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 1928

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DOMINION EXPERIMENTAL STATION
STE. ANNE DE LA POCATIÈRE

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

THE SEASON

The snow was slow to disappear in the spring of 1928, after a severe winter, and work on the land was started later than usual.

Seeding was begun on May 11, on drained land, and continued under favourable weather conditions until May 20, after which very poor weather prevailed until the middle of June, and a good many farmers of the district were unable to complete their seeding until the end of that month.

The summer and the first part of the fall were rather cold and a good deal of the grain had to be harvested before ripening. However this cool weather was favourable for hay crops and pastures.

Hoed crops, such as corn, swede turnips and potatoes were below the average, while the fruit crop was very good.

1928—METEOROLOGICAL RECORDS

Months	Temperature (F.)							Precipitation (Inches)				Sunshine (hours)	
	Mean	Maximum 1928			Minimum 1928			Rain	Snow	Total Precipitation			
	1928	Highest	Date	Mean maximum	Lowest	Date	Mean minimum	1928	1928	1928	Average 16 years	1928	Average 10 years
	°	°	°	°	°	°	°	in.	in.	in.	in.	hrs.	hrs.
January	15·0	41·0	10	23·8	−13	19	6·38	.....	42·5	4·25	2·50	73·5	90·45
February	11·6	38·0	23	21·2	−25	26	2·06	.....	15·0	1·50	2·54	127·5	113·64
March	20·7	43·0	13	29·4	− 7	5	3·72	0·15	7·0	0·22	2·30	137·40	132·97
April	21·4	50·0	6	40·4	5	15	2·43	1·01	15·0	2·51	2·66	128·40	154·33
May	48·6	70·0	6	59·2	30	9	38·0	5·49	.....	5·49	3·26	145·5	202·33
June	58·1	78·0	14	68·8	40	18	47·5	3·86	.....	3·86	2·92	140·0	211·39
July	64·0	84·0	2	74·9	45	11	53·2	3·21	.....	3·21	3·21	262·25	245·92
August	64·4	89·0	16	74·8	65	15	54·0	2·96	.....	2·96	2·43	195·15	224·32
September	46·0	72·0	6	51·7	32	30	40·4	1·52	.....	1·52	3·10	126·40	160·52
October	45·5	72·0	5	52·3	22	29	38·7	2·67	.....	2·67	3·24	86·45	110·98
November	29·1	50·0	15	36·7	5	29	21·6	1·31	11·0	2·32	2·46	68·00	58·62
December	22·3	48·0	17	29·6	1	22	15·0	0·57	5·0	1·07	2·02	90·50	69·34
	37·2	89·0	.....	48·7	−25	.....	26·9	22·75	95·5	26·3	27·0	1,143·20	1,784·81

ANIMAL HUSBANDRY

DAIRY CATTLE

The Ayrshire herd at this station has again increased in number during the year, and on December 31, 1928, it included two herd sires, twenty cows, four two-year old heifers, thirteen yearling heifers and sixteen calves. These were used for breeding purposes, experiments, and demonstrations.

Out of seventeen cows which have completed one or more lactation periods, sixteen qualified in the Record of Performance periods, and nine gave one-third more milk than the quantity necessary to qualify.

The two bulls at the head of the herd qualified for Advanced Registry, in class AA. One of these, Ste. Anne Lord Kyle 12th—97949—is out of Briery Lass —85707—which made a world's record, since eclipsed, of 22,035 pounds of milk and 979 pounds of fat. His sire, Ottawa Lord Kyle—77049—A.R. No. 52, class A, was a prize winner at the Royal Winter Fair in 1922. The other bull, Ottawa Supreme 28th, is a son of the famous cow Auchinbay Mina 5th (imp)—70080—which gave 16,243 pounds of milk containing 677 pounds of fat in the four-year class and which won a Grand Championship at the Royal Winter Fair.

Sixteen young registered bulls from very good stock were sold this year to be placed at the head of herds in the district.

PRODUCTION OF THE DAIRY HERD

The production of all cows that completed a lactation period in 1928 is given in the following table. The feed was charged at the following prices:—

Hay, ton	$ 7 75
Green fodder (O.P.V. hay), ton	8 66
Silage, ton	3 52
Roots, ton	2 77
Green fodder, ton	2 50
Pasture, month	2 00
Beet pulp, ton	39 50
Meal mixture, ton	40 00

The meal mixture was valued at the market price and had the following composition:—

Barley meal	400	pounds at	$2	45	per 100	pounds
Corn meal	100	"	2	25	" 100	"
Brewers' grain	200	"	1	60	" 100	"
Gluten meal	200	"	1	75	" 100	"
Bran	400	"	1	62	" 100	"
Linseed meal	100	"	2	65	" 100	"
Average cost of the mixture			$40	00	per ton	

Name and number of cows	Date of calving	Age at beginning of lactation period	Number of days in lactation period	Total pounds of milk for period	Average per cent fat in milk	Pounds of butter produced in period	Value of butter at 35 cts. per pound	Value of skim-milk at 20 cents per 100 pounds	Total value of products	Amount of meal at $2 per 100 pounds	Amount of roots at $2.77 per ton	Amount of silage at $3.52 per ton	Amount of green feed at $2.50 per ton	Amount of beet pulp at $39.50 per ton	Amount of hay at $7.75 per ton	Amount of oat hay at $8.66 per ton	Months of pasture at $2 per month	Total cost of feed for period	Cost to produce 100 pounds of milk	Cost to produce 1 pound of butter, skim-milk neglected	Profit on cow during period, labour and calf neglected
		years	days	lb.	%	lb.	$	$	$	lb.	lb.	lb.	lb.	lb.	lb.	lb.		$	$	cts.	$
Floss of Elmbrook—72578	24-4-27	7	311	10,956	4·22	543·6	190·26	18·63	208·89	2,610	5,150	5,800	2,850	280	1,260	1,020	4	95 93	0 88	17·6	112 96
Lady Jane—63284	1-5-27	10	321	10,600	4·10	510·8	178·78	18·02	196·80	2,425	5,100	5,300	2,800	400	1,320	920	4	93 39	0 88	18·2	103 41
Brisry Lass—85707	16-5-27	11	299	10,442	3·95	485·3	169·86	17·75	187·60	2,450	5,625	4,900	3,000	.....	1,730	930	4	87 89	0 84	18·2	99 71
Lawndale Daisy—83184	21-2-28	6	274	9,820	4·25	491·2	171·92	16·69	188·61	2,355	4,620	6,720	950	.....	2,540	.....	4	84 36	0 86	17·2	104 25
Springburn Lovely Star—78964	15-3-27	6	320	9,382	4·07	449·4	157·29	15·95	173·24	2,197	4,735	6,465	2,600	360	1,862	1,030	4	91 55	0 98	20·4	81 69
Springburn Lovely Actress—63540	4-4-27	8	346	9,246	4·94	537·4	188·09	15·72	203·81	2,207	5,080	6,150	2,650	310	1,919	850	4	90 55	0 98	21·1	113 26
Ste. Anne Finette—83980	4-9-27	4	377	9,021	3·73	396·3	138·70	15·34	154·04	2,111	5,707	4,875	1,800	.....	2,140	.....	3	75 24	0 83	19·0	78 80
Ravensdale Queen Bess—67083	19-8-27	8	302	8,798	4·02	415·7	145·49	14·95	160·44	1,922	6,000	5,850	2,100	.....	1,670	940	3½	76 09	0 86	18·3	84 35
Ste. Anne Frivole 2—86194	8-1-28	3	326	8,714	4·40	451·5	158·02	14·81	172·83	2,043	6,202	4,145	950	.....	3,893	.....	4	81 03	0 93	17·9	91 80
Queenie of Lawndale—82120	20-6-27	5	285	8,493	4·16	416·0	145·60	14·24	159·84	1,945	5,450	4,200	3,400	.....	1,340	860	4	75 00	0 88	18·0	84 84
Ste. A. Primerose 2—92071	11-2-27	2	341	8,256	4·24	412·0	144·20	14·03	158·23	2,100	4,985	5,164	2,100	255	1,618	790	4	83 35	1 01	20·2	74 88
Springburn Primerose—94321	27-2-27	2	326	8,020	4·23	399·5	139·82	13·63	153·45	2,040	4,305	5,210	2,330	300	1,498	800	4	82 21	1 03	20·6	71 24
Ravesette du Lac—73342	2-2-28	7	303	7,762	4·44	405·2	141·82	13·00	154·82	1,790	5,875	4,870	900	.....	3,360	.....	4	74 66	0 97	18·4	80 16
Ste. Anne Malonie 2—89284	15-10-27	3	365	7,321	4·40	378·8	132·58	12·45	145·03	1,633	5,871	5,865	620	.....	2,923	830	2½	72 14	0 99	19·0	72 89
Oakland de Ste. Anne 2—80550	11-3-28	4	218	7,023	4·08	337·5	118·12	11·94	130·66	1,388	3,132	2,700	850	.....	2,380	.....	4	54 90	0 78	16·3	75 76
Ste. A. Mignonne 4—83979	18-11-27	4	275	6,350	4·28	319·4	111·72	10·79	122·58	1,392	4,350	5,915	500	.....	1,530	430	3½	59 35	0 93	18·6	63 23
Ste. A. Doreen 3—86192	12-4-27	3	291	6,196	3·97	289·4	101·29	10·53	111·82	1,522	3,270	4,875	2,150	160	1,250	890	4	66 09	1 07	22·8	45 73
Ste. A. Flavia 3—86193	1-3-27	3	337	6,993	4·04	332·4	116·34	11·89	128·23	1,670	4,240	6,010	1,850	310	1,710	800	4	76 37	1 09	23·7	51 86
Total			5,607	153,393	.....	7,571·4	2,649·90	260·36	2,910·92	35,800	99,697	95,014	34,400	2,375	35,943	11,090	68	1,420 10	.....	.....	1,490 82
Average of the herd			312	8,522	4·20	420·63	147·22	14·46	161·72	1,989	4,983	5,279	1,911	132	1,997	616	3¾	78 88	9 26	18·8	82 82
Average of the five best cows			303	10,240	4·12	496·06	173·62	17·40	191·03	2,407	5,046	5,837	2,440	208	1,742	786	4	90 62	0 89	18·3	100 20

