment.
H. 102.	Corn, variety experiment.
H. 106.	Cucumber, variety experiment.
H. 107.	Egg plant, variety experiment.
H. 110.	Kohl Rabi, variety experiment.
H. 112.	Leek, variety experiment.
H. 116.	Lettuce, variety experiment.
H. 122.	Melon, musk, variety experiment.
H. 125.	Melon, water, variety experiment.
H. 138.	Onion, variety experiment.
H. 140.	Parsley, variety experiment.
H. 142.	Parsnip, different dates of sowing.
H. 145.	Parsnip, variety experiment.
H. 148.	Peas, different distances of planting.
H. 153.	Peas, variety experiment.
H. 157.	Pepper, variety experiment.
H. 160.	Potato, cost of producing.
H. 162.	Potato, different dates of planting to obtain best yield.
H. 171.	Potato, hill selection for seed.
H. 182.	Potato, spraying experiment.
H. 143.	Potato, sprouted versus unsprouted for earliness.
H. 188.	Potato, variety experiment.
H. 192.	Radish, variety experiment.
H. 193.	Rhubarb, breeding.
H. 197.	Salsify, variety experiment.
H. 201.	Squash, variety experiment.
H. 199.	Spinach, variety experiment.
H. 207.	Tomato, methods of training.
H. 211.	Tomato, variety experiment.
H. 214.	Turnip, variety experiment.

ORNAMENTAL GARDENING

H. 261.	Annual flowers, variety experiment.
H. 290.	Tulips, treated as annuals, variety experiment.