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 1924

Printed by authority of the Hon. W. R. Motherwell, Minister of Agriculture, Ottawa, 1926

EXPERIMENTAL STATION, STE. ANNE DE LA POCATIERE, QUEBEC

REPORT OF THE SUPERINTENDENT, J. A. STE. MARIE, B.S.A.

THE SEASON

With the year 1924, a favourable change came for the farmers of this district who had greatly felt the previous droughts of 1922 and 1923. The winter was quite open and followed by a long and cold spring which delayed the first seeding of grain to the 15th of May. The cold spring was followed by a dry and cold month of June and that temperature was not favourable to the growing of corn and other heat-loving crops. However, from June, the weather improved greatly with the results that very good crops were harvested, excepting of corn and sunflowers, which yielded poorly.

METEOROLOGICAL RECORDS AT STE. ANNE, QUE., 1924

Month	Temperature F.					Precipitation			Total sunshine
	Highest	Date	Lowest	Date	Mean	Rain-fall	Snow-fall	Total Precipi-tation	
						inches	inches	inches	hrs. min.
January	40	25	−12·0	27	8·76	0·12	36·0	3·72	100·40
February	32	27	−10·0	18	10·2	.....	25·0	2·50	156·55
March	46	22	8·0	4	26·83	.....	12·5	1·25	112·15
April	59	27	14·0	1	34·7	3·25	31·0	6·35	165·50
May	79	18	30·0	21	47·5	4·39	.....	4·39	188·30
June	85	23	38·0	3	59·8	2·91	.....	2·91	260·20
July	85	6	48·0	30	65·66	5·77	.....	5·77	293·20
August	80	24	39·0	31	62·16	4·57	.....	4·57	206·15
September	75	1	30·0	25	56·8	4·41	.....	4·41	185·10
October	72	4	28·0	10	46·32	1·24	1·0	1·34	174·45
November	62	6	6·0	19	34·52	2·17	5·0	2·67	65·5
December	39	10	−15·0	28	11·16	0·60	8·0	1·40	74·15
Totals	85	.....	−15·0	.....	38·7	29·43	118·5	41·28	1,981·95

TWELVE YEARS OF PRECIPITATION AT STE. ANNE, QUE.

——	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	Ave. 12yrs.
January	4·05	2·15	1·62	2·42	3·10	2·80	3·10	0·90	1·60	1·25	1·55	3·72	2·35
February	2·45	1·30	3·68	2·58	2·40	3·40	2·20	2·70	2·00	1·70	0·65	2·50	2·29
March	4·47	1·33	0·80	1·50	3·90	0·82	3·65	3·02	5·09	1·70	3·55	1·25	2·59
April	1·32	1·19	2·07	0·94	2·31	1·25	4·94	6·07	2·03	1·92	3·68	6·35	2·84
May	2·69	3·28	4·01	3·47	3·64	4·24	3·76	1·16	1·56	2·19	2·67	4·39	3·08
June	1·32	0·92	2·30	5·18	7·68	5·13	1·80	1·07	1·53	6·17	1·59	2·91	3·13
July	3·64	0·64	1·81	1·89	2·29	6·73	4·22	4·47	2·72	1·48	1·00	5·77	3·05
August	1·34	1·04	3·05	0·75	3·63	1·01	3·69	1·87	3·30	2·12	4·03	4·57	2·53
September	2·31	2·34	3·85	3·07	1·18	6·60	3·86	5·89	2·78	0·65	2·22	4·41	3·30
October	3·42	3·61	2·20	5·66	5·56	0·60	2·39	3·69	4·74	2·62	6·25	1·34	3·50
November	0·77	1·99	1·67	2·43	1·38	1·22	1·68	1·05	1·13	2·11	5·01	2·67	1·92
December	1·18	0·89	1·95	4·32	1·34	0·80	1·20	3·85	1·74	1·81	0·96	1·40	1·78
Totals	29·40	20·68	29·01	34·21	38·41	34·60	36·48	35·74	30·22	25·72	33·16	41·28	32·41

EXTREME HIGHEST, EXTREME LOWEST AND MEAN TEMPERATURES AT STE. ANNE, 1913 TO 1924

Month	1913			1914			1915			1916			1917			1918		
	Highest	Lowest	Mean	Highest	Lowest	Mean	Highest	Lowest	Mean	Highest	Lowest	Mean	Highest	Lowest	Mean	Highest	Lowest	Mean
January	.....	.....	.....	38·4	−30·8	12·9	38·5	−18·8	16·2	44·7	−13·5	11·42	38·8	−28·2	8·9	34·6	−27·0	8·6
February	.....	.....	.....	26·8	−32·0	5·9	39·5	−16·3	17·7	37·7	−22·2	9·0	34·3	−19·2	6·22	45·8	−28·6	7·4
March	.....	.....	.....	46·2	− 3·2	24·4	43·7	− 6·0	22·6	44·1	−10·3	13·03	46·7	6·3	24·6	45·8	− 6·6	19·1
April	82·2	8·8	38·3	61·0	4·4	31·3	59·9	15·4	39·16	59·6	18·4	37·7	53·7	12·6	34·1	65·4	24·4	38·2
May	87·2	22·0	49·5	81·2	22·2	53·4	69·6	29·6	48·7	77·4	30·0	47·5	58·7	29·8	42·0	83·2	30·6	49·4
June	74·2	36·4	56·4	80·8	32·6	56·8	81·6	32·4	57·9	81·0	39·4	58·7	81·2	35·0	54·6	81·4	33·0	54·8
July	82·4	44·0	61·7	91·4	36·4	63·7	86·6	43·9	64·4	90·8	53·0	72·4	89·2	40·2	61·6	87·3	38·8	59·7
August	81·2	40·6	59·3	89·4	34·8	60·0	85·2	38·4	61·7	92·4	43·3	65·0	90·7	36·6	59·7	81·4	35·0	56·7
September	81·6	33·2	51·8	82·4	23·4	50·5	84·5	34·9	55·7	89·4	35·2	57·1	77·7	32·4	50·6	74·2	32·8	47·6
October	75·4	24·4	46·2	66·6	31·6	47·2	67·0	26·6	46·0	73·2	22·2	39·4	70·4	30·4	41·3	62·2	31·4	43·1
November	63·2	4·0	36·8	47·0	2·4	24·2	47·4	16·3	32·1	59·2	− 1·1	25·5	43·0	1·2	27·0	54·3	8·8	32·2
December	36·2	−12·4	17·2	45·0	−24·2	9·6	34·6	−10·4	20·9	44·0	−14·7	14·0	39·4	−26·8	14·2	42·5	− 4·2	16·0
	82·4	−12·4	46·3	91·4	−32·0	36·6	86·6	−18·8	40·3	92·4	−22·2	37·56	90·7	−28·2	35·4	87·3	−28·6	36·06

Month	1919			1920			1921			1922			1923			1924		
	Highest	Lowest	Mean	Highest	Lowest	Mean	Highest	Lowest	Mean	Highest	Lowest	Mean	Highest	Lowest	Mean	Highest	Lowest	Mean
January	38·2	−23·8	12·6	28·2	−28·2	1·87	37·8	− 8·2	15·4	34·8	−17·2	11·8	42·0	−16·0	11·36	40·0	−12·0	8·76
February	34·9	− 4·3	17·7	35·2	−28·2	12·8	39·8	−11·2	13·5	41·8	−15·2	12·7	35·0	−20·0	14·15	32·0	−10·0	10·2
March	56·0	− 3·8	24·0	61·0	−19·2	24·0	60·8	−14·2	26·6	54·8	−15·2	29·3	49·5	−10·0	21·7	46·0	8·0	26·80
April	50·2	18·6	32·7	60·8	22·6	37·2	78·4	10·8	38·6	74·2	23·2	40·2	56·0	4·0	33·01	59·0	14·0	34·7
May	78·2	30·6	46·1	79·8	32·2	49·5	84·9	30·6	53·6	83·2	28·2	54·1	74·0	30·0	53·07	79·0	30·0	47·5
June	95·2	34·6	61·3	81·2	34·0	58·0	87·3	38·5	60·9	86·2	42·7	60·8	92·0	37·0	61·5	85·0	38·0	59·8
July	87·5	39·8	62·1	80·4	39·4	61·7	94·4	42·7	71·5	87·2	40·5	68·0	89·0	30·0	62·9	85·0	48·0	65·66
August	80·8	35·0	58·1	88·2	37·6	62·5	88·2	39·8	63·2	83·2	41·2	62·3	84·0	38·0	60·8	80·0	39·0	62·16
September	78·0	32·0	51·5	82·7	35·4	55·3	82·9	30·2	57·7	86·7	24·5	59·5	75·0	33·0	54·6	75·0	30·0	56·8
October	60·3	24·4	42·4	68·4	28·5	46·5	75·2	22·2	44·8	78·6	20·7	42·7	70·0	27·0	45·7	72·0	28·0	46·32
November	58·0	21·6	35·1	50·8	5·2	27·3	58·8	− 8·2	26·0	53·0	10·3	31·2	50·0	13·0	34·0	62·0	6·0	34·52
December	42·5	−26·6	13·3	35·0	−15·4	15·7	40·5	−12·8	17·6	48·0	−13·5	15·8	50·0	0·0	27·28	39·0	−15·0	11·16
	95·2	−26·6	38·07	88·2	−28·2	37·69	94·4	−14·2	40·78	87·2	−18·5	40·7	92·0	−20·0	40·0	85·0	−15·0	38·69

ANIMAL HUSBANDRY

HORSES

The draught horses of this Station are all of the Percheron breed, there being a total of eighteen head made up of:—

12 females, three years old and over.
3 females, two years old.
1 female, one year old.
1 stallion, four years old.
1 stallion, two years old.

A French-Canadian pure-bred female is used for driving.

Owing to the lack of a Percheron stallion of quality in the district, very little progress was made during the year. Of the four mares bred, only one had a foal which was raised successfully.

The following charges were made in computing the tables "Feed Consumed by Draught Horses," "Feed Consumed by Colts from Birth to One Year Old" and "Feed Consumed to Raise a Horse from Birth to 2½ Years Old," etc.:—

Hay, $11 per ton.
Wheat bran, $22 per ton.
Oats, 57 cents per bushel.
Pasture, $2 per month.

FEED CONSUMED BY DRAUGHT 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.
Mela	12	1,660	5,545	5,154	718	128 71	2,002	6·4
Belle	8	1,633	5,645	5,114	718	128 58	1,947	6·6
Beatrice	7	1,606	5,645	5,254	718	130 96	1,595	8·2
Minette	7	1,776	5,645	5,144	738	129 38	1,896	6·8
Melina	6	1,642	5,714	5,154	718	129 64	2,155	6·0
Fanchette	6	1,517	5,635	5,154	718	129 20	1,984	6·5
Joconde	4	1,566	5,575	5,154	718	128 87	2,262	5·7
Juliette	4	1,690	5,570	5,154	718	128 83	1,818	7·1
Mathilda	4	1,642	5,605	5,134	718	128 70	1,926	6·7

The table shows that horse labour was supplied at an average cost of 6·7 cents per hour.

COST OF RAISING COLTS FROM BIRTH TO ONE YEAR OLD

Name	Date of birth	Weight		Feed consumed			Cost of feed
		Birth	One year	Hay	Oats	Bran	
		lbs.	lbs.	lbs.	lbs.	lbs.	$ cts.
Ste. Anne Minette 2	May 1, 1923	210	1,000	1,624	1,260	464	37 19
Ste. Anne Mela 4	May 14, 1923	200	1,000	1,506	1,145	414	33 85
Ste. Anne Julia 3	May 31, 1923	190	925	1,422	1,071	358	31 31

The table shows that the cost of feed for raising colts to one year of age is from $31 to $37.

COST OF RAISING COLTS FROM BIRTH TO 2½ YEARS OF AGE

Name	Date of birth	Weight		Feed consumed			Pasture	Cost of feed
		Birth	2½ years	Hay	Oats	Bran		
		lbs.	lbs.	Hay	lbs.	lbs.	Mos.	$ cts.
Mela 3	June 22, 1922	200	1,600	4,602	3,881	833	8	119 57
Jeannette	July 14, 1922	220	1,525	4,992	4,116	785	8	125 01

The table gives the required amount and cost of hay, bran and oats for growing a colt up to the age when it can be broken for service.

The cost of growing a colt up to 2½ years of age has not changed materially in the last few years. The present scarcity of good draught horses in the eastern provinces and the abundance of cheap roughage ought to be factors to induce a greater number of farmers to pay more attention to the question of raising good draught horses.

DAIRY CATTLE

The Ayrshire herd has much improved in quality, production and type during the year. At the end of the year it was composed of twenty-five milk cows, seventeen heifers, ten calves six months old and over and eight calves less than six months of age. All of these animals are kept for breeding, experimental and demonstration work. Some excellent records were made, as the reader will note by referring to the table giving the records. Special mention might be made of the cow "Briery Lass" No. 85707. This cow completed a record of 16,123.4 pounds of milk and 596.57 pounds of fat in 371 days.

The bull heading the herd is "Ottawa Lord Kyle" No. 77049, a prize winner at the 1922 " Royal ", sired by " Overton Lord Kyle ", imported by the Central Experimental Farm, Ottawa, from a R.O.P. dam.

MIXED SUNFLOWER AND CORN SILAGE VS OATS, PEAS AND VETCH HAY

(Project No. A 260)

Owing to the fact that the mixture of oats peas and vetches for hay is generally a successful crop in this district, it was thought advisable to conduct an experiment for a few years, to determine the economy of feeding this hay mixture to dairy cows to replace silage.

Eight cows were used for this purpose and were fed during three periods of three weeks each. The last two weeks of each period were taken for data. The average of the first and third periods is used in comparison with the second period, as it eliminated the natural decline in milk flow.