In the preceding table, all feeds, with the exception of beet pulp and meal, were charged at the cost of production on the farm. The value of the butter was arrived at by taking the average of market prices for the whole of the year 1928. This method of figuring is justified by the fact that the production of the herd on this farm is evenly distributed throughout the year.

It will be noted from this table that the profit on each cow is closely related with the quantity of milk and butter produced. Cows producing over 10,000 pounds of milk gave a profit of $100 or more, while the profit on cows yielding between 6,000 and 7,000 pounds is under $60. The only means of finding unprofitable producers with a view to getting rid of them is to weigh and test the milk regularly and keep a careful record of the feed consumed.

AVERAGE PRODUCTION OF THE HERD SINCE 1921

Year	Number of cows	Average production of milk	Average production of butter
		lb.	lb.
1921	17	5,452	250·22
1922	9	5,251	238·00
1923	12	5,870	272·10
1924	19	7,868	344·56
1925	13	9,764	494·39
1926	20	10,072	527·00
1927	24	8,713	430·15
1928	18	8,522	420·63

OFFICIAL RECORDS:—CANADIAN RECORD OF PERFORMANCE, 1928

Name and number of cows	Age at commencement of test	Number of days milking	Pounds of milk produced	Pounds of of fat produced	Average per cent fat
	years	days	lb.	lb.	%
305 Day Class—					
Briery Lass—85707	11	289	10,443	395	3·78
Lady Jane—63284	10	305	10,496	400	3·81
Floss of Elmbrook—72578	7	305	10,943	436	3·98
Lawndale Daisy—83184	6	305	12,907	523	4·05
Ravenette du Lac—73342	7	293	9,826	405	4·12
Ste. A. Primerose 2—92071	2	305	7,849	327	4·17
Ravensdale Queen Bess—67093	8	302	8,798	348	3·96
Ste. A. Fadette 2—87702	3	285	7,268	293	4·03
Ste. A. Lovely Star 2—86195	3	303	7,023	267	3·80
Ste. A. Frivole 2—86194	3	287	7,482	281	3·76
Springburn Primerose—94321	2	305	7,819	324	4·14
Ste. A. Daisy 2—92070	2	305	7,109	334	4·70
365 Day Class—					
Lanwdale Daisy—83184	6	337	13,026	528	4·05
Floss of Elmbrook—72578	7	310	10,956	436	3·98
Ste. A. Ravenette—85839	3	365	9,999	409	4·09
Ste. A. Daisy 2—92070	2	328	7,276	343	4·71
Springburn Primerose—94321	2	326	8,021	335	4·18
Ste. A. Primerose 2—92071	2	341	8,256	349	4·23
Total		5,596	165,497	6,733	
Average for 305 day class (Honour Roll)		299	8,997	361	4·01
Average for 365 day class (Record of Performance)		334	9,589	400	4·17
Average for two year old cows		314	7,722	335	4·34
Average for 18 cows		311	9,194	374	4·07

It will be noted from the above table that eighteen cows have made an official record during the year, twelve in the 305-day class (Honor Roll) with an average of 8,997 pounds of milk testing 4·01 per cent fat, and six in the

365-day class (Record of Performance) with an average of 9,589 pounds of milk, testing 4·17 per cent fat. All the cows, young and old, made good records. However, if age is taken into account, the two and three-year-old cows gave a higher average production than the mature cows, possibly on account of the quality of their sires.

These records were made under conditions similar to those which are found on many of the farms of the province, where pure-bred cattle are kept. Breeders of pure-bred dairy cattle should therefore take advantage of every opportunity to keep official records of the production of their cows, because a Record of Performance certificate is a very much sought for guarantee and is often required by buyers of registered animals.

COST OF RAISING MALE AND FEMALE CALVES

Detailed records are kept of the food consumed by each of the dairy animals raised on this farm. Thus the cost of rearing bulls to one year of age and heifers until the first calving have been determined.

The feed cost of raising an animal varies with the kind of feeds given and the prices charged for these feeds. However, the information contained in the following tables will be found valuable. It shows that the cost of raising a bull to one year of age and a heifer until the first calving is not unduly high, as the feed given in this case was varied and plentiful.

COST OF FEED TO RAISE CALVES (MALE) FROM BIRTH TO ONE YEAR OF AGE

Name of bulls and numbers	Amount of whole milk at $1.65 per cwt.	Amount of skim-milk at 20cts per cwt.	Amount of hay at $7.75 per ton	Amount of roots at $2.77 per ton	Amount of meal at $2 per cwt.	Amount of Blach-ford meal at $4.75 per cwt.	Amount of Gro-fast at $6 per cwt.	Total cost of feed
	lb.	lb.	lb.	lb.	lb.	lb.	lb.	$
Ste. Anne Lord Kyle 24—113475...	128	3,190	1,093	1,830	577	35	.....	28 46
Ste. Anne Supreme 10—113473.....	204	2,580	1,310	1,830	611	40	.....	30 26
Ste. Anne Supreme 14—105383.....	300	2,129	1,136	660	964	.....	44	36 44
Average (1928).....	211	2,633	1,180	1,440	717	25	15	31 72
Average for 2 years with 14 calves.	361	2,480	1,088	1,131	824	54	32	32 88

COST OF FEED TO RAISE HEIFERS FROM BIRTH TO FIRST CALVING

Name of heifers and numbers	Amount of whole milk at $1.65 per cwt.	Amount of skim-milk at 20 cts. per cwt.	Amount of hay at $7.75 per ton	Amount of silage at $3.52 per ton	Amount of roots at $2.77 per ton	Amount of oat hay at $8.66 per ton	Amount of meal at $2 per cwt.	Amount of Blatch-ford meal at $4.75 per cwt.	Months of pasture at $1.50 per month	Total cost of feed
	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	months	$
Ste. A. Finette de Kyle—113466...	457	3,103	2,467	3,900	3,210	996	2,716	.....	4½	100 25
Ste. A. Doreen 4—105303.....	396	2,159	2,778	3,910	3,340	640	895	131	7½	71 02
Ste. A. Lady Jane—105302.....	390	2,159	2,215	4,805	3,205	910	1,029	131	8½	75 97
Ste. A. Primerose 3—105381.....	334	2,039	2,576	4,865	4,025	740	1,097	156	8½	79 26
Average.....	394	2,365	2,509	4,370	3,445	822	1,434	105	7½	81 68
Average for 2 yrs. (for 13 heifers).	372	2,481	2,894	5,563	2,053	253	1,327	32	7½	72 57

ROOTS AS SUBSTITUTE FOR MEAL

An experiment was started this year to determine the value of roots as substitute for a part of the meal ration in the feeding of dairy cows. Two lots of six cows each were used in this experiment; one lot received swede turnips and the other beets.

The feeding experiment included three successive periods for each lot. In the first and third periods, the cows received hay, and a half-ration of meal and roots. In the second period, they received hay and meal only.

The results obtained in period 2 were compared with the averaged results of periods 1 and 3.

In this preliminary experiment, swede turnips and beets had a feeding value of $6.25 and $6.41 per ton, respectively, as they replaced about 50 per cent of the meal ration, while the cost of production of these roots was only $2.77 per ton. These results should encourage the growing of roots on a larger scale, as they appear to be an economical substitute for meal in the ration of dairy cows in this district. Further tests will be undertaken to confirm the results obtained this year.

TWO VS. THREE MILKINGS A DAY

An experiment was undertaken this year to determine the effect of the number of milkings on milk and butter-fat production. This experiment was conducted with two lots of three cows each, similar as regard condition and dairy capacity, receiving the same feeds and giving an average of 40 pounds of milk per day.

The only difference between the two lots was that the cows in one lot were milked twice a day, while the cows of the second lot were milked three times a day.

Cows milked three times per day gave 14 per cent more milk and 22 per cent more butter-fat than those which were milked twice a day.

List of Experiments Conducted for the Animal Husbandry Division

Dairy Cows

A 501—Breeding Ayrshire cattle.
A 56—Cost of milk production.
A 59—Periodic costs of rearing dairy females.
A 456—Periodic costs of rearing dairy males.
A 8—Corn silage vs. roots and corn silage for milch cows.
A 260—Corn silage vs. oat hay for milch cows.
A 7—Corn silage vs. mangels for milch cows.
A 642—Value of roots as substitute for meal in dairy cows' ration.
A 497—Value of skim-milk in calves' ration.
A 498—Comparison of calf meal mixtures for raising calves.
A 219—Feeding of mineral to calves and heifers.
A 219a—Potassium iodide for pregnant cows and heifers.
A 268—Feeding of minerals to milch cows.
A 556—Three milkings and three feedings vs. two milkings and two feedings for milk production.
A 660—Serum test for contagious abortion.

SWINE

BREEDING AND REARING OF YORKSHIRE PIGS

The object of the work with swine is to study the best methods of breeding, to improve breeding of animals by selection and grading and develop by suitable feeding market hogs of a good bacon hog type.

At the end of the year 1928, the herd totalled 48 head including 12 brood sows, 2 boars and 34 young feeder pigs.

During the year, 10 sows farrowed 174 pigs, an average of 17·4 per sow. Out of this number, 66 per cent were raised, 30 per cent of which were sold for breeding purposes. All the others were kept at the station and divided into lots for feeding. A number of pigs from the fall litters are still included in this fattening experiment.

FEED COST OF MAINTENANCE OF BREEDING SOWS

Feed cost for the maintenace of nine breeding sows for one year

Number of sows	9
4,280 pounds bran at $32.40 per ton	$ 69 34
7,788 pounds shorts at $33.60 per ton	130 84
5,926 pounds middlings at $40.00 per ton	118 52
8,941 pounds skim milk at 20 cents per 100 lbs	17 88
1,640 pounds green feed at $2.50 per ton	2 05
3,006 pounds beans at $30.00 per ton	45 09
13,635 pounds turnips at $2.77 per ton	18 88
5,140 pounds clover hay at $7.75 per ton	19 92
1,699 pounds oats at $48.00 per ton	40 78
140 pounds barley meal at $49.00 per ton	3 43
255 pounds linseed meal at $53.00 per ton	6 76
Total cost of feed	$ 473 49
Average cost per sow	52 61
Average cost for 5 years	41 06

The above table shows that the average maintenance cost of a sow for one year amounted to $52.61. In 1927, the cost was $52.51 for 9 sows, in 1926, $38.52 for 10 sows, in 1925, $32.95 for 7 sows and in 1924, $28.71 for 8 sows. It will be seen that there has been a gradual increase in the cost from 1924 to 1928. This increase is partly due to the large increase in the prices of meal; for instance, in 1924 the average price of meal was $35 per ton, while it was $40 and $42 in 1927 and 1928, respectively. Furthermore, in 1924, 1925 and 1926, only two sows gave two litters each during the year, while during the last two years, four sows gave two litters each during the year. Another factor influencing the cost of feed is the number of pigs per litter; more food is required to maintain a sow in good condition when the sow has a large litter to raise than to maintain a sow that raises only a few young pigs.

FEED COST OF RAISING PIGS TO WEANING AGE

Number of sows	7
Number of litters farrowed	10
Number pigs born	105
Number of pigs raised	86
Average number of pigs raised per litter	8·6
Total cost of feed for 7 sows	$ 368 27
10 boar services at $1.00	10 00
Total feed cost of 86 pigs at weaning age	378 27
Average cost for 1 pig at weaning age	4 40

FEED COST OF RAISING PIGS TO WEANING AGE OVER A PERIOD OF 6 YEARS

Number of sows	8·7
Number of pigs born	112·1
Number of pigs raised	88·7
Feed cost for 8·7 sows	$ 327 39
10 boar services at $1.00	10 00
Total feed cost for 88·7 pigs at weaning age	337 39
Average cost for one pig at weaning age	3 80

The above table shows that the cost of maintenance of sows in 1928 was $52.61 per head and that the average cost over a 5-year period was $41.06. The average cost of young pigs at weaning time was $4.40 per head and $3.80 for a period of six years. The number of litters and the number of pigs raised are two of the factors influencing the cost of young pigs at weaning age.

COST OF A POUND OF PORK

Number of pigs fed		17
Cost of 17 pigs at $4.40 at weaning age		$ 74 80
Feed consumed:		
2,712 pounds bran at $32.40 per ton	$ 43 93	
3,318 pounds middlings at $40.00 per ton	66 36	
1,077 pounds ground oats at $48.00 per ton	25 85	
1,861 pounds ground corn at $45.00 per ton	41 87	
829 pounds ground barley at $49.00 per ton	20 31	
550 pounds mixed grains at $40.00 per ton	11 00	
4,090 pounds skimmed milk at 20 cents per 100 lbs	8 18	
675 pounds green fodder at $2.50 per ton	0 84	
1,421 pounds turnips at $2.77 per ton	1 97	
Total cost of feed		$ 220 31
Total		295 11
Quantity of pork produced		2,683 lbs.
Cost of a pound of pork		$ 0 11

ONE VS. TWO LITTERS PER YEAR

—		One litter	Two litters
Number of sows	No.	5	4
Number of pigs born	"	49	97
Average number of pigs per litter	"	9·8	12·1
Number of pigs raised	"	40	68
Feed consumed:—			
Bran	lb.	2,330	1,950
Shorts	"	4,612	3,176
Middlings	"	3,457	2,469
Ground oats	"	858	841
Ground barley	"	.....	140
Linseed oil cake	"	115	140
Milk	"	4,283	4,658
Beans	"	1,344	1,662
Turnips	"	7,095	6,540
Green fodder	"	.....	620
Hay	"	2,985	2,155
Total cost	$	259 41	214 08
Cost per head	$	51 88	53 52
Average cost per pig at weaning age	$	6 49	3 15

AVERAGE COST FOR A FIVE-YEAR PERIOD

Years	Number of sows, 1 litter	Pigs raised per litter	Cost of young pigs at weaning	Number of sows, 2 litters	Pigs raised per litter	Cost of young pigs at weaning
			$			$
1928	5	8·0	6 48	4	17·0	3 15
1927	5	8·6	5 73	4	17·7	2 83
1926	8	7·1	5 03	2	14·5	3 35
1925	4	6·5	4 25	3	22·6	1 86
1924	5	5·0	4 84	2	13·0	3 77
Average cost	.....	.....	5 27			2 99

It is easy to deduce from the preceding table that pigs cost much more at weaning age when sows farrow only one litter during the year than when they give two. The profit per sow is also very much reduced under the one litter a year plan. Another advantage in favour of fall litters is that pork always commands a higher price in the spring than in the fall.