First period: the cows were getting their ration of hay, sunflower and corn silage, and grain mixture.

Second period: replacement of sunflower and corn silage by oats, peas and vetch hay.

Third period: same as the first period.

The meal mixture was composed of wheat bran, 4 parts; oats, 1 part; distiller's grain, 2 parts; barley, 2 parts; linseed meal, 1 part.

The prices charged for the feeds used were as follows:—

Meal mixture	$ 37 60	per ton
Hay	11 00	"
Corn silage (cost figures)	4 02	"
O.P.V. hay "	8 82	"

The results may be seen in the following table:—

SILAGE VS. OAT, PEA AND VETCH HAY

—	Period No. 1 Ensilage	Period No. 2 O.P.V.	Period No. 3 Ensilage	Average periods Nos. 1 and 3 Ensilage
Number of cows in test	8	8	8	8
Pounds of milk produced	2,453·5	2,147·0	1,706·1	2,079·8
Average pounds milk per cow per day	21·9	19·2	15·2	18·6
Total pounds ensilage consumed	4,410	.....	4,410	4,410
Total pounds O.P.V. consumed	.....	1,316	.....	.....
Total pounds hay consumed	1,260	1,260	1,260	1,260
Total pounds meal consumed	868	868	570	719
Lbs. silage consumed per 100 lbs. milk	179·7	.....	258·5	219·1
Lbs. O.P.V. consumed per 100 lbs. milk	.....	61·3	.....	.....
Lbs. meal consumed per 100 lbs. milk	35·4	40·4	33·4	34·4
Cost of ensilage consumed	$8·86	.....	$8·86	$8·86
Cost of O.P.V. consumed	.....	$5·80	.....	.....
Cost of hay consumed	$6·93	$6·93	$6·93	$6·93
Cost of meal consumed	$16·32	$16·32	$10·72	$13·52
Total cost of feed	$32·11	$29·05	$26·51	$29·31
Cost of feed to produce 100 lbs. milk	$1·31	$1·35	$1·50	$1·40½

It will be seen from the preceding table that it is possible to produce milk at a slightly lower cost with O.P.V. hay than with corn and sunflower silage, when using cost of production figures for the district, where corn or other silages cannot be grown successfully, or in certain years, is harvested in a stage of immaturity.

In the next year's report we will be able to give an average of three years for this experiment.

CORN AND SUNFLOWER SILAGE VS ROOTS *(Project No. A 7)*

In this experiment silage is compared with roots to determine if there is an advantage for a farmer to feed roots instead of silage, as silage in this district is more or less an unreliable and somewhat expensive crop to grow.

The procedure was the same as for the preceding experiment and roots were charged $3.42 per ton, the average cost of growing roots on the farm for 1924.

CORN AND SUNFLOWER SILAGE VS. ROOTS

—	Period No. 1	Period No. 2	Period No. 3	Average periods Nos. 1 and 3
	Ensilage	Roots	Ensilage	Ensilage
Number of cows in test	7	7	7	7
Pounds of milk produced	1,643·7	1,612·8	1,559	1,601·35
Average lbs. milk per cow per day	16·77	16·46	15·90	16·33
Total lbs. ensilage consumed	3,715	.....	3,715	3,715
Total lbs. roots consumed	.....	3,715	.....	.....
Total lbs. hay consumed	980	980	980	980
Total lbs. meal consumed	550	592	520	535
Lbs. silage consumed per 100 lbs. milk	226	.....	238	232
Lbs. roots consumed per 100 lbs. milk	.....	234	.....	.....
Lbs. meal consumed per 100 lbs. milk	33·5	36·7	33·4	33·45
Cost of silage consumed	$7·47	.....	$7·47	$7·47
Cost of roots consumed	.....	$6·35	.....	.....
Cost of hay consumed	$5·39	$5·39	$5·39	$5·39
Cost of meal consumed	$10·34	$11·13	$9·78	$10·06
Total cost of feed	$23·20	$22·87	$22·64	$22·92
Cost of feed to produce 100 lbs. milk	$1·41	$1·42	$1·45	$1·43

The cost of milk production was one cent less per hundred pounds with roots than with silage. The cost of growing roots being lower than that of the silage, it gives the advantage to the roots.

In the next table, where corn has been replaced partially by roots, the cost to produce 100 pounds of milk is one cent higher with roots and silage than with corn silage.

ROOTS AND ENSILAGE VS. ENSILAGE

—	Period No. 1	Period No. 2	Period No. 3	Average periods Nos. 1 and 3
	Ensilage	Roots and Ensilage	Ensilage	Ensilage
Number of cows in test	5	5	5	5
Pounds of milk produced	1,510·3	1,292·5	1,257·5	1,383·9
Average pounds milk per cow per day	21·58	18·46	17·96	19·77
Total lbs. ensilage consumed	2,315	1,190	2,315	2,315
Total lbs. roots consumed	.....	1,190	.....	.....
Total lbs. hay consumed	588	588	588	588
Total lbs. meal consumed	520	440	430	475
Lbs. silage consumed per 100 lbs. milk	153	92	184	168½
Lbs. roots consumed per 100 lbs. milk	.....	92	.....	.....
Lbs. meal consumed per 100 lbs. milk	33·1	32·5	34·2	33·6
Cost of silage consumed	$4·65	$2·35	$4·65	$4·65
Cost of roots consumed	.....	$2·57	.....	.....
Cost of hay consumed	$3·23	$3·23	$3·23	$3·23
Cost of meal consumed	$9·78	$8·27	$8·08	$8·93
Total cost of feed	$17·66	$15·88	$15·96	$16·91
Cost of feed to produce 100 lbs. milk	$1·17	$1·23	$1·27	$1·22

The above tables show from this year's experiment that in this district, the roots are better for the production of milk, for two reasons:

1. The yield of roots per acre being better, comparatively, than that of corn and sunflower silage, the cost of production of the former is lower.

2. Corn cannot be raised successfully in this district, the season being too short to permit the harvesting of the crop in a sufficiently mature stage to yield 20 pounds of dry matter per 100 pounds of corn silage. The analysis of our corn and sunflower silage shows that the percentage of dry matter contained in it is lower than 15 per cent. In studying this experiment, however, it should be kept in mind that it is a comparison of other crops with the silage grown in this district and the results should not be applied to feeding in all districts in Quebec province, as in some districts corn silage does much better.

MILK PRODUCTION

The following table gives the records of all the cows and heifers having finished their lactation period during the year. The feeds were charged as follows:—

Pasture per month per cow	$ 1 00	
Meal mixture	$ 37 60	per ton
Hay	11 00	"
Roots	3 42	"
Silage	4 02	"
Green feed	8 35	"

The cost of the three last feeds enumerated are the cost of raising, and the others are the market prices for the year 1924.

Name of cow	Date of calving	Number of days in 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 37 cents per pound	Value of skim-milk at 20 cents per cwt.	Total value of products	Amount of meal eaten at 1·88 cent per pound	Amount of roots at $3.42 per ton and silage at $3.02 per ton	Amount of hay eaten at $11 per ton	Amount of green feed at $8.45 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
			lbs.	lbs.		lbs.	$ cts.	$ cts.	$ cts.	lbs.	lbs.	lbs.	lbs.		$ cts.	$cts.	c.	c.	$ cts.
Briery Lass	Jan. 1, 1924	371	16,123·4	46·15	3·7	697·99	258 26	31 07	289 33	5,241	8,474	1,940	2,875	4½	141 61	0 88	20	17	147 72
Primrose	Sept. 9, 1923	369	9,316·5	25·52	4·16	448·00	165 76	17 87	183 63	3,312	7,336	2,260	1,715	4½	100 10	1 07	22	15	83 53
Mignonne	Jan. 22, 1924	384	9,351·9	24·35	3·84	420·16	155 46	17 99	173 45	3,087	7,635	1,460	2,703	4½	96 19	1 03	23	14	77 26
Beaver Meadow Beauty 6.	Mar. 26, 1924	280	9,008·1	32·17	3·82	402·61	148 97	17 33	166 30	3,273	5,330	1,195	2,775	4½	94 23	1 05	23	14	72 07
Lady Jane	Feb. 6, 1924	303	9,189·8	30·33	3·78	406·43	150 38	17 68	168 06	3,203	7,060	1,210	3,225	4½	98 13	1 07	24	13	69 93
Alisette du Lac	Jan. 20, 1924	314	8,427·9	26·84	3·97	391·46	144 84	16 19	161 03	2,964	7,170	1,630	2,725	4½	94 03	1 12	24	13	67 00
Palida de Ste. Anne 2	May 24, 1923	428	7,871·2	18·39	4·49	413·50	153 00	15 04	168 04	2,767	8,560	2,155	3,935	7	103 41	1 31	25	12	64 63
Lennoxville Bluebell 2nd	Dec. 8, 1924	319	8,217·5	25·76	4·22	405·73	150 12	15 74	165 86	3,296	7,760	1,937	2,645	4½	102 54	1 25	25	12	63 32
Milkmaid	Feb. 26, 1924	301	7,621·2	25·32	4·05	361·12	133 61	15 63	149 24	2,746	6,456	1,139	2,845	4½	86 41	1 13	24	13	62 83
Dahlia	April 25, 1924	290	6,857·9	23·64	4·12	330·58	122 31	13 15	135 46	2,339	5,180	770	3,195	4½	75 83	1 11	23	14	59 63
Fadette	Oct. 25, 1923	265	6,182·4	23·33	4·39	317·55	117 49	11 82	129 31	2,227	6,636	2,072	160	4½	70 79	1 13	22	15	58 52
Lawndale Daisy	Sept. 15, 1923	336	7,179·6	21·37	4·27	358·69	132 72	13 75	146 47	2,961	7,196	2,182	1,805	4½	93 18	1 30	26	11	53 29
Suzette	Mar. 15, 1924	285	8,518·8	29·89	3·4	338·88	125 39	16 46	141 85	2,989	5,695	855	3,335	4½	90 02	1 06	27	10	51 83
Springburn Lovely Act	Feb. 8, 1924	334	7,660·2	22·94	3·8	340·58	126 01	14 74	140 75	2,885	6,390	1,420	2,805	4½	90 29	1 18	27	10	50 46
Lady of Riverside	June 4, 1923	320	6,747·3	20·46	4·34	342·61	126 77	12 91	139 68	2,261	7,996	1,660	4,220	7	91 34	1 35	27	10	48 34
Lennoxville Doreen 2nd	Sept. 26, 1923	345	6,942·7	20·13	3·71	301·36	111 50	13 37	124 87	2,490	9,400	1,295	3,055	5	89 32	1 29	30	07	35 55
Springburn Lovely Star	Oct. 2, 1923	380	5,692·6	14·98	4·09	272·41	100 79	10 92	111 71	2,071	8,475	2,460	2,205	4½	82 04	1 44	30	07	29 67
Malonie de Ste. Anne, 2	April 9, 1924	250	4,133·7	16·54	4·08	197·33	72 91	7 93	80 84	1,799	5,190	820	3,090	4½	65 57	1 59	33	04	15 27
Lennoxville Mary 2nd	Sept. 22, 1923	286	4,439·1	15·59	3·8	197·37	73 08	8 34	81 37	1,972	7,940	2,165	850	5	71 37	1 61	36	01	10 00

TABLE SHOWING THE HERD'S AVERAGE PRODUCTION AND THE PRODUCTION OF THE FIVE BEST COWS.

—	Age Yrs.	No. of days	Total lbs. of milk for period	Pounds of butter produced in period	Total value of product	Total cost of feed	Profit on cow
			lbs.	lbs.	$ cts.	$ cts.	$ cts.
Total for herd (19 cows)			149,481·8	6,546·66	2,858 75	1,736 40	1,121 85
Average for herd (19 cows)			7,867·8	344·56	150 46	91 39	59 05
Briery Lass, (85707)	7	371	16,123·4	697·99	289 33	141 61	147 72
Primrose, (78271)	2	369	9,3.6·5	448·00	183 63	100 10	83 53
Mignonne, (57468)	7	384	9,351·9	420·16	173 45	96 19	77 26
Beaver Meadow Bty. 6 (74584)	3	280	9,008·1	402·61	166 30	94 23	72 07
Lady Jane, (63284)	7	303	9,189·8	406·43	168 06	98 13	69 93
Total for five cows		1,707	52,989·7	2,375·19	980 77	530 26	450 51
Average for five cows		341·4	10,597·4	475·04	196 15	106 05	90 10

CALF BREEDING EXPERIMENT (*Project No. A61*)

Rearing dairy calves correctly and economically is one of the most important factors in raising the standard of production in dairy cows on a farm. With this practical point of view in mind, an experiment with home-mixed vs. commercial calf meal was planned.

The calves were fed whole milk from birth to four weeks old; then they were gradually changed over to a ration of skim-milk and calf meal, either home-mixed or Blatchford, the calves being divided into two groups.

The daily ration of skim-milk was one-tenth of the body weight up to fifteen pounds. As soon as the calves started to eat, they were fed oats and wheat bran in equal parts, which was replaced later on by a grain mixture consisting of five parts oats, three parts of wheat bran, one part of ground corn and one part of linseed meal.

As already mentioned the calves were divided into two groups. The first group received a daily ration of skim-milk plus home-mixed calf meal, composed of two parts of oatmeal, two parts of cornmeal, one part of middlings and one part of ground linseed.

The second group, same ration of skim-milk plus commercial calf meal (Blatchford).