In order to avoid diseases and other troubles, the fall litters should come before October 15 at the latest, so that they may be well developed before the real cold weather arrives. Breeders who wish to have their fall litters arrive at that date should arrange their breeding to get their spring litters fairly early. In this way, the sows have six or seven weeks to nurse their pigs and they also have time to get in good condition before they are bred again. This is essential in order to obtain large litters of thrifty pigs.

MINERAL MIXTURES AND POTASSIUM IODINE FOR BROOD SOWS

The mineral mixture consisted of two parts of bone phosphate, one part of charcoal, one part of finely ground limestone and one quarter part of salt. This mixture is given at the rate of 2½ per cent of the meal ration. The potassium iodide was mixed with water at the rate of one ounce of iodide per gallon of water and it was given at the rate of one tablespoonful of the mixture per head and per day. The meal mixture was the same for the three lots.

MINERAL MIXTURES AND POTASSIUM IODIDE FOR BROOD SOWS

—	Mineral mixtures	Check	Potassium iodine
Number of sows.....No.	2	2	2
Number of pigs born..... "	22	30	26
Average weight at birth.....lb.	2·45	2·0	2·6
Number of pigs raised.....No.	20	6	16
Average weight at weaning.....lb.	25·9	25·4	26·7

The above table shows that the number of pigs raised varied greatly for each lot. For instance, the two sows fed the mineral mixture farrowed 22 pigs, 20 of which were raised; the other two, being smaller and weaker than the rest were smothered.

The two sows receiving potassium iodide farrowed 26 pigs, 10 of which died before weaning; four were dead at birth and six were crushed. The two sows fed meal only farrowed 30 pigs, of which 6 only were raised; fourteen were dead at birth, 4 were crushed and 6 being smaller and weaker than the others, died a few days later.

While the individuality of each of the sows may have had something to do with these results, there is no doubt that the use of mineral mixtures and potassium iodide is an important factor as regards the number of uniform and thrifty pigs raised.

Experiments were undertaken during the year on the feeding of pigs from weaning age until the end of the feeding period. The object of one of these experiments was to find out whether it is more profitable to purchase meal to raise and finish pigs or grow the necessary grains on the farm. The object of two other experiments was to find out the value of tankage and the value of turnips to grow and finish pigs for marketing. The object of the fourth experiment was to determine the value of cull potatoes for pigs. The following table shows the method followed for each of the lots, the meals used and the proportion of each:—

Lot No. 1, meal and clover hay.	First 60 days: shorts, 2 parts middlings, 2 parts. Following period: shorts, 1 part, middlings, 2 parts, corn, 2 parts.	Lot No. 2, meal and clover hay.	First 60 days: oats, 2 parts, barley, 1 part, shorts, 1 part. Following period: oats, 1 part, shorts, 2 parts, barley, 2 parts, peas, 2 parts.
Lot No. 3, meal, clover hay and turnips	First 60 days: oats, 2 parts, barley, 1 part, shorts, 1 part. Following period: oats, 1 part, shorts, 2 parts, barley, 2 parts, peas, 2 parts.	Lot No. 4, meal, clover hay and tankage	First 60 days: oats, 2 parts, barley, 1 part, shorts, 1 part, tankage, 6 per cent. Following period: oats, 1 part, shorts, 2 parts, barley, 2 parts, peas, 2 parts, tankage, 3 per cent.
Lot No. 5: meal, clover hay and potatoes (4 to 1 pound of meal).			
Lot No. 6: meal, clover hay and potatoes (2 to 1 pound of meal).	First 60 days: oats, 2 parts, barley, 1 part, shorts, 1 part.		Following period: oats, 1 part, shorts, 2 parts, barley, 2 parts, peas, 2 parts.

The turnips were fed raw at the rate of 1½ pound per head per day, from the age of two to three months, and at the rate of two pounds per head per day after this age. Potatoes were given cooked and in the quantity mentioned above.

No deductions could be made from a single experiment; this experiment will be continued for a few years so that reliable conclusions may be made as to the value of the various feeds mentioned.

List of Projects Undertaken for the Animal Husbandry Division

Swine

A 513—Breeding Yorkshire swine.
A 162—Economy of fall and spring litters.
A 422—Corn vs. oatmeal for market hogs.
A 639—Comparison of millfeeds vs. home-grown feed for bacon production.
A 638—Value of turnips for hog feeding.
A 382—Value of tankage for hog feeding.
A 165—Value of unmarketable potatoes for hogs.
A 534—Comparison of oats and barley meal for market hogs.
A 463—Value of alfalfa hay and roots for hogs.
A 114—Mineral condiments for brood sows.
A 135—Comparison of corn and barley for bacon production.
A 476—Value of potassium iodide for brood sows.
A 634—Curing meats under farm conditions.
A 423—Economy of rearing one vs. two litters per year.
A 166—Cost of maintaining herd boar.
A 163—Cost of pork production.
A 160—Cost of raising pigs to time of weaning.
A 158—Cost of feeding brood sows.
A 157—Cost of raising pigs to breeding age.
A 656—Preliminary trials of a scheme of advanced registration for swine.

SHEEP

BREEDING AND RAISING OF LEICESTER SHEEP

The sheep at this Station are pure-bred Leicesters. The flock is headed by two imported rams: "Nether Hall Emigrant" (6173) 19147, imported by the Director of the Experimental Farm at Ottawa, in April, 1923, and "Morning Glory" (6866) 19248, imported by the Quebec General Breeders' Association. The latter ram was champion at several fairs and he has shown his prepotency in the prizes won by his progeny at the Quebec fairs.

Out of 36 ewes and ewe lambs included in the flock, 13 are sired by the imported ram "Border Standard" (6172) 19146, 13 are sired by another imported ram, "Culloden Demonstrator" (6171) 19145, and the 10 ewe lambs are sired by "Morning Glory" (6866) 19248. The quality of the flock has been greatly improved by these imported animals of superior quality.

At the beginning of 1928 the flock numbered 34 head, including 26 ewes, six ewe lambs, and two mature rams. Thirty ewes and ewe lambs gave birth to 39 lambs, 28 of which were raised. Practically all the male lambs were classed in the "Three-star" class and sold for breeding to farmers of the district. One of these lambs, placed first at the Quebec Fair, and 10 ewe lambs by the ram "Morning Glory" were kept in the flock for breeding purposes.

This flock of Leicester sheep was started in 1921. The average weight of the ewes was then 98 pounds and that of the ewe lambs 73·8 pounds. On November 1, 1928, the ewes averaged 165·2 pounds and the ewe lambs 98·1 pounds. This result is due to the fact that good rams were kept at the head of

the flock since 1921, and that a rigid selection was practised every year and rational methods of feeding followed. This is a considerable increase in weight as well as in quality.

COST OF MAINTAINING THE FLOCK

Number of sheep wintered	34
18,526 pounds hay at $7.75	$ 71 78
3,963 pounds oats at 2 cents	79 26
3,270 pounds bran at $32.40	52 97
5 months on pasture at 20 cents per head per month	34 00
Total cost of feed	$ 238 02
Cost per head	7 00

It will be noted that the cost of feed per head is high at this Station. This is due to the fact that our pastures are very poor, and the sheep have to be kept in the barn until late in the spring and brought back early in the fall. Thus the cost of hay and meal is a large item. It is hoped, however, that a change will be made in the near future. A start has been made in the renovation of our sheep pastures, and the results obtained thus far give us the hope that we will soon have pastures containing more clover and grasses. This will enable us to improve the summer feeding and lower the feed cost during the winter. The average feed cost for one sheep over a seven-year period is as follows:—

1928—34 head	$ 7 00
1927—57 head	6 27
1926—42 head	6 38
1925—51 head	4 89
1924—55 head	5 73
1923—51 head	6 99
1922—51 head	6 61
Average cost for 7 years	6 27

COST OF EWE LAMBS AND RAMS

These projects were undertaken at this Station in 1926 in order to find out the cost of feed for the raising of male and female lambs for breeding purposes. In this district, the ewe lambs are generally left in the flock to be bred during November and December; and this is why the cost has been figured until November 1. It is also at this date that the male lambs are sold for breeding purposes.

The average cost for a three-year period is shown in the following table:—

Number of male and female lambs born from these ewes	17·3
Average number per ewe	1·3
Average weight at birth	8 lbs.
Average weight on Nov. 1	90·6 lbs.
Feed cost of ewes, value of fleeces deducted	$ 57 47
Pasture, 3 months, 17·3 head at 20 cents per head per month	10 38
Maintenance cost of the ram in proportion to the number of ewes	0 31
Total cost	68 16
Cost per head	3 94

To follow up this project on the cost of raising male and female lambs until the age of 7 to 8 months, another project has been undertaken, the purpose of which is to find out if it is more profitable to breed the ewes at the age of 7 or 8 months or to wait until they are one year and a half old.

This experiment was started in the spring and it will be continued for several years in order to see if it is possible and profitable to maintain the quality and the weight of ewes by this method.

COST OF MARKET LAMBS

Most of the lambs raised at this Station are sold for breeding purposes; no lambs are kept specifically for marketing purposes; however, a record is kept of feed costs as well as of the weight of all lambs, male and female. The above

table includes all that might enter into this project and the reader is referred to it for the details of the cost of lambs at marketing age. This cost was $3.94 in 1928.

IS IT MORE PROFITABLE TO HAVE THE EWES LAMB EARLY OR LATE IN THE SPRING?

For the purpose of this experiment, the lambs born in February and in the first days of March made up one lot, and those born in the latter days of March and in April made up the second lot.

—	1st lot Feb. 20 to March 5	2nd lot March 26 to April 5
Number of ewes	5	5
Number of lambs issued from these ewes	7	8
Average number per ewe	1·4	1·6
Average weight at birth	8·9 pounds.	8 pounds.
Average weight on Sept. 15	91·4 pounds.	64·1 pounds.

This is the first year that this experiment has been conducted, and we do not know whether future results will be similar. However, it will be observed that there is a difference of 27·3 pounds in the weight of early and late-born lambs on September 15. This is a considerable advantage for those who market their lambs, and especially for the breeders of pure-bred sheep; very often, lambs born late in the spring are not sufficiently developed to satisfy the purchasers' requirements, but nevertheless will command remunerative prices when sold for meat at the end of September and in October.

LIST OF PROJECTS UNDERTAKEN FOR THE ANIMAL HUSBANDRY DIVISION

Sheep

A 510—Breeding Leicester sheep.
A 328—Breeding ewe lambs vs. breeding as shearling ewes.
A 311—Cost of maintaining breeding ewes.
A 316—Cost of rearing ewe lambs to breeding age.
A 338—Cost of rearing market lambs.
A 408—The economy of early vs. late lambs for market.
A 596—Cost of rearing ram lambs for breeding purposes.

HORSES

On December 31, 1928, the number of pure-bred Percheron horses on the Station was as follows: one imported stallion "Chacal" 12951—165185—, one three-year old stallion, 12 mares, 2 two-year old fillies, 1 yearling filly and 6 colts born during the year, 3 males and 3 females.

The mares were used for experiments on breeding and feeding as well as for farm work.

Very good results were obtained in 1928. Out of 7 mares bred, 6 good colts, 3 males and 3 females, were raised. In the fall, 14 Percheron horses exhibited at the Quebec Fair won 9 first prizes and four second prizes. The stallion "Chacal" won the Grand Championship for males, and the mare "Ste Anne Mathilda" bred at this station was classed as the best mare. Both her sire and dam were also bred at this Station.

As in previous years, an exhibition of horses was held under the auspices of the Agricultural School in order to encourage the breeding of draft horses. Over 200 Percheron and grade horses were shown, and there again the horses of the Station won much distinction.

COST OF HORSE LABOUR

An exact record was kept during the year of all feed consumed by all horses used for farm work. The average weight of the seven horses used in this experiment was 1,648 pounds and the total average quantity of feed consumed per horse was as follows: hay, 5,374 pounds valued at $7.37 per ton, cost price; oats, 4,399 pounds valued at 74 cents per bushel (34 pounds); bran, 681 pounds at $32.42 per ton. At the prices mentioned for the feed consumed, the average cost of feed was $126.52 for the year, that is for 365 days. These horses were not pastured during the summer. Each horse worked an average of 1,773 hours; thus the cost per hour of horse labour was 7 cents per hour. This average cost may be considerably reduced where horses may be worked profitably during the winter. The average hourly feed cost of horse labour over a seven-year period is 6·7 cents.

AVERAGE COST OF FEED FOR COLTS FROM WEANING TO 2½ YEARS OF AGE

Name	Weight	Hay	Oats	Bran	Pasture	Total cost
	lb.	lb.	lb.	lb.	months	$ cts.
Ste. Anne Carmen	1,475	4,948	3,188	673	9	111 61
Mathilda 2nd	1,525	5,433	3,683	753	8	123 45
Ste. Anne Juliette	1,495	4,990	3,900	600	5·3	123 61
Mathilda 3rd	1,428	5,310	3,990	700	7	130 80
Ste. Anne Minette 2nd	1,425	4,104	2,940	900	9	98 67
Ste. Anne Mela 4th	1,500	4,696	3,275	954	9	107 80
Ste. Anne Julia 3rd	1,450	4,452	3,126	878	9	103 09
Mela 3rd	1,600	4,602	3,881	833	8	119 57
Jeannette	1,525	4,992	4,116	785	8	125 01
Juliette	1,600	5,233	3,823	1,448	8	117 99
Jaconde	1,550	4,573	3,496	1,347	9	110 41
Mathilda	1,525	4,456	3,323	1,332	9	106 99
Mercure	1,675	6,186	4,898	1,665	4	133 81
Total	19,773	63,975	47,639	12,868	102·3	1,512 81
Average	1,521	4,921	3,665	9,898	7·9	116 37

The above table shows that the average quantity of feed consumed to raise thirteen colts, over a five-year period, from weaning to 2½ years of age, when colts may be broken and earn their feed, was as follows: hay, 4,921 pounds; oats, 3,664 pounds; bran, 990 pounds and pasture, 7·9 months. This is a total average cost of $116.37 for horses weighing an average of 1,521 pounds.

It should be noted that these average prices are for pure-bred horses. The hay is figured at cost price in the barn, oats and bran at the market prices. Nothing is counted for the mares which have borne and fed these colts, but here as elsewhere, mares used for the breeding of colts more than pay for their feed by their work during the year.

This average cost of $116.37 for 1,500 pound colts should induce a greater number of farmers to breed draft horses.