In the following table is given the weight of the two groups at birth, three months and six months of age:—

HOME-MIXED VS. COMMERCIAL MEAL FOR CALVES

—	Group No. 1 Home-mixed meal	Group No. 2 Blatchford meal
Number of animals	5	5
Weight at birth	337 lbs.	350 lbs.
Average weight at birth	67·4 "	70·0 "
Total weight at three months of age	1,001 "	921 "
Average weight at three months of age	200·5 "	184·2 "
Total weight at six months of age	1,921·0 "	1,783·0 "
Average weight at six months of age	384·2 "	356·6 "

Average gain of home-mixed meal over Blatchford meal.....27·6 lbs.

Lot No. 1 had an average gain of 27·6 pounds over lot No. 2, which illustrates the possibility of developing calves with home-mixed meals as well as with commercial meals. The next table will show the most economical meal to use.

FEED CHARGES

Hay	$ 11 00 per ton
Roots	3 42 "
Silage	4 02 "
Grain	1 90 per cwt.
Blatchford	4 70 "
Home-mixed meal	2 80 "
Whole milk	2 00 "
Skim-milk	20 "

HOME-MIXED VS. COMMERCIAL MEAL FOR CALVES

—	Group No. 1 Home-mixed meal	Group No. 2 Blatchford meal
	$ cts.	$ cts.
Whole milk, 1,750 lbs.	35 00	35 00
Skim-milk, 7,500 lbs.	15 00	15 00
Blatchford meal, 600 lbs.	.....	28 20
Home-mixed meal, 600 lbs.	16 80	.....
Grain, 950 lbs.	18 05	18 05
Silage and roots, 3,600 lbs.	6 70	6 70
Hay, 2,850 lbs.	15 68	15 68
Total cost of feed	105 23	118 63
Cost per head	21 05	23 73

The conclusion to be drawn from this experiment is that feeding home-mixed calf meal with skim-milk is more economical than Blatchford meal and skim-milk,—when a farmer is prepared to supply to his calves a mixture of the various meals in the right proportion.

SWINE

Twelve Yorkshire sows and one boar were kept at this Station during the year. Eight of the above sows gave birth to eighty pigs of which sixty-one were reared. Nineteen males and females were sold for breeding and the balance used for experimental work and sold for pork.

CORN VS. BARLEY VS. OATS (*Project No. A. 135*)

—		Group No. 1 Corn	Group No. 2 Barley	Group No. 3 Oats
Number of pigs		5	5	5
Initial weight, gross	lbs.	557	549	542
Initial weight, average	"	111·4	109·8	108·4
Finished weight, gross	"	1,166	1,129	1,013
Finished weight, average	"	233·1	225·4	202·3
Number of days in experiment	days	78	78	78
Total gain for period	lbs.	609	580	471
Average gain per animal	"	121·8	115	94·2
Quantity of corn eaten by group	"	1,345	.....	.....
Quantity of barley eaten by group	"	.....	1,588	.....
Quantity of oats eaten by group	"	.....	.....	1,289
Quantity of shorts eaten by group	"	90	378	75
Quantity of middlings eaten by group	"	690	328	703
Quantity of skim-milk eaten by group	"	500	550	600
Pounds of meal eaten per pound gain	"	3·48	3·94	4·39
Pounds of skim-milk eaten per pound gain	"	·82	·94	1·27
Total cost of feed	$	39·64	42·87	39·41
Cost of feed per head	$	7·93	8·57	7·88
Cost of feed per head per day	$	0·096	0·104	0·096
Cost of feed to produce 1 lb. gain	$	0·065	0·073	0·083

In the above table, it will be noted that it took slightly more barley and more oats than corn to produce one pound of gain, also at an increased cost per pound at the prices quoted for the feeds in this experiment. But, had the hogs been sold on the quality of the pork for the bacon trade, there is no doubt that the increased cost of production of group No. 2 fed with barley, and No. 3 fed with oats over that of the group No. 1 fed with corn, would have been offset by the increased price obtained for the hogs in lots 3 and 2 through the higher classification of these hogs. Those fed with oats were leading in quality, followed by the group fed with barley and last came the hogs fed with corn.

From a practical point of view, corn is generally expensive and difficult to obtain in this district and the experiment demonstrates that pork can be raised and finished advantageously with barley and oats, both crops that can be grown easily and successfully on most farms. The advantage of using liberal quantities of skim-milk or other milk by-products is also of practical importance.

FINANCIAL STATEMENT FOR YORKSHIRE BROOD SOWS

Name	Kind of feed fed	Pounds of feed consumed	Cost price per ton	Value of feed consumed	Date farrowed 1924	No. of pigs in litter	No. pigs raised	Per cent pigs raised	Cost of litter from farrowing to 6 weeks	Actual average cost of one pig at six weeks
			$ cts.	$ cts.					$ cts.	$ cts.
Brillante	Bran	979·6	29 50	12 97	Jan. 25	8	4	50·0	4 19	6 52
	Shorts	721·1	31·00	11 17						
	Skim-milk	58·2	4 00	0 12						
	Hay	211·0	11 00	1 16						
	Roots	456·0	3 00	0 68						
Brillante 2	Bran	1,111·9	29 50	16 40	March 20	6	6	100	3 89	5 44
	Shorts	893·6	31 00	13 85						
	Skim-milk	169·0	4 00	0 33						
	Hay	259·0	11 00	1 42						
	Roots	458·0	3 00	0 68						
Flavie	Bran	700·4	29 50	10 33	Jan. 24	16	9	56·0	4 38	2 34
	Shorts	607·4	31 00	9 41						
	Skim-milk	58·2	4 00	0 12						
	Hay	90·2	11 00	0 49						
	Roots	965·4	3 00	0 72						
Duchesse de Ste. Anne 9	Bran	686·4	29 50	10 12	April 5	6	4	66·6	3 68	4 96
	Shorts	541·6	31 00	8 39	5					
	Skim-milk	156·0	4 00	0 31						
	Hay	88 0	11 00	0 48						
	Roots	384·5	3 00	0 57						
Ste. Anne Brillante 3.	Bran	686·4	29 50	10 12	April 3	6	2	33·3	3 68	4 96
	Shorts	541·6	31 00	8 39						
	Skim-milk	156·0	4 00	0 31						
	Hay	88·0	11 00	0 48						
	Roots	384·5	3 00	0 57						
Ste. Anne Brillante 4.	Bran	1,388·3	29 50	20 48	March 31	8	8	100·0	3 88	2 36
	Shorts	1,181·3	31 00	18 31						
	Skim-milk	377·5	4 00	0 75						
	Hay	280·0	11 00	1 37						
	Roots	499·5	3 00	0 72	Nov. 19	11	10	90·0	5 89	
Ste. Anne Brillante 5.	Bran	1,327·3	29 50	19 57	April 15	5	5	100·0	3 68	5 19
	Shorts	1,215·3	31 00	18 83						
	Skim-milk	417·5	4 00	0 83						
	Hay	250·0	11 00	1 37						
	Roots	605·0	3 00	0 90	Nov. 219	4	3	75·0	4 88	
Alerte de Ste. Anne 2.	Bran	942·9	29 50	13 91	May 10	10	10	100·0	4 47	2 70
	Shorts	743·9	31 00	11 53						
	Skim-milk	62·5	4 00	0 12						
	Hay	148·0	11 00	0 81						
	Roots	421·0	3 00	0 63						

SOME SIGNIFICANT AVERAGES

Average pounds meal per day per sow		7
Average cost of meal mixture per ton	$	30 25
Total cost of feed for one sow for one year	$	28 71
Average number of pigs per litter	$	10 00
Average number of pigs raised		7·6
Average per cent of pigs raised		7·6
Average cost of litter at six weeks	$	4 26
Average actual cost of one pig at six weeks	$	4 31
Average value per pig at six weeks	$	6 00
Average profit per pig over feed cost	$	1 69
Average profit per sow	$	12 84
Profit over feed cost from eight sows	$	102 72

From this statement, it will be noted that the actual cost of raising young pigs to six weeks of age, varies with the number of pigs raised. This fact will be readily understood but it will also be noted in the table that the pigs raised, although at a relatively high cost for some of them, are yet cheaper, even the most expensive, than if we had had to purchase them.

The raising of pigs could be more popular on most farms, and the table shows the possibility of profit-making as well as of producing pigs of superior quality.

SHEEP

The flock of Leicester sheep kept at this Station is composed of fifty-four head, namely, forty breeding ewes, twelve ewe lambs, one imported Leicester ram and one Shropshire ram kept for a crossing experiment.

The year 1924 was more advantageous for sheep-breeders than the year 1923 in this part of the province, as the pastures were much superior to 1923 and the coarse roughage cheaper. The prices obtained for mutton and wool were also slightly more remunerative.

The imported Leicester ram at the head of our pure-bred flock has given progeny superior to that left by previous rams and the present flock has attained a fair degree of quality.

From the twenty-five Leicester ewes, eighteen males and twelve females were raised. All the good ram lambs were sold for breeding as well as a few ewe lambs. The others were retained to replace some of our older ewes.

CROSS-BRED VS. PURE-BRED LAMBS *(Project No. A. 518)*

—	Group No. 1 — Cross-bred	Group No. 2 — Pure-bred
Number of ewes in experiment	15	15
Number of lambs raised	13	13
Weight of lot at birth	104 lbs.	103·5 lbs.
Average weight per head at birth	8 "	7·9 "
Weight of lot at 6 months of age	1,029 "	984 "
Increase of lot in six months	925 "	870·5 "
Increase per head in six months	71·1 "	66·2 "

As can be noted in the table, fifteen pure-bred Leicester ewes were again this year bred to a pure-bred Shropshire ram. The number of lambs raised was the same for both groups but the cross-bred lot was much more uniform at the age of six months and weighed an average of 3·9 pounds more per lamb. The main characteristic of the cross-bred lot was their uniformity which made them attractive to the purchasers of lambs for the market.

—	Group No. 1 — Early lambing	Group No. 2 — Late lambing
Number of ewes used in experiment	6	6
Number of lambs raised	7	7
Weight of lot at birth	56 lbs.	56 lbs.
Average weight per head at birth	8 "	8 "
Weight of lot at six months of age	607 "	511 "
Increase of lot in six months	551 "	455 "
Increase per head in six months	78·7 "	65 "

The above experiment was carried to show the disadvantage of late lambing, that is of lambs born in late April or the month of May instead of the latter part of March and early April.

This is the first year that this experiment has been carried here and no final conclusion can be made. Nevertheless the reader will note that there is a difference in favour of the group of lambs born early, of 13·7 pounds. This difference is partly explained through the fact that the ewes will produce more milk during the months of May and June and the older lambs make good use of it, and also the drying pastures will be less trying for older lambs.

Another factor against late lambing, principally for breeders of pure-bred stock to note, is that a certain percentage of the ram lambs will not be heavy enough at the breeding season to make them attractive to possible purchasers.

FIELD HUSBANDRY

The work embodied in this division has been supervised and reported by Mr. Roger P. Charbonneau, B.S.A., Assistant at this Station.

A detailed statement is given in this report, of the cost of producing farm crops in 1924 at the Experimental Station. The soil is composed of heavy clay and blue clay, the latter forming the subsoil. The work is carried with three-year, four-year and five-year rotations, and from the crops making up these very careful figures and observations are kept. On the first year of each rotation, the manure is applied at the rate of:—

15 tons per acre.....three-year rotation
20 tons per acre.....four-year rotation
25 tons per acre.....five-year rotation

the charge for manure being $2 per ton, which includes $1 per ton for applying and $1 for the net value of the manure itself.

A list of cost factors in producing crops is given below:—

COST FACTORS

Rent of land (including taxes), $125 at 6% per acre.
Use of machinery, $3 per acre.
Manual labour and teamsters, 26 and 27 cents per hour.
Horse labour, 10 cents per hour.
Threshing:—
    Wheat, 8 cents per bushel.
    Oats, 4 cents per bushel.
Ensiling, including hauling, ensiling, gasoline, depreciation of machinery and labour, $1.04 per ton.
Twine, 15 cents per pound.
Seed:—
    Corn, $2.20 per bushel.
    Sunflowers, 9 cents per pound.
    Turnips, 75 cents per pound.
    Wheat, $2 per bushel.
    Oats, 80 cents per bushel.

COST OF PRODUCING FARM CROPS

The following table presents a detailed statement of the cost of production and the yield of corn, sunflowers, swede turnips, wheat, oats, clover and timothy crops in 1924.

The corn, sunflowers and turnip crops have been grown on a three-year rotation and the remaining crops on a four-year rotation.

The reader will note a difference in the share of cost of manure, but this is due to the rate of manure applied, as already mentioned, and the distribution of the cost to the various crops in the rotation as follows:—

Three-year rotation:—	
1st year crop	50 per cent.
2nd year crop	30 "
3rd year crop	20 "
Four-year rotation:—	
1st year crop	40 per cent.
2nd year crop	30 "
3rd year crop	20 "
4th year crop	10 "

COST OF PRODUCING CROPS (PER ACRE)

Cost factors	Corn	Sunflowers	Turnips	Wheat	Oats	Clover	Timothy
Rent and taxes	$ 7 25	$ 7 25	$ 7 25	$ 7 25	$ 7 25	$ 7 25	$7 25
Share of cost of manure	15 00	15 00	15 00	12 00	12 00	8 00	4 00
Seed	1 48	0 90	1 50	3 00	2 00	1 84	1 84
Manual labour	2 60	2 60	13 52	0 52	0 52	5 20	1 82
Teamsters	5 40	5 40	8 10	4 32	4 32	2 43	1 35
Horse labour	1 00	4 00	4 10	3 20	3 20	2 00	0 90
Ensiling	16 04	12 68	.....	.....	.....	.....	.....
Threshing	.....	.....	.....	2 44	3 00	.....	.....
Machinery	3 00	3 00	3 00	3 00	3 00	3 00	3 00
Twine	.....	.....	.....	0 40	0 51	.....	.....
Total cost	$54 77	$50 83	$52 47	$36 13	$35 80	$29 72	$20 16
Yield per acre	15·42 tons	12·19 tons	24 tons	30·5 bush.	74·7 bush.	4·24 tons	2·64 tons
Cost per ton	$3 55	$4 17	$2 19	.....	.....	$7 01	$7 64
Cost per bushel, considering value of straw	.....	.....	.....	$1 05	$0 34	.....	.....

A part of the sunflower field which was destroyed by cutworms had to be resown.

DRY MATTER AND DIGESTIBLE NUTRIENTS IN FARM CROPS

The relative value of the crops as feeding stuffs is based upon the dry matter and more particularly the digestible nutrients which they contain.

The following table shows the yields of raw material, dry matter and digestible nutrients per acre. The figures are obtained from "Feeds and Feeding," latest edition, by Henry & Morrison of the University of Wisconsin.

YIELD OF RAW MATERIAL, DRY MATTER AND TOTAL DIGESTIBLE NUTRIENTS

Crop	Yield per acre	Dry matter per acre	Digestible nutrients per acre
	lbs.	lbs.	lbs.
Corn silage (immature)	30,840	6,476·4	4,101·7
Sunflowers	24,380	5,340·2	3,191·8
Swede turnips	48,000	4,564·0	3,552·0
Oats (grain only)	2,540	2,306·0	1,788·2
Clover hay	8,480	7,352·2	4,172·2
Timothy hay	5,280	4,604·2	2,692·8

"While it is possible," according to the Dominion Field Husbandman's report for 1923, "to determine accurately the cost of producing corn silage, it is not possible to calculate absolutely its value per ton. Those crops are not sold on the market and therefore have no market price and their value must be computed from feeding trials, to ascertain what profit has been made in the growing of this crop. The usual method of reckoning the value of corn silage is to estimate it at one-third the value of hay, that is, if hay is worth say $11 per ton, corn silage would be approximately $3.70 per ton."

"Roots should be regarded not as roughages, but as watered concentrates, high in available energy for the dry matter they contain." (Feeds and Feeding, page 242.)

"Roots, based on the composition of their dry matter, are more like concentrates than roughages as they are low in fibre." (Feeds and Feeding, page 12.)

According to these statements, the value of a ton of roots, in comparison with the concentrates at a market price of $37.60, which is the price used in computing the tables in this report, should be based on the percentage of digestible nutrients. Hence we take an average of 75 per cent digestible nutrients for the concentrates and 7·4 per cent for the roots and this gives us a price of $3.70 per ton of roots.*

In studying this report, there are two factors in favour of the root crops. They are better adapted to this particular district, and they are very important for the physical improvement of the soil.

For the interpretation of the following rotation tables, we are listing below the return values of the various crops which we have used:—

Wheat	$1.60 per bushel.
Oats	0.70 "
Straw—	
Wheat	$3 per ton.
Oats	$6 "
Clover	$10 "
Timothy	$11 "
Corn and sunflower silage	$3.70 per ton.
Roots	$3.70 "
Peas, oats and vetches hay	$10 "

ROTATIONS

Summary of yields, value, profit and loss, per acre:—

THREE-YEAR ROTATION (DRAINED)

Crop	Yield	Value	Cost of production	Profit or loss
		$ cts.	$ cts.	$ cts.
Corn	15·42 tons	57 05	54 77	2 28
Wheat	23·8 bush.	41 38	32 49	8 89
Clover	4·01 tons	40 10	31 50	8 60

THREE-YEAR ROTATION (DRAINED)

Turnips	24·00 tons	88 80	52 47	36 33
Wheat	23·3 bush.	40 64	32 47	8 17
Clover	4·10 tons	41 90	32 43	9 47

*This valuation for roots is higher than that given by other Dominion Experimental Farms and Stations and by the Divisions at the Central Farm, Ottawa, but subject to further tests, these figures are in use at the Ste. Anne Station.

FOUR-YEAR ROTATION (DRAINED)

Crop	Yield	Value	Cost of production	Profit or loss
		$ cts.	$ cts.	$ cts.
Sunflowers	14·91 tons	55 17	50 06	5 11
Wheat	24·3 bush.	42 63	35 55	7 08
Clover	3·39 tons	33 90	29 25	4 65
Timothy	2·60 tons	28 89	20 16	8 73

FOUR-YEAR ROTATION (UNDRAINED)

Sunflowers	13·09 tons	48 43	47 69	0 74
Wheat	30·5 bush.	53 03	36 13	16 90
Clover	4·24 tons	42 40	29 72	12 68
Timothy	2·64 tons	29 33	20 16	9 17

FOUR-YEAR ROTATION (UNDRAINED)

Corn and sunflowers	15·25 tons	56 43	50 57	5 86
O.P.V. (Silage)	7·34 tons	36 70	50 69	−13 89
Oats	74·7 bush.	62 85	37 00	25 85
Pasture	.....	5 00	13 09	−8 09

FIVE-YEAR ROTATION (UNDRAINED)

O.P.V. (hay)	3·55 tons	35 50	30 01	5 49
Turnips	17·09 tons	63 23	57 47	5 76
Wheat[1]	13·3 bush.	23 08	35 05	−11 97
Clover	2·95 tons	29 50	29 44	0 06
Timothy	2·26 tons	25 11	20 43	4 68

[1] Was partly washed out by a heavy rainfall after it was sown.

As shown in the rotation tables, all the crops were produced with profit, excepting one crop of wheat, and one crop of O.P.V. for silage. The loss recorded for the wheat crop is due to a heavy rainfall which flooded the field a few days after it was sown. The month of June being cold and dry, the yield of corn and sunflowers was poor. Nevertheless, these tables show that with good cultural methods, including proper application of barnyard manure, the farm income can be increased to a considerable extent, giving added profits to the farmer.

HORTICULTURE

ORCHARD

The damage caused to the fruit trees during the winter, by the cold weather, was not of great importance if we consider the number of trees forming our orchard, (eleven hundred) for but eight were seriously affected, and among these were three broken by snow.

The frequent rainfalls have probably affected the quality of apples, especially the fall varieties, for wintering. The fruit crop was good and the growth satisfactory.

CULTURAL EXPERIMENT

Since 1921, the orchard has been divided into three parts. 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 date as the first and is gathered around

the foot of the trees. The third part is ploughed in early spring, harrowed several times and then sown in rape in July, this crop to absorb the surplus moisture, and serve as a cover-crop. It seems that the second and last sections give the best results.

SPRAYING

The orchard was given four commercial lime-sulphur sprays with lead arsenate as insecticide. The sprayings have always been made each year at this Station and it is a marked fact that a very small proportion of the fruits are attacked by insects or fungous diseases. The time spent for spraying is largely compensated by a better yield and the quality of the fruit.

APPLE, VARIETY EXPERIMENT

The orchard is composed of 202 standard varieties of apple trees and of fifty-five seedling varieties. One hundred and twenty-three varieties originated from the orchard of the Central Experimental Farm of Ottawa. The total harvesting for 1924 was 250 barrels.

The following table gives the yield of two apple trees of ten different varieties for two years:—

Name of Variety	Year planted	Year first crop	Yield	
			bush.	gal.
Okabena	1913	1916	20	..
North Star	1915	1919	14	4
Milwaukee	1914	1919	14	1
Hyslop Crab	1913	1919	12	6
Herald	1913	1919	12	6
Lobo	1913	1919	11	2
McIntosh	1914	1919	11	2
Yellow Transparent	1913	1917	9	6
Duchess of Oldenburg	1914	1919	9	..

APPLE SEEDLINGS

Of all the seedlings which are not yet named, the most promising are those from the Langford Beauty which produced from two trees, sixty gallons of apples during a period of two years, and the winter St. Lawrence which produced from two trees and for a period of two years eighty-five gallons of apples. The fruits of these two varieties are of very good quality and can be kept until March or April.

PLUMS, VARIETY EXPERIMENT

Nineteen varieties are under test and represented by 113 trees. Most of them were planted in 1914 and 1915, therefore the yield of 300 gallons for 1924 can be considered as very satisfactory. The following varieties have given the best yield. The crop was obtained from two trees of each variety:—

	gallons	
Damson	22	
Latchford	31½	
Hudson River	25½	
Smith Orleans	25	
Green Gage	26½	
John A	19	(Yield from one tree)
Saunders	15	" "

CHERRIES, VARIETY EXPERIMENT

Of the sixteen varieties under test the Montmorency and Cerise de France are the only ones of which all the trees have produced. The biggest yield obtained from one single tree was given by the English Morello, 4 gallons. For

two consecutive years the May Duke, Brusseler Brann and Herzformige Weichsel varieties were fruitless.

PEARS, VARIETY EXPERIMENT

Eighteen pear trees representing three varieties made very good growth and were in very good condition in the Fall of 1924, except two trees of the Fremish Beauty and one of the Bartlett which were winter-killed. One tree of the Clapp Favourite which was attacked by the Fire Blight was pulled.

SMALL FRUITS

RASPBERRIES, VARIETY EXPERIMENT

Twelve varieties are under test, comprising twelve bushes planted 3 feet between the plants and 6 feet between th rows. The results for the second year are given in the following table:—

Name of Variety	Pickings		Period of production	Yield per acre
	First	Last		
			days	lbs.
Sir John	July 22	Aug. 20	29	6,160
Count	" 21	" 20	30	5,610
Shinn	" 26	" 18	23	5,500
Newman No. 24	" 23	" 26	34	5,500
Superlative	" 24	" 20	27	5,060
Latham	" 30	" 26	27	4,500
Newman No. 23	" 26	" 26	31	4,070
Brighton	" 20	" 26	27	3,630
Louboro	" 28	" 26	29	2,640
Herbert	" 26	" 20	25	1,760

RED CURRANTS, VARIETY EXPERIMENT

Six varieties are under test and represented by six trees of each variety. The distance of planting is 5 feet by 6 feet. The yield per acre for each variety is as follows:—

	lbs.
Cumberland	11,616
Knight	7,623
Loudon	5,262
Welland	4,174
Red Grape	3,751
Red Dutch	2,904

WHITE CURRANTS, VARIETY EXPERIMENT

The yield per acre for the three varieties under test was computed from the yield of six bushes:—

	lbs.
White Cherry	8,712
White Dutch	7,744
Large White	6,292

BLACK CURRANTS, VARIETY EXPERIMENT

The best yield from the varieties tested was obtained from the following. The yield is computed for an acre:—

	lbs.
Magnus	6,352
Kerry	5,980
Topsy	4,356

GOOSEBERRIES, VARIETY EXPERIMENT

The yield of the gooseberry bushes was affected by the gooseberry larva. The results for the four varieties under test per acre, are as follows:—

	lbs.
Industry	3,630
Rideau	3,025
Smith Improved	2,541
Mabel	2,278

STRAWBERRIES, VARIETY EXPERIMENT

The four varieties under test have given their first crop this year. They were planted in 1923. The yield per acre was as follows:—

	lbs.
Portia	4,554
Cassandra	3,933
Hermia	1,656
Lavinia	1,138

FLOWERS

ANNUALS, VARIETY EXPERIMENT

One hundred and sixty-five varieties of annual flowers were tested. Part of them was sown in hotbeds on April 3 and planted in the open on May 28. The balance was sown in the garden on June 3. The bad weather during the spring somewhat checked the germination of some of the seed as well as the growth of the plants.

The asters began to bloom on August 15; the zinnias on July 24; the larkspurs on July 31; and the petunias on July 12. The annual flowers by their marvellous variety of shape and colour can be grouped in very attractive schemes. Among those which should be grown in every garden we recommend the following groups:

Low plants: thlaspi, petunia, carnation, pansy, phlox, verbena and California poppy.

Medium plants: acroclinium, aster, godetia, tagetes, zinnia, scabiosa and nigella.

High plants: cosmos, everlasting, larkspur, salpiglossis, nicotiana, lupine, and helichrysum.

FLOWER BULBS, VARIETY EXPERIMENT

Fifty varieties of tulips, twelve varieties of hyacinths and ten varieties of narcissus were planted on October 20, 1923. Bulbs require much moisture to develop properly, but the soil should be well drained. The size and quality of the bulbs will greatly influence the size and quality of the flowers produced. All the tested varieties were satisfactory.

The period of flowering of a few varieties of tulips is listed in the following table:—

Name of Variety	Colour	Date of Flowering	
		From	To
Couronne d'Or, double	Yellow	May 28	June 15
Murillo, "	Blush pink	" 30	" 16
Tea Rose, "	Saffron yellow	" 30	" 16
Vuurbaak, "	Bright vermillion	" 29	" 14
P. Rauwenhof, Darwin	Light scarlet	June 8	" 29
Europe, "	Salmon scarlet	" 8	" 27
Dream, "	Lilac	" 11	" 30
Philippe Commines, Darwin	Velvety black	" 8	" 30
Psyche, "	Delicate pink	" 10	" 29
Mrs. Moon, Cottage	Yellow	" 9	" 30
Cramoisi B., Parrot	Crimson	" 12	" 30

SHRUBS

HEDGES, VARIETY EXPERIMENT

Eight varieties of ornamental shrubs were planted in hedges in the spring of 1924 and two more varieties will be added in 1925. The object is to find out the most hardy varieties, those that are best adapted to the district; and that can be pruned easily without affecting the attractiveness of the foliage. The shrubs were planted 18 inches apart. The varieties tested are:—

Berberis thunbergii
Caragana frutescens
Thurya occidentalis
Viburnum lantana
Syringa villosa
Caragana arborescens
Salix laurifolia
Native spruce.