LIST OF PROJECTS UNDERTAKEN FOR THE ANIMAL HUSBANDRY DIVISION

Horses

A 531—Breeding Percheron horses.
A 294—Periodic costs of rearing draft horses.
A 331—Cost of maintaining work horses.
A 409—Wintering horses in barn vs. outside.
A 547—Economy of rearing fall and spring foals.
A 293—Cost of horse labour.

FIELD HUSBANDRY

Work on the land was started rather late in the spring. The first seeding was done on May 11, on drained land, and from that date until May 20, the weather was favourable, but from May 20 to the middle of June the season was poor and a great many farmers in this district were unable to complete their seeding until the end of June.

The hay crop was good, although considerable difficulty was experienced in the harvesting. The various cereals ripened late and the yield was below the average. The corn and sunflower crops were very poor; roots gave an average crop.

APPLICATION OF MANURE TO ROTATIONS

Rotation	Year Crop	Manure per acre	Percentage of value of the manure for each crop
			%
Three-year	1st year	12 tons	50
	2nd year		30
	3rd year		20
Four-year	1st year	16 tons	40
	2nd year		30
	3rd year		20
	4th year		10
Five-year	1st year	20 tons	40
	2nd year		25
	3rd year		20
	4th year		10
	5th year		5

FIXED CHARGES IN PRODUCING FARM CROPS

Rent of land (including taxes), $6.25 per acre.

Manure, $2 per ton (including $1 for the cost of applying).

Ensiling, $1.11 per ton, including hauling, machinery, gas, man labour (average for all the rotations).

Threshing: Oats, 4 cents per bushel; barley, 8·8 cents; wheat and peas, 8 cents (average for all the rotations).

Use of machinery, $2.85 per acre.

Labour, labourer and teamster, 26 and 27 cents per hour.

Horse labour. 10 cents per hour.

Twine, 14¼ cents per pound.

Seed:—

Oats	$1 25 per bushel.
Wheat	$3 00 per bushel.
Barley	$1 75 per bushel.
Peas	$3 50 per bushel.
Corn	$4 20 per bushel.
Sunflowers	15 cents per pound.
Swedes	60 cents per pound.
Red Clover	35 cents per pound.
Alsike	31 cents per pound.
Alfalfa	26 cents per pound.
Timothy	9½ cents per pound.

COST OF PRODUCING INTERTILLED CROPS PER ACRE IN 1927

Cost factors	Corn	Sunflowers	Turnips	Sunflowers and corn
	$ cts.	$ cts.	$ cts.	$ cts.
Rent and taxes	6 25	6 25	6 25	6 25
Share of cost of manure	12 40	12 40	12 80	12 80
Seed	2 07	1 50	1 12	2 96
Manual labour	9 83	9 06	24 14	8 43
Horse labour	4 22	4 04	6 03	3 43
Ensiling	11 66	18 88	.....	10 10
Machinery	2 85	2 85	2 85	2 85
Twine	0 33	0 63	.....	0 30
Cost per acre	49 61	55 61	53 19	47 12
	tons lb.	tons lb.	tons lb.	tons lb.
Yield per acre	10 1,020	17 20	18 460	9 200
	$	$	$	$
Cost per ton	4 72	3 27	2 92	5 17

The above table shows that the total cost of one ton placed in the silo was $4.72 for corn containing 15·41 per cent of dry matter, $3.27 for sunflowers containing 14·77 per cent of dry matter, and $5.17 for the corn and sunflower mixture containing 14·80 per cent of dry matter. The high cost of production of these silage crops per ton in 1928 is due to the low yields per acre on account of an unfavourable growing season. On the other hand, the yield of roots (swedes) was comparatively higher, and the cost of production of one ton of roots placed in the cellar was $2.92.

COST OF PRODUCING GRAIN

Cost factors	Oats	Wheat	Barley	Peas
	$ cts.	$ cts.	$ cts.	$ cts.
Rent and taxes	6 25	6 25	6 25	6 25
Share of cost of manure	9 60	8 40	9 60	4 80
Seed	3 70	6 13	3 12	8 40
Manual labour	5 44	5 12	5 14	10 58
Horse labour	3 40	3 20	3 15	4 18
Twine	2 87	2 47	3 21	3 98
Threshing	2 85	2 85	2 85	2 85
Machinery	0 38	0 33	0 37	.....
Total cost per acre	34 49	34 75	33 69	41 04
Cost of straw per acre	3 88	4 01	1 98	.....
Cost of producing grain per acre	30 61	30 74	31 71	.....
	bush. lb.	bush. lb.	bush. lb.	bush. lb.
Yield of grain per acre	67 —	30 6	36 24	49 48
Cost per bushel $	0 46	1 02	0 87	0 82

Although the season was not very favourable for the production of grain, it should be noted that the yields of the various kinds of grains mentioned above are high enough to make the production of the same profitable on a commercial basis.

Oats gave an average yield of 67 bushels at a cost price of 46 cents per bushel; wheat, 30·1 bushels at $1.02; barley, 36·5 bushels at 87 cents per bushels; peas, 49·8 bushels at 82 cents per bushel. These yields were obtained on well-prepared land, free from couch grass or other weeds, well manured and with the use of good seed, that is seed from good stock, with a high germinative capacity and good vitality. This seed was sown as soon as possible in the spring.

COST OF PRODUCING HAY

Cost factors	Clover	Alfalfa and Clover	Timothy	Oat hay
	$ cts.	$ cts.	$ cts.	$ cts.
Rent and taxes	6 25	6 25	6 25	6 25
Share of cost of manure	6 13	6 40	5 06	5 20
Seed	2 18	2 89	2 18	6 27
Manual labour	6 29	6 73	5 72	7 60
Horse labour	1 29	1 46	1 01	4 00
Machinery	2 85	2 85	2 85	2 85
Cost per acre	24 99	26 58	23 07	32 17
	tons lb.	tons lb.	tons lb.	tons lb.
Yield per acre	2 1,300	4 560	3 180	2 900
Cost per ton	9 43	6 21	7 46	13 13

The above table shows that the cost of production of a ton of hay depends chiefly on the yield obtained. The majority of the fixed charges entering into the cost of production, such as rent, cost of manure, seed and use of machinery, are the same, whether the yield is high or low. The cost of a ton of mixed clover and alfalfa hay was $6.21 per ton, with a yield of 4 tons, whereas the cost of clover alone was $9.43 per ton with a yield of 2 tons 1,300 pounds per acre. The cost price of $13.13 per ton of peas and oats hay is higher than in the preceding years, on account of the low yield obtained in an unfavourable season.

FIVE YEARS' AVERAGE IN THE YIELD AND COST OF PRODUCTION OF CROPS

PROJECT F. 91

Crops	Average yield per acre for 5 years	Average cost per ton or bushel for 5 years
	tons lb.	$
Intertilled Crops		
Corn	12 1,000	4 31
Sunflowers	15 1,920	3 44
Sunflowers and corn mixture	13 940	4 09
Swedes	19 240	3 05
Grain Crops	bush. lb.	
Oats	76 20	0 38
Wheat	29 54	1 05
*Barley	37 26	0 88
*Peas	51 25	1 17
Hay Crops		
	tons lb.	
Clover	3 280	8 22
Alfalfa and clover	3 580	7 49
Timothy	2 1,080	8 26
Oat and pea hay	3 440	10 17

* Four years average only.

YIELD PER ACRE AND COST OF THE DRY MATTER PER 100 POUNDS OF DIFFERENT CROPS

Crops	Yield, 1928	Dry matter percentage	Dry matter per acre		Cost per 100 pounds of dry matter	
			1928	Average 5 years	1928	Average 5 years
	tons. lb.	%	lb.	lb.	$ cts.	$ cts.
Corn	10 1,020	15·41	3,239	3,649	1 53	1 46
Sunflowers	17 20	14·77	5,025	4,479	1 11	1 26
Sunflowers and corn	9 200	14·80	2,694	3,505	1 75	1 47
Swede turnips	18 460	10·25	3,737	3,895	1 42	1 59
Green fodder hay	2 900	88·00	4,312	5,534	0 75	0 59
Clover	2 1,300	87·1	4,616	5,470	0 54	0 47
Alfalfa and clover	4 560	90·8	7,772	5,975	0 34	0 41
Timothy	3 180	88·4	5,463	4,486	0 42	0 48
	bush. lb.					
Oats	67 —	90·8	2,068	2,374	1 67	1 26
*Barley	36 24	90·7	1,589	1,636	1 35	1 85
**Peas	49 48	90·8	2,713	2,816	1 51	1 43
Wheat	30 6	88·9	1,605	1,607	2 16	2 00

*Four years average only.