ORNAMENTAL SHRUBS AND TREES, VARIETY EXPERIMENT

Among the varieties tested for two years, the following gave the best results by their vigorous growth and hardiness:—

Acer dassycarpum laciniatum.
Wieri,
Acer platanoides,
Ulmus americana,
Populus (Lombardy),
Aeseulus hippocastanum,
Tilia americana,
Salisburia adiantifolia,
Hydrangea paniculata,
Hydrangea arborescens,
Lonicera tatarica,
Philadelphus,
Lilac,
Spirea Van Houttei,
Viburnum lantana,
Syringa villosa.

VEGETABLES

POTATOES, VARIETY EXPERIMENT

Since 1922, five varieties have been tested and for this purpose, typical tubers of each variety were selected each year and planted in rows 66 feet long, 30 inches apart with 12 inches between the plants.

Name of Variety	Yield per acre			
	1924		1922	
	bush.	lb.	bush.	lb.
Rochester Rose	250	48	294	48
Irish Cobbler	396		308	
Early Rose	440		485	36
Green Mountain	523	36	376	4
Gold Coin	572		354	12

POTATOES, SELECTION FOR PURITY AND FREEDOM FROM DISEASE

An experiment was started in 1923 with a view to selecting pure seed free from disease. A plot comprising 200 hills was sown with Green Mountain tubers. All the diseased plants or those belonging to foreign varieties were pulled as soon as they could be distinguished.

The plot yielded 410 pounds of marketable potatoes and 60 pounds of small ones. The yield per acre was 523 bushels.

POTATOES, SPROUTED VS. UNSPROUTED

A certain quantity of Irish Cobbler seed potatoes was exposed for a period of six weeks in subdued light at a temperature varying from 40 to 50 degrees 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. The results were as follows:—

Yield from sprouted seeds..... 431 bush. 12 lb. per acre.
Yield from unsprouted seeds..... 396 bush. per acre.

POTATOES, SPROUTED VS UNSPROUTED FOR EARLINESS

The following table gives the yields and dates of harvesting:—

Name of Variety	Dates of harvesting and yield				Yield per acre	
	Aug. 2	Aug. 22	Aug. 29	Sept. 20		
	lb.	lb.	lb.	lb.	bush.	lb.
Irish Cobbler Sprouted.....	11	18	16½	32	334	24
Irish Cobbler Unsprouted.....	4½	17	17	31	303	36

POTATOES, DIFFERENT DATES OF SEEDING TO OBTAIN BEST YIELD

Last year, two varieties of potatoes, the Irish Cobbler and the Green Mountain, were planted in rows 66 feet long and 12 inches apart, at different dates, to determine the influence on yield and effect on the reproductive ability. A proportion of each planting was kept and served in this year's experiment. The results are given in the following table:—

Date of seeding	Yield of the plot				Yield per acre			
	Irish Cobbler		Green Mountain		Irish Cobbler		Green Mountain	
	Large	Small	Large	Small	bush.	lb.	bush.	lh.
	lb.	lb.	lh.	lb.				
May 28.....	75	15	101	18	396		523	36
June 8.....	72	14	93	12	378	24	484	56
June 18.....	63	8	90	17	312	24	426	48

CARROTS, VARIETY EXPERIMENT

Of the nine varieties tested, the Chantenay and the Hutchinson have given the highest yield, but the Chantenay should be preferred on account of its smoothness. The yields for a 30-foot row, 30 inches apart, follow:—

Name of Variety	Date of seeding	Ready for use	Yield
			lb.
Chantenay Selected, McD	May 10	July 20	128
Hutchinson	" 10	" 25	122
Danvers Imp	" 10	" 23	118
Chantenay, McD	" 10	" 20	114
Amsterdam	" 10	" 24	114
Chantenay O	" 10	" 20	112
Danvers	" 10	" 22	108
Ox Heart	" 10	" 28	98
Golden Ball	" 10	" 24	90

CABBAGE, VARIETY EXPERIMENT

Twenty-two varieties were tested, and the most satisfactory are among the early varieties, Golden Acre and Copenhagen. As mid-season varieties, Enkhuizen Glory and Volga; for the late varieties, Dala, Flat Dutch, Danish Stonehead are best.

The Golden Acre variety was tested for the first time this year, but it has to be mentioned for its uniformity, as the outside leaves are very few, the variety can be closely planted.

PARSNIP, VARIETY EXPERIMENT

Three varieties were under test and sown in 30-foot rows. The yields are as follows:—

Cooper's Champion	70 pounds
Hollow Crown	80 "
Hollow Crown, Ottawa	90 "

LETTUCE, VARIETY EXPERIMENT

Eighteen varieties were tested and of them we are giving below the period of production of the best varieties:—

Non-Head-forming varieties—
- Grand Rapids.....from June 17 to July 14.
- Early Curled Silesia.....from June 18 to July 18.

Head-forming varieties—
- Golden Queen.....from June 19 to July 28.

BEETS, VARIETY EXPERIMENT

The best yields obtained from the ten varieties under test are given in the following table for rows 30 feet long, 30 inches apart and 2 inches between the plants:—

Name of Variety	Date of harvesting	Yield
		lb.
Detroit Dark Red	July 27	105
Early Wonder	Aug. 2	100
Black Red Ball	Aug. 1	93
Eclipse	July 27	92
Detroit Half Long	July 31	90

DIFFERENT DATES OF SEEDING BEETS, CARROTS, PARSNIPS

The seed was sown at different dates in rows 30 feet long and 30 inches between the rows. Each plot was divided in two parts. One half was harvested at maturity and the other half when the vegetables were ready for use. In the last case, the yield was determined by number of bunches of six roots.

Name of variety	Date of seeding	Date of harvesting	Number of bunches	Per cent marketable	Yield at maturity
					lbs.
Detroit Dark Red Beet	May 7	July 28	9	90	28
	" 18	Aug. 1	11	95	21
	" 28	" 15	7	60	25
	June 11	Sept. 10	6	30	18
Chantenay Carrot	May 7	July 19	12	60	27
	" 18	" 24	13	75	30
	" 28	Aug. 18	24	96	40
	June 11	Sept. 24	8	35	29
Hollow Crown Parsnip	May 7	Sept. 6	16	92	40
	" 18	" 12	13	88	32
	" 28	" 28	11	63	28
	June 11	Oct. 2	9	43	17

ONIONS, VARIETY EXPERIMENT

Sixteen varieties were started in hotbeds on April 17 and planted on June 2 in 30-foot rows 15 inches apart and 2 inches between the plants. The varieties having given the best yield for the year are the following:—

	lbs.
Giant Yellow Prize	81
Ailsa Craig	80
Southport Yellow Globe	78
Select Wethersfield	72
Yellow Globe Danvers	70
Southport Red Globe	68
Southport White Globe	66½

NOTE.—Two varieties of onions were also sown in the open on May 17th and have yielded as follows:—

	lbs.
Yellow Globe	57
Red Wethersfield	57

PEAS, VARIETY EXPERIMENT

Of the twenty-seven varieties under test, those that have yielded the best are listed in the following table. The seed was sown in rows 30 feet long, 30 inches apart, with 1 inch between the plants.

Name of variety	Date of harvesting	Yield	Length of pod
		gals.	inches
Alaska	July 12	3½	2½
Little Marvel	" 18	5	2½
Laxton Progress	" 17	5½	3
Pioneer	" 23	4½	3½
Daisy	" 25	4½	3
McLean Advancer	" 29	4½	3½
Gradus, 0-2348	" 19	5½	3
Gradus X American Wonder, 0-3679	" 24	5	3

CORN, VARIETY EXPERIMENT

Fourteen varieties were sown on May 27 in 60-foot rows, 3 feet apart, with 18 inches between the plants.

The first varieties to mature were the Early Adams, Sixty Day, Make Good and Pickaninny, which were ready for use on August 11. The Early Malcolm variety, although maturing seven days later is superior in quality and can be recommended. The best late varieties are the Early Mayflower and the Golden Giant.

CORN, SUCKERING EXPERIMENT

The Early Malcolm and Golden Bantam varieties were used in this experiment. They were sown in hills 3 feet apart each way with an equal number of hills for each variety. The plants on one plot of each of the varieties were suckered, and the plants on the other plots were left unsuckered. The results were as follows:—

Name of variety	Ready for use	Marketable ears	Unmarketable ears
Suckered—			
Early Malcolm	Aug. 22	68	9
Golden Bantam	Sept. 3	64	8
Unsuckered—			
Early Malcolm	Aug. 29	61	24
Golden Bantam	Sept. 9	58	32

BEANS, VARIETY EXPERIMENT

Twenty-two varieties are under observation and were sown on May 20. One part was harvested when the pods were ripe and the balance was harvested when the pods were green for table use. The yield of the best varieties for a 15-foot row, 30 inches apart is given in the following table:—

Name of variety	Green pods	Matured
	gals.	lbs. ozs.
C.E.F. Homegrown Seeds—		
Masterpiece	5½	2 14
Refugee or 1000 to 1	5½	2 12
Hodson Long Pod	5	2 12
Stringless, 0-5405	4½	2 11
Challenge Black Wax	4½	2 –
Valentine Red	3½	2 2
Round Pod	3½	2 3
Plentiful French	3½	2 13
Stringless, 0-2747	3½	2 –
Bountiful	2½	2 12
Wardwell	2½	2 8
Yellow Eye	2½	2 8
Commercial Sources—		
Masterpiece	6½	3 8
Hodson Long Pod	5½	2 12
Canadian Wonder	5½	2 10
Currie Rustless	4½	2 14
Scarlet Flageolet	4½	2 6
Grennell Rustless	3	2 10
Valentine Red	3	2 8
Round Pod	3	2 10

BEANS, DISTANCE APART OF PLANTING

For this experiment the Round Pod and the Stringless Green Pod varieties were used. Three 30-foot long rows were used for each variety. In the first

row the plants were 2 inches apart, in the second row 4 inches and in the third row 6 inches. The seed was sown on May 27 and the yields are given below:—

Name of variety	Distance planted apart	First picking July 23	Green pods	Matured
	inches	gal.	gal.	lbs. ozs.
Round Pod	2	1½	6	2 13
	4	1½	4½	2 11
	6	1	3¾	2 9
Stringless	2	¼	4½	2 12
	4	¼	4½	2 9
	6	¼	3¾	2 5

TOMATOES, VARIETY EXPERIMENT

Thirty-five varieties were under test and sown in hotbeds on March 25. They were planted in the open on May 29. Seven plants of each variety were set out 4 feet apart in the rows with 3 feet between the plants. The results given below are for five plants of each of the seven earliest varieties:—

Name of variety	Date of first picking	Matured
		lbs.
Alacrity, 0-5469	Aug. 16	27
Danish Export, Ste. Anne	" 18	27½
Alacrity, 0-5467	" 21	22
Pink O	" 21	30½
Avon Early	" 22	16
Bonny Best	" 26	29½
New 50 days	" 26	26½

TOMATO, METHODS OF PRUNING TO SINGLE STEM

The variety Alacrity was started in hotbeds on March 25 and planted on May 28 in rows 24 inches apart and 12 inches between the plants. Twelve plants from each plot were pruned to a single stem not headed back, twelve plants with single stem were stopped at the third truss of fruit, twelve plants at the second truss of fruit, and twelve plants at the first truss of fruit.

The yield and date of maturity of twelve plants follow:—

Pruned to	First picking Aug. 28	Yield	
		Ripe	Green
	lbs.	lbs.	lbs.
Single stem not headed back	2	33½	31
Stopped at third truss of fruit	3	45½	22
Stopped at second truss of fruit	2½	41	18
Stopped at first truss of fruit	1¼	34½	7

SQUASH, VARIETY EXPERIMENT

Ten varieties were tested. The Golden Hubbard and the Green Hubbard were the best for both quality and yield. The Kitchenette which was tried for the first time this year has given a rather good yield but the fruits are smaller than those of the Hubbard variety.

TURNIP, VARIETY EXPERIMENT

Of the four varieties under observation, the Extra Early Purple Top Milan has given the best yield and was the earliest of all.

CUCUMBERS, VARIETY EXPERIMENT

Eleven varieties were sown on hills 6 feet apart each way and three plants on each hill. The yield of four hills for each variety is given below:—

Name of variety	Ready for use	Yield
Arlington White Spine	Aug. 11	15 doz. 9
Early fortune McD	" 8	14 " 5
Fortune Savard	" 11	12 " 4
Green Prolific	" 6	11 " 4
Early White Spine	" 8	11 " 3
Improved Green Long	" 11	11 " –
Davis Perfect	" 10	11 " –
Jersey Pickling	" 1	10 " 1
Boston Pickling	" 8	8 " 10
The Vaughan	" 15	8 " 2

RADISHES, VARIETY EXPERIMENT

Of the eleven varieties under test, the following are recommended and have given the following yields for a 30-foot row. There were twenty radishes in one bunch.

	Bunches
White Olive	23
Scarlet Olive	22
XXX Rennie Scarlet Oval	17
White Tips	16

SALSIFY, VARIETY EXPERIMENT

Two varieties were tested and gave the following yield:

	Lbs.
Sandwich Island	27
Long White	23

PARSLEY, VARIETY EXPERIMENT

Two varieties were sown on May 10 and are both very recommendable. They were ready for use as follows:—

Tripled Curled	July 15
Moss Curled	" 19

SPINACH, VARIETY EXPERIMENT

The seed was sown in rows 30 feet long, 15 inches apart, and the plants thinned to 4 inches. Of the two varieties tested, the Victoria was ready for use on June 18. The New Zealand is a later variety but gives a better yield and its period of production is much longer.

CAULIFLOWER, VARIETY EXPERIMENT

Three varieties were started in hotbeds on April 10 and planted in the garden on May 10 in 30-foot rows, 30 inches apart and 18 inches between the plants. The weight per 3 heads for each variety follows:—

Early Dwarf Erfurt	7 lbs. 9 oz.
Dry Weather	14 "
Early Snowball	7 "

CEREALS

The cereal work carried on at this Station is under the general supervision of Mr. E. L. Raynauld, B.S.A., Assistant.

The cereal work was much more satisfactory in 1924 than in previous years. The season was late, but the frequent rainfalls and the high temperature of the summer months were favourable.

The first seedings were made on May 20. The germination was delayed at the start on account of the cold weather of the later part of May. As a matter of fact, 2 degrees of frost were recorded on the 21st and 4 degrees on the 26th, with a very strong wind from the west during the entire week.

The month of June was more favourable to the growth of the plants, the temperature being milder and the rainfalls more frequent.

The weather, during July was also fair. However, we had quite heavy rainfalls which packed the soil and caused the grain to lodge and the heads of the plants that were ripe to shell.

The weather conditions during August were favourable and the harvest was begun in good condition. With the late-sown seeds, the maturing of the plants was delayed on account of the rains which continued the growth instead of ripening the grain.

On the whole, this year might be considered as a good one for cereals.

The total number of plots operated in 1924 was three hundred and sixty-two. Of these one hundred and two are the regular comparative trial plots of wheat, oats, barley, peas, beans and flax, one-sixtieth of an acre in area and made in triplicate. The remaining two hundred and sixty, are the rod-row plots consisting of rows one rod in length, and replicated four times, sown with wheat, oats and barley.

It will be noted that no comments or deductions are made on the results of the tables. The reason is that the experimental work has not been conducted for a long enough period with cereal varieties to allow decisive practical conclusions to be drawn.

COMMON SPRING WHEAT, TEST OF VARIETIES

Nine varieties were sown on May 20 in triplicate plots of one-sixtieth of an acre. The results are tabulated.

VARIETY TEST OF SPRING WHEAT

Name of Variety	Where and when obtained	Date of ripening	Number of days maturing	Average length of straw including head	Strength of straw on scale of 10 points	Tendency of heads to		Susceptibility to		Condition of stand— (thin, normal, thick, patchy)	Yield of grain per acre
						Break off— (slight, medium, bad)	Shatter— (slight, medium, bad)	Stem rust— (trace, considerable, bad)	Smut— (trace considerable, bad)		
	1924			in.							lb.
Preston	Locally	Sept. 10	113	36	9·5	.....	Slight	Trace	Bad	Normal	2,220·0
Huron Ott. 3	Ste. Anne	" 10	113	39	9·0	.....	Medium	"	Trace	"	2,120·0
Chelsea Ott. 10	Ottawa	" 4	107	34	9·5	.....	Slight	.....	.....	"	2,093·3
Early Red Fife Ott. 16	"	" 10	113	39	9·0	.....	Medium	Trace	.....	"	2,080·0
Huron Ott. 3	"	" 10	113	39	9·0	.....	"	"	.....	"	1,920·0
Ruby Ott. 623	"	Aug. 27	99	30	9·5	.....	Slight	.....	.....	"	1,920·0
Old Wheat	Locally	Sept. 10	113	34	9·5	.....	"	Trace	Bad	"	1,900·0
Marquis Ott. 15	Ste Anne	" 8	111	39	9·5	.....	Medium	.....	Trace	Thin	1,840·0
White Russian (Sel.)	Ottawa	" 11	114	36	9·0	.....	"	.....	"	Normal	1,820·0

OATS, VARIETY TESTS.—Seven varieties were sown on May 21 in triplicate plots of one-sixtieth of an acre.

Name of Variety	Where and when obtained	Date of ripening	Number of days maturing	Average length of straw including head	Strength of straw on scale of 10 points	Tendency of heads to		Susceptibility to		Condition of stand— (thin, normal thick patchy	Yield of grain per acre
						Break off— (slight, medium, bad)	Shatter— (slight, medium, bad)	Stem rust— (trace considerable, bad)	Smut— (trace considerable, bad)		
	1924			in.							lb.
Gold Rain, Swedish	Ottawa	Sept. 8	110	49	9	.....	Slight	Trace	.....	Normal	3,990·0
Banner, Ottawa 49	Ste. Anne	" 5	107	42	9	.....	"	"	.....	"	3,980·0
Victory, Swedish	Ottawa	" 8	110	38	9	.....	"	Consid.	.....	"	3,920·0
Columbian, Ott. 77	"	" 8	110	46	9	.....	"	"	.....	"	3,800·0
Banner, Ottawa 49	"	" 16	118	40	8	.....	"	Trace	.....	Thin	2,860·0
Alaska	"	" 3	105	36	9	.....	"	"	.....	"	2,760·0
Laurel, Ottawa 477	"	" 4	106	38	8	.....	"	"	.....	"	2,676·0

BARLEY, VARIETY TESTS.—Five varieties were sown on May 21, in triplicate plots of one-sixtieth of an acre.

Name of Variety	Where and when obtained	Date of ripening	Number of days maturing	Average length of straw including head	Strength of straw on scale of 10 points	Tendency of heads to		Susceptibility to		Condition of stand—(thin, normal, thick patchy	Yield of grain per acre
						Break off—(slight, medium, bad)	Shatter—(slight, medium, bad)	Stem rust—(trace, considerable, bad)	Smut—(trace, considerable, bad)		
	1924			in.							lb.
Duckbill, Ott. 57....	Ottawa	Sept. 8	110	34	9·5	Slight	Slight	.....	.....	Normal	3,640·0
Charlottetown 80....	"	" 8	110	36	9·0	Medium	"	.....	.....	"	3,600·0
Chinese, Ott. 60.....	"	Aug. 25	96	32	9·0	Slight	"	Trace	Trace	"	3,240·0
O.A.C. 21.....	"	" 25	96	32	9·0	.....	"	"	"	"	3,200·0
Himalayan, Ott. 59..	"	" 23	94	24	8·0	Bad	Medium	.....	.....	"	2,893·3

PEAS, VARIETY TESTS

Four varieties were sown on May 21 in duplicate plots of one-sixtieth of an acre

Name of Variety	Date of sowing	Date of ripening	Number of days maturing	Average length of plant	Actual yield of seed per acre	Stand
				in.	pounds	
Golden Vine, Sask. 625	May 21	Sept. 8	110	54	3,840	Normal.
Arthur, Ott. 18	" 21	" 8	110	60	3,270	"
Champlain, Ott. 32	" 21	" 6	108	48	3,090	"
Chancellor, Ott. 26	" 21	" 6	108	50	2,790	"

BEANS, VARIETY TESTS

Five varieties were sown on May 26 in single rows 60 feet long, 24 inches apart and thinned to 4 inches between the plants. Owing to the lack of available land, only one row could be sown for each variety

Name of Variety	Date of sowing	Date of ripening	Number of days maturing	Average length of plants	Actual yield of seed per acre	Stand
				in.	pounds	
Navy, Ott. 711	May 26	Sept. 14	111	16	1,488·2	Normal.
Yellow Six Weeks	" 26	" 16	113	14	1,415·7	"
Norwegian, Ott. 710	" 26	" 8	105	14	1,379·4	"
Beauty, Ott. 712	" 26	" 12	109	10	1,089·0	"
Large White, Ott. 713	" 26	" 18	115	16	744·1	"

FLAX, VARIETY TESTS

Four varieties were sown on May 21 in duplicate plots of one-sixtieth of an acre

Name of Variety	Date of sowing	Date of ripening	Number of days maturing	Average length of plants	Strength of straw on a scale of 10 points	Actual yield of seed per acre	Stand
				in.		pounds	
Premost	May 21	Sept. 22	124	22	9·5	1,332	Normal.
Longstem, Ott. 52	" 21	" 24	126	26	8·5	1,152	"
Blanc, Ott. 62	" 21	" 22	124	18	9·5	942	"
Kostroma	" 21	" 26	128	26	8·0	822	"

FORAGE CROPS

Experimental work with clovers, grasses and forage crops, was started on a fairly large scale this year, and in the fall the appearance of the clovers and grasses was quite good on most of the plots.

Variety tests with corn, sunflowers, mangels, sugar beets, swede turnips and carrots were continued on a larger scale than the previous years and the crops obtained were good.

The corn and sunflowers were replicated four times and planted in rows 36 inches apart with 7 inches between the plants. The roots were replicated five times and sown in rows 30 inches apart with 8 inches between the plants, excepting the carrots which were thinned to 4 inches.

CORN, VARIETY TESTS

Twenty-three varieties were sown on June 6 and harvested on October 8, and gave the following results:—

VARIETY TEST OF CORN

Name of Variety	Source	Yield per acre		Stage of maturity
		tons	lbs.	
Hybrid	Wimple	15	1,883	Late milk
North Dakota	Steele Briggs	13	1,467	Milk
Burr Leaming	Carter	13	862	Ears forming
Leaming	Parks	12	1,773	Milk
Longfellow	Dakota Imp. Seed Co...	12	1,350	Ears formed
Wisconsin No. 7	Duke	12	1,350	Ears forming
Golden Glow	"	12	563	Milk
Compton's Early	"	11	1,776	Firm dough
Wisconsin No. 7	Parks	11	869	Ears forming
North Western Red Dent	Dakota Imp. Seed Co...	11	264	Firm dough
Yellow Dent	Wimple	11	143	Milk
Leaming	Duke	10	1,115	Milk
Northwestern Dent (Nebraska Grown)	A. E. McKenzie	10	1,054	Milk
Northwestern Dent (N. Dakota Grown)	"	10	812	Milk
90 Day White Dent	Dakota Imp. Seed Co...	10	752	Late milk
Longfellow	Duke	10	328	Ears formed
Pride Yellow Dent	Dakota Imp. Seed Co...	10	147	Late milk
Bailey	Duke	10	26	Ears forming
White Cap Yellow Dent	Steele Briggs	9	1,905	Milk
Northwestern Dent	E. F. Brandon	9	1,784	Glazed, few ears ripe
Quebec No. 28	McD. College	8	1,243	Glazed, few ears ripe
Amber Flint	Wimple	8	517	Glazed, few ears ripe
Twitchell's Pride	E. F. Fredericton	7	1,609	Late milk

SUNFLOWERS, VARIETY TESTS

Eight varieties were sown on June 6 and harvested as far as possible when the plants were in the right stage of maturity for making best quality silage, that is, when about 40 per cent of the heads were in bloom. The results are given in the following table:—

VARIETY TEST OF SUNFLOWERS

Name of Variety	Source	Yield	
		tons	lbs.
Black	C.P.R.	22	105
Manchurian	"	18	1,510
Mammoth Russian	"	18	966
Mixed Mennonite	"	17	485
Manchurian	McKenzie	16	1,941
Manteca	C.P.R.	16	791
Mammoth Russian	Kenneth McDonald	15	674
Mennonite	Rosthern	10	1,962

MANGELS, VARIETY TESTS

Thirty-three varieties were tested. They were sown on May 23 or 24 and harvested on October 15 or 16. The roots have been weighed and the off-types in each variety counted, in order to be able to give the percentage of roots belonging to the type of the varieties tested.

VARIETY TEST OF MANGELS

Variety	Source	Yield	
		tons	lbs.
Stryno Barres	Hartman	19	1,368
Fjerritslev Barres	"	19	494
Yellow Intermediate	Ottawa	18	421
Rosted Barres	Hartman	17	1,944
Half Sugar Danish	Ste. Anne	17	560
Sludstrup Barres	Hartman	16	1,869
Taarocj Barres	"	16	1,531
White Red Top Half Sugar	"	15	1,835
Svalof Alpha White	G. Swedish	15	1,426
White Green Top Half Sugar	Hartman	15	1,144
Half Sugar White	D. & F.	15	872
Barres Sludstrup	G. Swedish	15	673
Svalof Alpha Red	"	15	189
Giant Sugar	Rennie	14	1,947
Géante Blanche de Vauriac	Savard	13	136
Danish Sludstrup	D. & F.	13	77
Danish Improved	"	8	1,719
Echendorffer Yellow	Hartman	18	1,761
Imp. Tankard Cream	Rennie	18	1,128
Echendorffer Red	Hartman	18	310
Ideal	Rennie	17	1,090
Echendorffer Red	G. Swedish	17	673
Echendorffer Yellow	"	17	493
Golden Tankard	D. & F.	13	1,568
Golden Tankard	Rennie	11	1,390
Perfection Mammoth Long Red	"	17	1,312
Elevetham Mammoth	"	17	442
Imp. Mammoth Long Red	D. & F.	16	1,457
Long Yellow	"	10	1,838
Yellow Globe Giant	Rennie	17	830
Yellow Globe	D. & F.	17	380
Barres Oval	G. Swedish	15	860
Barres Half Long	"	16	1,210

SUGAR BEETS, VARIETY TESTS

Eight varieties were tested and sown on May 26 at a distance of 7 inches between the plants and 30 inches between the rows. The crop was harvested on October 20, yielding as follows:—

SUGAR BEETS

Variety	Source	Yield per acre	
		tons	lbs.
Dr. Burgman	Dominion Sugar Co.	10	618
Horning	"	10	581
Dippe	"	10	531
Henning & Harving	"	9	1,982
Kitchener	"	9	1,013
Vilmorin's Improved	Vilmorin Andrieux & Sons	9	366
Schreiber	Dominion Sugar Co.	9	135
Sluice Bros	"	6	757

The chemical analysis was made by the Chemistry Division at the Central Experimental Farm, of a dozen representative roots of each variety, and the results are tabulated:—

ANALYSIS OF SUGAR BEETS

Variety	Weight per Root	Sugar in Juice	Coefficient of Purity	Remarks
	lb. oz.	%	%	
Horning	1 11	19·63	84·74	Not very good shape
Kitchener	1 7	20·08	87·46	Fair shape
Sluice Bros	1 3	20·04	84·96	"
Schreiber	1 1	20·83	86·92	Fairly good shape
Vilmorin's	1 5	19·41	83·71	" "
Dieppe	1 14	18·24	81·51	Good shape
Henning & Harving	1 12	18·59	82·43	Fair shape
Burgman	1 7	20·95	86·66	Fairly good shape

TURNIPS, VARIETY TESTS

Twenty-nine varieties of Swede and Fall turnips were sown on May 23 and 24, and the crop harvested on October 17 and 18. The yields obtained are given in the table following:—

VARIETY TEST OF TURNIPS

Variety	Source	Yield	
		tons	lbs.
*Yellow Tankard B.L	Roskilde	22	1,830
Shepherd's Golden Globe	Hartman	20	1,912
*Bartfelder Swede	"	20	421
Invicta	Rennie	19	448
Fynsk Bortfelder	Roskilde	18	1,836
Ditmars	McNutt	18	1,791
Bangholm 1116	Trifolium	18	1,524
*Dalis B.L	Roskilde	18	1,183
Shepherd's Swede	Trifolium	18	995
Prize Purple Top	Rennie	18	719
Olsgard Bangholm Swede	Hartman	17	1,822
Hartley's Bronze Top	Rennie	17	172
Ne Plus Ultra	D. & F	16	1,493
Magnum Bonum	Rennie	16	1,351
Bangholm Purple Top	"	16	1,010
Elephant	D. & F	16	350
Best of All	Rennie	16	167
Bangholm	G. Swedish	15	1,983
Bangholm	D. & F	15	668
Kangaroo	"	15	550
Bangholm	Nappan	15	256
Sutton Champion Purple Top	D. & F	14	1,995
Perfection	"	14	1,796
Imp. Yellow Swede	G. Swedish	14	1,801
Kangaroo Bronze Green Top	Rennie	14	359
Improved Jumbo	"	13	1,709
Canadian Gem	"	13	749
Shirvings	K. McD	11	1,754
Good Luck	Ste. Anne	11	270

* Fall turnips.