**2 cuttings.

The above tables should be carefully studied by farmers who are interested in the production of the crops mentioned, as the yields shown cover a five-year period, including good and poor crop years. It will be noted in the first place that the average yield of fodder corn is 12·5 tons per acre only and that this corn was produced at a cost of $4.31 per ton. As corn rarely attains a sufficient degree of maturity to yield more than 15·41 per cent of dry matter, this crop does not appear to be profitable when sown alone in this district.

The sunflower crop, grown alone, gave a higher yield at an average cost of $3.44 per ton, with 14·77 per cent dry matter. The sunflower gives a satisfactory crop for cattle feeding when it is cut and ensiled before it contains a large quantity of fibre, and when it is given in reasonable quantity.

The mixture of sunflowers and corn gives a higher yield than corn alone and makes a more palatable ensilage, better relished by cattle than sunflower ensilage alone; however, at the average cost of $4.09 per ton it is rather an expensive feed.

Swede turnips, with an average yield of over 19 tons, at a cost of $3.05 per ton, may be considered a profitable crop for lower Quebec, especially when these roots are used to improve the ration for cattle as a succulent supplement for meal.

As regards the various grain crops, their average cost of production is much below their commercial value. This is due mainly to the high yields obtained, which are possible only when good methods of cultivation are followed.

As regards hay, it is well known that clover hay and mixed clover and alfalfa hay have a greater value than timothy hay. As already mentioned, the cost of production varies with the yield obtained and the feeding value depends to a certain extent on the degree of ripeness when cut and the manner in which it is cured.

As substitute for clover hay, the production of oats and pea hay at the average cost of $10.17 per ton may be considered profitable, as this crop may be ensiled or harvested for grain when the hay crop of the farm is sufficient.

ROTATIONS

Experiments were continued with three-, four- and five-year rotations, to ascertain the most profitable rotation for the production of grains and fodders used in the feeding of live stock.

THREE-YEAR ROTATION—YIELD AND COST OF PRODUCTION

Crops	Yield per acre in 1928	Cost per acre in 1928	Cost per ton or bushel in 1928	Average yield per acre, for 5 years	Average cost per ton or bushel for 5 years
		$ cts.	$ cts.		$ cts.
Longfellow corn	9 tons 1,320 pounds	47 63	4 93	12 tons 960 pounds	4 71
Sunflowers	17 tons 1,800 pounds	55 34	3 09	16 tons 80 pounds	3 46
Compton's Early corn	11 tons 700 pounds	50 19	4 42	—	—
Wheat	27 bush. 30 pounds	32 26	1 17	30 bush. 18 pounds	1 04
Clover	2 tons 1,160 pounds	26 03	10 09	2 tons 860 pounds	9 18

The above table shows the difference between sunflowers and fodder corn as regards the yield per acre and the cost of production per ton. The cost over a five-year period was $3.46 per ton for sunflowers when the yield was 16 tons and 80 pounds, as against $4.71 per ton for corn when the yield was 12 tons and 960 pounds.

It should be specially noted that clover hay was produced at an average cost of only $0.43 per ton more than in the four-year rotations, although the total cost of timothy and clover seed is charged to one crop only. This is often raised as an objection to short rotations.

FOUR-YEAR ROTATION

(Undrained land)

1st year—Swede turnips, corn and sunflowers.
2nd year—Wheat.
3rd year—Clover hay.
4th year—Timothy hay

YIELD AND COST OF PRODUCTION

Crops	Yield per acre in 1928	Cost per acre in 1928	Cost per ton or bushel in 1928	Average yield per acre, for 7 years	Average cost per ton or per bushel for 5 years
		$ cts.	$ cts.		$ cts.
Swede turnips	8 tons 120 pounds	52 98	6 57	13 tons 820 pounds	4 26
Corn	6 tons 1,660 pounds	44 34	6 49	8 tons 440 pounds	5 80
Sunflowers	8 tons 1,320 pounds	44 90	5 18	14 tons 380 pounds	3 81
Wheat	20 bush. 44 pounds	33 19	1 21	23 bush. 7 pounds	1 44
Clover	2 tons 1,200 pounds	25 36	9 75	2 tons 122 pounds	8 75
Timothy	3 tons 80 pounds	19 43	6 39	2 tons 680 pounds	8 11

FOUR-YEAR ROTATION

(Drained land)

YIELD AND COST OF PRODUCTION

Crops	Yield per acre in 1928	Cost per acre in 1928	Cost per ton or bushel in 1928	Average yield per acre, for 7 years	Average cost per ton or per bushel for 5 years
		$ cts.	$ cts.		$ cts.
Swede turnips	18 tons 460 pounds	53 19	2 92	15 tons 1,945 pounds	3 52
Corn	9 tons 1,340 pounds	50 21	5 19	10 tons 1,460 pounds	4 64
Sunflowers	16 tons 240 pounds	55 43	3 44	4 tons 285 pounds	3 29
Wheat	31 bush. 5 pounds	37 24	1 19	31 bush. 32 pounds	1 09
Clover	2 tons 1,300 pounds	24 68	9 30	2 tons 1,120 pounds	8 73
Timothy	3 tons	19 42	6 48	2 tons 600 pounds	7 63

FOUR-YEAR ROTATION—DRAINED AND UNDRAINED LAND

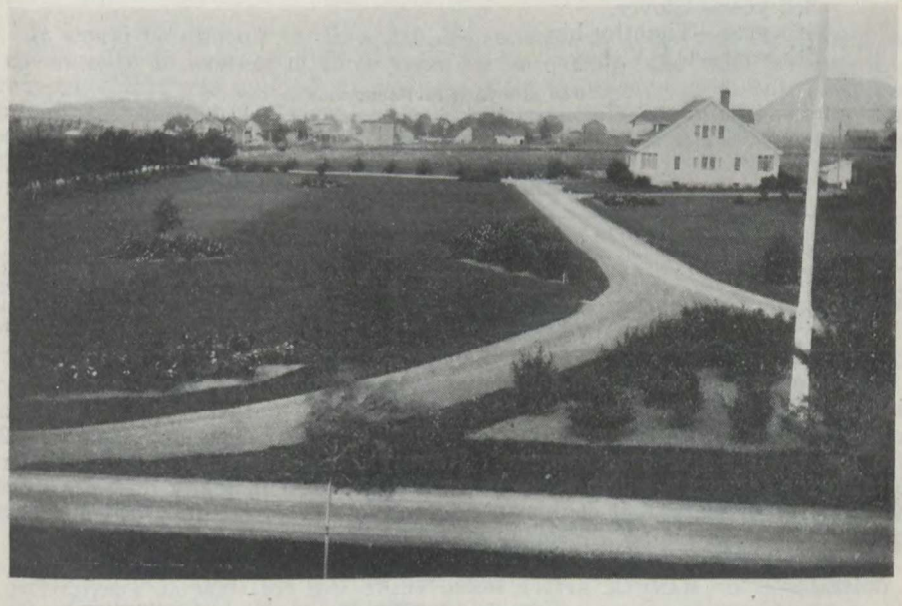
Crops	Drained land		Undrained land	
	Average yield per acre, for 7 years	Average cost per ton or per bushel for 5 years	Average yield per acre for 7 years	Average cost per ton or per bushel for 5 years
		$ cts.		$ cts.
Swede turnips	15 tons 1,945 pounds	3 52	13 tons 820 pounds	4 26
Corn	10 tons 1,460 pounds	4 64	8 tons 440 pounds	5 80
Sunflowers	4 tons 285 pounds	3 29	14 tons 380 pounds	3 81
Wheat	31 bush. 32 pounds	1 09	23 bush. 7 pounds	1 44
Clover	2 tons 1,120 pounds	8 73	2 tons 122 pounds	8 75
Timothy	2 tons 600 pounds	7 63	2 tons 680 pounds	8 11

The three above tables show in the first place that drainage causes a considerable increase in production and a decrease in the cost of production of intertilled or hoed crops. Over a five-year period, swede turnips were grown at 74 cents less per ton; corn at $1.16 less per ton; and sunflowers at 52 cents less per ton and wheat at 35 cents less per bushel.