CARROTS, VARIETY TESTS

Thirteen varieties were sown on May 24 and harvested on October 28. The results follow:—

VARIETY TEST OF CARROTS

Variety	Source	Yield	
		tons	lbs.
Imp. Intermediate White	D. & F.	15	1,596
Mammoth Short White	Rennie	15	1,080
Large White Belgian	"	15	620
White Belgian	Trifolium	14	1,918
White Belgian	D. & F.	13	610
White Belgian	Hartman	12	1,247
Champion	"	12	713
Danish Champion	Ottawa	11	1,754
Champion	G. Swedish	11	1,706
Mammoth Intermediate White	Rennie	11	1,586
Half Long White	G. Swedish	10	1,954
Large White Vosges	D. & F.	10	1,477
James B.L.	G. Swedish	9	736

POULTRY

Our poultry division has continued to make progress during the year. The spring and summer were favourable to poultry breeders and the death rate due to sickness during the winter was the lowest recorded to date.

The poultry flock was composed, on November 1, of the following: 56 Barred Plymouth Rock hens, 185 Barred Plymouth Rock pullets, 72 Barred Plymouth Rock male birds.

The demand for well-bred male birds was such during the fall, and winter, that only part of the orders could be filled. The same can be said for hatching eggs and day old chicks.

RATE AND COST OF GROWTH IN REARING CHICKS *(Project No. P. 28)*

From hatching date until they were placed in winter quarters, the chicks were weighed periodically and the cost of feed consumed recorded. At the end of the experiment, 340 chicks were still alive.

The feed consumed consisted of a home-mixed grain ration, dry mash, rolled oats, eggs, skim-milk, charcoal, grit, oyster shells and greens (sprouted oats), which were kept constantly before the birds. Unfertile eggs taken from the incubator were boiled and served during a week at the rate of one egg per pound of mash, which was composed of equal parts of corn meal, shorts, sifted oat meal and meat meal. The mixed grains fed in the litter consisted of equal parts by weight of wheat, cracked corn and oats.

This experiment was carried from April 5 to September 26 or a period of 26 weeks. When hatched the chicks weighed an average of 2 ounces each; at the end of the first month, ¾ pound each; at the end of two months, 1½ pounds; at the end of three months, 2¾ pounds, and at the end of the 26th week, 3.88 pounds each. The total detailed cost of bringing them to the 26th week is stated in the following table:—

Feed	Quantity consumed	Cost	Total cost
		$ cts.	$ cts.
Grain	3,336 lbs.	1 65 per 100 lbs.	55 04
Mash	3,483 "	2 25 "	78 36
Bran	95 "	1 22 "	1 15
Rolled oats	60 "	7 00 "	4 20
Sprouted oats	30 "	0 50 "	0 15
Grit	17 "	1 25 "	0 21
Oyster shells	17 "	1 26 "	0 22
Charcoal	12 "	5 00 "	0 60
Milk	2,650 "	0 30 "	7 95
Eggs	15doz.	0 20 doz.	3 00

Weight when hatched	42·5 lbs.
No. of chicks at end of experiment	340
Total weight at end of experiment	1,320 lbs.
Average weight at end of experiment	3·88 "
Total cost of feed	$ 150.88
Cost for 1 lb. gain	11·4 cts.

METHODS AND RATIONS FOR FATTENING AND FINISHING ROASTERS

(Project No. P. 42)

For the purpose of this experiment, 50 Barred Plymouth Rock cockerels were divided into two groups of 25 each and placed in fattening crates. The experiment began on August 26 and lasted until September 16, covering a period of three weeks. The birds were fed twice a day for the first two weeks and three times a day during the third week.

One group was fed commercial feed and the other group a home-mixed mash composed as follows: One part, by weight of corn meal, one part oat meal, one part middlings and 15 per cent beef scrap. Each mash mixture was moistened with skim-milk at the rate of 2 pounds of milk to one of mash.

The results which are embodied in the table following show that the group fed the home-mixed mash made greater and cheaper gains, than the birds given the commercial ration:—

Group No.	Initial weight	Feed consumed		Finished weight	Increase	Value	Cost of feed	Profit
		Mash	Skim-milk					
	lbs.	lbs.	lbs.	lbs.	lbs.	$ cts.	$ cts.	$ cts.
1	60	36	62	84	24	6 00	1 38	4 62
2	70	32	70	105	35	8 75	0 94	7 81

Group No. 1 was fed the commercial ration and group No. 2, the home-mixed ration.

PEDIGREE BREEDING FOR EGG PRODUCTION *(Project No. P. 56)*

For this experiment, all the birds are trap-nested and the best layers are mated with male birds whose dams and granddams have high records. Following are the results for the fifteen best pullets for two years:—

Year	Number of birds	Total eggs laid	Ave. eggs per bird
1923	15	1,354	123·6
1924	15	2,297	153·1

In following this recommended system of breeding, an increase of 29.5 eggs per bird was obtained and this increase is more than sufficient to warrant the purchase and use of a male bird of quality, even in relatively small flocks.

PULLETS VS HENS FOR EGG PRODUCTION *(Project No. P. 60)*

The object of this experiment is to determine and compare the value of pullets and hens for the production of eggs. Two groups of 10 birds each were used and the cost of feed and value of eggs sold recorded, giving the results tabulated:—

Group No.	Number of birds	Cost of feed	Total eggs laid	Value	Profit
		$ cts.		$ cts.	$ cts.
1	10 pullets	19 05	1,371	39 65	20 60
2	10 hens	21 86	1,108	32 04	10 18

The cost to feed the pullets was $2.81 less than for the hens, while they laid 263 more eggs than the group of hens, giving a profit of $10.42 in favour of the pullets or an average profit of $2.06 per bird; that for the second group is $1.01 per bird.

COSTS OF EGG PRODUCTION *(Project No. P. 62)*

The object of this project is to ascertain the feed cost of producing eggs during the different periods of the year and also the possible profits to be obtained and the number of eggs required to pay for the necessary feed both for the winter months and also for the entire year. Consequently it is divided into several sub-sections as follows:—

(a) *Costs and Profits by Periods.*—This experiment was conducted with fifty well-bred Barred Rock pullets and lasted for a year, beginning on November 1 and ending on October 31, to determine what is the best period of the year to produce eggs.

The birds were fed a standard grain ration composed of oats, wheat and corn. They had dry mash in hoppers at will and were supplied with greens, grit, etc.

The results for a year divided in three periods are given in the following table:—

Period	Number of birds	Cost of feed	Eggs produced	Value	Profit
		$ cts.		$ cts.	$ cts.
Nov. 1 to Feb. 29	50	47 29	1,862	113 11	65 82
March 1 to June 30	50	26 92	2,443	57 80	30 88
July 1 to October 31	50	26 54	2,770	72 51	45 97

The first period covering the winter months is the time of the year to obtain the greatest profits, provided the birds lay reasonably well, as it is the season when the eggs are sold for the highest price. Increasing the winter egg production also means a greater profit for the year. This first trial also indicates that reasonable profit over the cost of feed can be made if the birds are well bred and well fed. The average production per bird during the year was 141 eggs at an average cost of 17 cents per dozen giving an average profit of $2.85 per bird over the cost of feed.

The foregoing results were used to determine the cost of eggs per dozen per period.

The eggs produced during the first period cost 30.4 cents a dozen; during the second period 13.2 cents a dozen and during the third period, 11.4 cents a dozen.

As can be readily understood, the cost of production and profit per dozen were higher during the first period, mainly on account of the generally prevailing high prices of eggs at that particular date. The same explanation holds for the last period and this always brings up the question of early production if we wish to obtain maximum returns.

(*b*) *Winter months.*—This part of the experiment is to determine if the production of eggs during the winter months is advantageous. The cost of feed, the number of eggs laid and the selling price are recorded. The twenty-four birds used were fed a standard ration.

Month	Feed cost	Eggs produced	Value	Profit over feed cost	Cost per dozen
	$ cts.		$ cts.	$ cts.	cts.
November	4 11	309	12 36	8 25	13·3
December	4 12	203	17 58	13 46	14·0
January	4 70	152	7 60	2 90	30·9
February	3 92	204	8 16	4 24	19·2

It will be noted that the best profit was made in December when the eggs brought the highest returns. This experiment illustrates the importance of hatching the pullets early in order to be able to develop the birds so that they start laying in November and December when the eggs obtain a high price on the market.

(*c*) *Entire year.*—This part of the experiment is to determine the cost of egg production during a whole year. Records were kept of the feed cost and eggs produced and are tabulated:—

Month	Number of birds	Cost of feed	Eggs produced	Value
		$ cts.		$ cts.
Nov	20	4 78	176	8 80
Dec	20	4 22	218	16 35
Jan	20	4 76	222	12 95
Feb	20	4 38	144	7 20
March	20	3 61	220	8 80
April	20	3 19	224	4 48
May	20	1 79	246	4 92
June	20	1 81	239	4 78
July	20	2 07	261	5 22
Aug	20	2 05	242	4 84
Sept	20	2 46	223	5 58
Oct	20	3 91	315	11 25

This table shows again that the best time for egg production is the month of December when they have much more value than in any other time.

(*d*) *By Breeds.*—This part of the experiment is to determine what breed of poultry is the most economical to keep. For this purpose three groups of ten birds each of three different breeds, namely Rhode Island Reds, Barred Plymouth Rocks and White Leghorns, were used. For a whole year, record was kept of the cost of feed and eggs produced. The birds were fed a standard

ration and given every possible care throughout the period. The results are tabulated below:—

Breed	Number of birds	Cost of feed	Eggs produced	Value	Profit
		$ cts.		$ cts.	$ cts.
Rhode Island Reds	10	20 65	1,752	62 49	41 84
Barred Plymouth Rocks	10	21 64	1,896	67 77	46 13
White Leghorns	10	20 34	2,002	61 23	40 89

While the White Leghorns laid the largest number of eggs, they gave the smallest profit. This is explained by the fact that the Rhode Island Reds and Barred Plymouth Rocks laid more eggs during the winter months when the market for eggs is the best. Of the three groups, although they are fairly close, the Plymouth Rocks lead by a margin of $5.24 of profit for the year.

(*e*) *Eggs Required to Pay for Winter Feed.*—This part of the experiment is to determine the number of eggs required to pay for the winter's feed. A group of twenty-four Barred Rocks was used and the records are here tabulated:—

Month	Number of birds	Cost of feed	Eggs produced	Value	Cost per dozen
		$ cts.		$ cts.	cts.
November	24	4 11	309	12 36	15
December	24	4 12	293	17 58	16
January	24	4 70	152	7 60	37
February	24	3 92	204	8 16	23
Totals	24	16 85	958	45 70	21

The number of eggs required to pay for the feed for 24 birds during the winter months was 353.

(*f*) *Eggs Required to Pay for Year's Feed.*—This part of the experiment is to determine what is the number of eggs required to pay for a year's feed. Barred Plymouth Rock birds were used and fed a standard ration for a whole year with records kept of feed cost and eggs laid.

Month	Number of birds	Cost of feed	Eggs produced	Value	Cost per dozen
		$ cts.		$ cts.	cts.
November	20	4 78	176	8 80	31
December	20	4 22	218	16 35	23
January	20	4 76	222	12 95	25
February	20	4 38	144	7 20	36
March	20	3 61	220	8 80	19
April	20	3 19	224	4 48	17
May	20	1 79	246	4 92	08
June	20	1 81	289	4 78	09
July	20	2 07	261	5 22	09
August	20	2 05	242	4 84	10
September	20	2 46	223	5 58	13
October	20	3 91	315	11 25	14
Totals	20	39 03	2,730	95 17	17

The total cost of feed for twenty birds during one pear was $39.03 and the egg production was 2,730 valued at $95.17. Hence, the required number of eggs a bird should produce to cover the feed cost, is 54.8 during a year.

EGG-LAYING CONTEST *(Project No. P. 64)*

The egg-laying contests, established in 1919, are one of the means by which Canadian poultry is being improved through better breeding, increased production and registration. The contests offer good breeders the opportunity of demonstrating the productive qualities of their birds and thus making known the best sources from which breeding stock and hatching eggs may be obtained.

While the contest held at this Station is only in its third year, the following information is surely interesting to poultry breeders:—

Year	Number of birds	Eggs laid	Net profit over cost of feed	Cost per dozen
			$ cts.	cts.
1922-23	120	13,506	137 16	22·5
1923-24	170	23,473	452 61	17·3

Average egg production per bird in 1922-23	112
" " " 1923-24	138
Increase in egg production per bird	26

GENERAL

In addition to the projects already listed, experiments are also being conducted to determine the best make of incubator; the best date for incubation; the relative value of corn and barley for feeding poultry; the relative values of skim-milk, beef scrap and meat as sources of animal protein; the relative values of mangels, clover leaves sprouted oats and Epsom salts; the relative advantages of breeding from hens and from pullets for fertility; the best method to adopt for improving the poultry of the district served by this Station. The results obtained to date have not been at all conclusive and consequently fuller details will be given only when more definite data have been obtained.

APICULTURE

This is the first year since 1920 that the weather was fair for bee-keeping in this district and the honey crop satisfactory.

The winter of 1923-24 was favourable for wintering, and of the forty-six colonies placed in winter quarters, only one died outright. The average quantity of honey consumed per colony was only 9¼ pounds.

Of the forty-six colonies, thirty-eight were wintered in the cellar and eight colonies were wintered in cases out-of-doors, four-colony cases.

The temperature of the cellar varied from 41 to 48 degrees F., and humidity from 36 to 38 degrees. One colony was kept on a scale and an average decrease of 2 pounds per month was registered. When taken out in the spring, the colonies had an average of five to six frames covered with bees and enough honey for their feeding to await the dandelion crop.

The colonies wintered in cases wintered well as they were well protected from the bad weather, and when taken out gained more strength than those wintered in the cellar.

Of the colonies wintered in cellar one was lost and five were queenless. Of these, three had to be united and the two remaining were strong enough to raise a queen by themselves.

It was found in two of the hives wintered in cases that the queen was producing drones only and for this reason they had to be united.

The month of May was cold and this checked the development of brood. The bees gathered but little nectar and pollen and had to be fed artificially until June. From June 9, the bees gathered enough nectar to maintain themselves and from June 23 to August 2, the honey crop was harvested. The highest crop gathered by the hive on scales during one day, was 7¼ pounds. The first pollen was gathered on April 26 and nectar on willows May 4, on dandelions May 28 and on fruit trees June 3.

The colonies that were wintered in cases produced an average of 75 pounds of honey per colony and those wintered in cellar, an average of 47 pounds. One colony of the first group was divided during the summer and the second group produced three swarms.

On June 1, after the weak colonies were put together or united to others, we had a total of forty colonies. We had but a few swarms and we endeavoured to choose the best brooding hives so as to rear queens for 1925. Fifteen colonies swarmed, five were divided and six were formed with nucleii.

CONTROL OF SWARMING BY DEQUEENING AND REQUEENING

By this system, the queen is killed at the first appearance of larvae in queen cells and the cells removed. After nine days, the royal cells are again destroyed and a young queen introduced. Two hives were used in this experiment. One was successfully controlled and the other swarmed during the latter part of August.

CONTROL OF SWARMING BY SEPARATION OF BROOD AND QUEEN

Procedure (*a*): At the first appearance of eggs in the royal cells, the cells are destroyed, the frames covered with brood are placed in the upper super, and the brood chambers refilled with new dry frames, after which the queen and the bees were shaken down on these new frames. Then a queen excluder is placed between the brood chamber and the super to prevent the queen from reaching the frames covered with brood.

Of the two colonies used in this experiment, one swarmed and the other was prevented from swarming.

Procedure (*b*): Two colonies are used in this experiment. One frame covered with brood with the queen is placed in a super and the balance of the super is filled with dry frames. All the royal cells are destroyed and a queen excluder placed between this upper super and the hive. Nine days later the royal cells are again destroyed and a fecunded queen introduced into the hive (if not available a royal cell can be left at the second inspection). As soon as the queen begins to lay, the colony is divided. The super containing the original queen is placed on a new stand.

This system was very successful in preventing natural swarming while obtaining a new colony.

METHOD OF DETECTING PREPARATIONS FOR SWARMING

Eight colonies were used in this experiment. To each colony a half super was added to facilitate the detection of royal cells and preparation of swarming each time the colony was inspected. The results are as follows:—

Colony No.	Number of royal cells in the lower part of the half super	Number of royal cells in the brood chamber
29	1	3
33	7	4
40	5	4
50	1	7
19	6	.....
1	.....	7
26	6	.....
34	2	.....

NOTE:—It will be noted that queen cells were built in the supers of all colonies except No. 1, therefore, preparations for swarming could be detected by merely tipping the supers. In No. 1, cells were built in the lower brood chamber only, but these were undoubtedly supersedure cells.

WINTERING BEES IN CELLAR

Thirty-eight colonies were wintered in the cellar of the beeman's house, where a temperature of 41 to 48 degrees F. was maintained, and about 36 to 38 degrees of humidity. The walls are made of stone with a wooden partition and a concrete floor. There is no ventilating system but once a week, the door leading to the main cellar was opened to change the atmosphere and twice per month the dead bees were swept away.

When the colonies were taken out on April 28, one colony was dead, and five were queenless. Three of them were united and the two others were strong enough to rear a queen by themselves. The balance of the colonies had from five to six frames covered with bees and a good supply of honey left.

WINTERING BEES IN FOUR-COLONY CASES

In the fall, four colonies were placed in a case for the winter. Two had their entrances facing the northeast, and the two others, facing the southwest, the four set back to back. The case was large enough to allow a space of over six inches all around to be packed with shavings in bags, as well as on the top.

All the colonies wintered well, but in the spring it was found that one of them produced drones only. The three other colonies produced the following honey crops:—

Hive No. 10	122 lbs.
Hive No. 16	62 "
Hive No. 34	68 "

RETURNS FROM APIARY

In the fall of 1923, ten colonies were set aside as a commercial apiary to determine if there is profit or loss in producing honey. The ten colonies wintered well and were set out in the spring for their year's work. The particulars are as follows:—

Colony No.	Honey harvested	Multiplication
	lbs.	
2	125	.....
3	50	Swarmed
5	112	.....
8	30	.....
18	57	.....
19	70	Swarmed
26	50	Divided
29	67	Divided
31	63	Swarmed
40	55	Swarmed

NOTE.—Colonies Nos. 29-33-40 and 1, have swarmed, and from this year's experiment it would appear that swarming could be controlled to a certain extent.

At the close of the year, the ten colonies had produced 679 pounds of honey or 67.9 pounds per colony. Besides there was an increase of six colonies. Hence, sixteen colonies were placed in winter quarters at the close of the season.

The financial statement for the ten colonies is given below:—

To Revenue:			
679 lbs. honey at 18 cts. per lb.	$	122 22	
4 lbs. wax at 40 cts. per lb.		1 60	
6 new colonies at $7 each		42 00	
			$ 165 82
By Expenses:			
Interest at 6% on investment ($300)	$	18 00	
Value of honey and sugar consumed		22 00	
128 hrs. labour at 35 cts. per hour		44 80	
			$ 84 80
By: Profit balance			81 02
Profit per colony			8 10

STUDY OF HONEY FLOWS

For the purpose of this experiment two hives were placed on individual scales in the spring. As soon as the honey-flow started, hourly records were kept, from 6 a.m. to 7 p.m., of the weight of hive, temperature, and wind.

From this first year's observation, it was noted that there was no increase in weight until 12 a.m.; very slight increase from 12 a.m. to 2 p.m.; increase from 2 p.m. to 4 p.m.; increase reaching maximum from 4 p.m. to 5 p.m.

When the weather is dry during the honey-flow season, the bees gather nectar on sunless days. The increase is also larger after a rainy day, but strong wind will affect the work of the bees. Winds from the south were not favourable for the gathering of pollen. The greatest increase was recorded on days when the wind was southwest or northeast.

QUEEN REARING

Twenty queens were reared through the grafting method, this year. Royal cells from pure and good-laying strains of Italian bees are taken from a hive that has swarmed and are grafted on a frame containing young brood. For this purpose, eight-frame hives were used and subdivided into three compartments with entrances in different directions. In each of the compartments was placed one frame of capped brood covered with bees, and the royal cell was grafted on this frame. Another frame containing a little honey was added and the entrances to the compartments closed with moist moss. The nucleii was then placed in the shade for a period of forty-eight hours, after which it was set on its permanent stand outside of the apiary, and the entrances were opened. By placing the nucleii outside the apiary, it reduces the possible loss of the queens in their mating flight.

INTRODUCTION OF QUEENS

The queens were introduced into the hives through the Miller cage (which is of simple construction). One end of the cage is closed with a sweet paste made of sugar and best quality honey. The queen is placed alone in the cage, which is set between two frames.

All the queens introduced in the hives by this method were accepted.

A certain number of queens received from outside sources were introduced through the shipping cages, but it was found that the paste became too hard and the queens were not liberated quickly enough, and many of them died before they were set free.

We also introduced queens through the smoking method, whenever the other systems failed. The bees are first thoroughly smoked. The queen is then placed at the entrance of the hive and driven in by light smoking.

This method causes much disturbance in the hive and is not so satisfactory as the others and should be practised only when the others fail to succeed.

FIBRE DIVISION

To determine the best variety of flax to grow for fibre as well as the most desirable date of seeding, a series of tests was carried out. The results for this year are given in the following table:—

—	Pure Line No. 5	Long-stem	Saginaw	Riga Blue 1st sowing	Riga Blue 2nd sowing	Riga Blue 3rd sowing	Riga Blue 4th sowing
Size of plots (acres)	·025	·025	·025	·017	·015	·017	·025
Date of seeding	May 21	May 21	May 21	May 21	May 28	June 4	June 11
Date of pulling	Aug. 22	Aug. 22	Aug. 22	Aug. 23	Aug. 23	Sept. 12	Sept. 12
No. days maturing	93	93	93	94	87	100	93
Average length of straw (inches)	22	26	24	24	26	34	36
Green weight of straw (Lbs.)	137·8	255·5	142·1	120·6	126·3	167·6	230·0
Weight of straw before threshing (Lbs)	65·3	81·3	79·3	61·6	56·6	80·6	100·0
Weight of straw after threshing (Lbs.)	39·6	52·3	49·6	37·6	35·3	55·3	70·0
Weight of seed after cleaning (Lbs.)	17·5	26·5	15·0	12·0	12·6	9·2	9·5
Weight of fibre (Lbs.)	6·0	6·8	6·5	4·0	2·66	6·0	7·3
Yield of fibre per acre (Lbs.)	240·0	272·0	260·0	235·3	177·3	352·9	292·0
Yield of seed per acre (Lbs.)	700·0	1,060·0	600·0	705·8	840·0	541·0	380·0

DEVELOPING THE FLAX INDUSTRY

The Station staff gave much time to an attempt at reviving the flax industry in the locality. Several meetings were held, and flax seed of quality distributed in co-operation with the Provincial Department of Agriculture. In the fall, a scutching machine was installed and nearly 400 farmers came to have their flax scutched here. A few years of such work will prove whether or not it is possible to make flax-growing in this valley a successful commercial venture.

ILLUSTRATION STATIONS

The number of Stations was maintained at eighteen during the year and investigations were made towards the establishment of three new ones.

Since 1922, the Illustration Station work has received much thought and time from the superintendent and with the assistance of the supervisor and chief supervisor. Many new lines of work have been started, details concerning them will be found in the separate report of the Illustration Stations, which can be obtained from the Publications Branch, Department of Agriculture, Ottawa. But, the reader will be interested to know that the aim of those sub-stations is to make centres for the production of such things as good seed and well-bred poultry, and efforts are made to grow crops that will increase the milk production of dairy herd while reducing the cost of production. Monthly milk records are kept at each Station. The average production per cow for all Stations in 1924, was 5,245 pounds of milk. The average for the best herd was 7,967 pounds of milk and the average of the lowest was 3,156 pounds of milk per cow. This in itself, shows that there are possibilities for improvement work on the Stations proper and in the districts where they are located.

The operators of these Stations report the visits they receive from surrounding farmers, and their increasing sales of good seed. It is also a fact that the methods of work followed on the Illustration Stations are being adopted gradually by the farmers in the neighbouring districts.

GENERAL NOTES

EXHIBITIONS.—An educational agricultural exhibit was installed at the Montmagny, St. Pascal, Isle-Verte, Rimouski and Notre-Dame du Lac fairs. A collection of Percherons was also sent to the St. Pascal show and to the annual Percheron show of Ste. Anne de la Pocatière, where they obtained most of the first prizes. Much useful information on agriculture is given and publications distributed through the medium of these exhibitions. The superintendent and his assistants were also called to act as judges at many of the local fairs including the Three Rivers and the Quebec shows.

Visitors coming to see our Station have greatly increased in number during the year, and the work carried here has received a still greater attention through the inauguration of a series of special days, as follows: an official agronomists' day, a bee day, a poultry day, two general farmers' days, a live stock breeders' day, two farm women's club days and one flax day. Through the holding of those days, nearly two thousand people had the opportunity of observing several phases of our work.

We were also favoured with a visit from the International Bee Congress delegates who came from Quebec to see our apiary. The delegates were from European countries, United States and Canada.

OTTAWA: Printed by F. A. ACLAND, Printer to the King's Most Excellent Majesty, 1926.