This experiment shows that underdrainage of land may be profiable when such land suffers from an excess of moisture and when the drainage cannot be done by open ditches.

On the other hand, if the yield of intertilled crops and cereals has been increased by underdrainage, practically no difference was noticed, at least in this case, in clover and timothy crops.

This kind of rotation may be very suitable for farms which require a certain quantity of timothy hay and which have a sufficient area in permanent pastures.



Part of the lawn on the Ste. Anne Station.

FOUR-YEAR ROTATION

(Area, 27 acres)

1st year—Corn and sunflower mixture.
2nd year—Oats.
3rd year—Alfalfa and clover mixture.
4th year—Pasture.

YIELD AND COST OF PRODUCTION

Crops	Yield per acre in 1928	Cost per acre in 1928	Cost per ton or per bushel in 1928	Average yield for 7 years
		$ cts.	$ cts.	
Corn and sunflower	9 tons 200 pounds	46 77	5 13	13 tons 940 pounds
Oats	67 bush.	34 49	0 51	76 bush. 40 pounds
Alfalfa and clover (1)	4 tons 360 pounds	26 58	6 36	3 tons 480 pounds
Alfalfa and clover hay and pasture (2)	2 tons 1,940 pounds	21 31	7 18	1,860 pounds.

(1) 2 cuttings.
(2) 1·5 cows per acre of pasture.

This rotation was started to ascertain the advantages of a shorter rotation with the fourth year in pasture where there is no permanent pasture.

The results obtained, with the exception of the corn and sunflower crop, show that this rotation should be very popular on dairy farms. Large yields of fodder may be obtained, especially clover and grains, as well as a very good pasture the fourth year.

FIVE-YEAR ROTATION

(Undrained land)

1st year—Swede turnips.
2nd year—Wheat.
3rd year—Clover.
4th year—Timothy hay.
5th year—O.P.V. hay.

YIELD AND COST OF PRODUCTION

Crops	Yield per acre in 1928	Cost per acre in 1928	Cost per ton or per bushel in 1928	Average yield for 5 years
		$ cts.	$ cts.	
Oats and pea hay	2 tons 900 pounds.	32 17	13 13	3 tons 300 pounds
Swede turnips	7 tons 1,600 pounds.	52 23	6 70	13 tons 1,680 pounds
Wheat	18 bush.	30 79	1 71	20 bush. 36 pounds
Clover	2 tons 1,000 pounds.	24 19	9 68	2 tons 620 pounds
Timothy	3 tons.	25 03	8 34	2 tons 920 pounds

It is shown in the above table that swede turnips and wheat gave a poor yield in 1928. This was due to the cold and wet spring, unfavourable for the land in this rotation, which is heavy clay, very hard to drain. The low yields in 1928 also lowered the five-year average. However, this five-year rotation is very suitable for farms on which there is no silo and also in many districts where labour is rather scarce. It enables one to obtain a great quantity of leguminous fodder while maintaining the soil in good fertility.

COMPARISON OF MANURE, SPENT HOPS, YEAST AND COMMERCIAL FERTILIZERS

The object of this experiment is to determine the possibility of growing forage crops, grain and hay by total or partial substitution of other fertilizers

for farmyard manure on poor gravelly and sandy soil, also to compare spent hops and yeast with manure and commercial fertilizers. This experiment was conducted on a four-year rotation covering 20 acres.

Plot 1: 10 tons spent hops and yeast were applied to the first-year crop which was in pea and oats hay, and 10 tons on oat stubble the following year.

Plot 2: 10 tons manure were applied to the oats and pea hay crop the first year and 10 tons on the oat stubble the following year.

Plot 3: 8 tons manure and 150 pounds acid phosphate were applied to the first-year crop; no fertilizers were applied on the second-year crop; 150 pounds acid phosphate and 50 pounds muriate of potash were applied to the third-year crop.

Plot 4: 100 pounds nitrate of soda, 200 pounds acid phosphate and 50 pounds muriate of potash were applied to the first-year crop; 50 pounds of nitrate of soda and 150 pounds acid phosphate were applied to the second-year crop; 50 pounds muriate of potash and 150 pounds acid phosphate were applied to the third-year crop.

Plot 5 was used as check plot and received no fertilizers or manure.

FERTILIZER EXPERIMENT

AVERAGE YIELD FOR THREE YEARS

Plot	Treatment or rotation	First year oat and pea hay	Second year oats	Third year clover hay	Fourth year timothy hay
		lb.	bush. lb.	lb.	lb.
1	Spent hops and yeast	3,203	52 5	4,075 (1)	.....
2	Manure	2,357	33 26	2,625	2,646
3	Manure and fertilizers	2,594	33 13	3,041	2,654
4	Commercial fertilizers	2,572	28 23	2,250	1,958
5	No manure or fertilizers	1,137	20 8	408	814

(1) One year yield.

It would be difficult to draw definite conclusions from this experiment as it covers only an average of three years for each crop. However, as each different treatment was applied on one-acre plots the results are fairly accurate. They show that the use of chemical fertilizers, especially in addition to manure, may increase the yields in many cases and lower the cost of production of the crops.

These experiments offer interesting possibilities.

LIST OF PROJECTS UNDERTAKEN FOR THE FIELD HUSBANDRY DIVISION

F 4—Three-year rotation—Potatoes; oats; clover.
F 5—Three-year rotation—Roots; wheat; clover.
F 7—Three-year rotation—Sunflowers and corn; wheat; clover.
F 16—Four-year rotation—Corn; sunflowers and roots; wheat; clover and timothy.
F 24—Four-year rotation—Corn and sunflower; oats; clover and alfalfa; pasture.
F 30—Five-year rotation—Roots; wheat; clover; timothy, O.P.V.
F 67—Renovation of pastures.
F 72—Drained and undrained land.
F 79—Manure and commercial fertilizers vs. no manure.
F 81—Commercial fertilizers and manure for hay.
F 86—Yield of various grain crops and profits.
F 88—Yields of roots and silage crops and profits.
F 91—Cost of production of farm crops.
F 305—Meteorological records.

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HORTICULTURE

TREE FRUITS

APPLE—VARIETY TEST

The accumulation of snow in various parts of the orchard caused rather heavy damage during the winter of 1928. Forty-four apple trees injured by snow had to be replaced. On May 20, a layer of snow 12 to 18 inches deep still covered the soil between four rows of trees in the western part of the orchard, where the apple trees received the most injury. Blossoms were plentiful, but the blossoming period was four days later than in the preceding year.

The total crop of apples amounted to 715 barrels in 1928. The average yield for the last three years is 513 barrels.

Four trees of the McMahan White variety, planted in 1915, gave the heaviest crop, i.e. 40¼ bushels.

The following varieties gave good results and may be recommended for this district. The yield given is for two trees and represents the average yield of the last three years:—

YIELD OF DIFFERENT VARITIES OF APPLES

Variety	Season	Date of plantation	Average yield of three years	
			bush.	gal.
Crimson Beauty	Summer	1915	3	2
Yellow Transparent	Summer	1914	6	–
Duchess	Late summer	1913	4	4
Melba	Early fall	1913	4	–
Lobo	Fall to mid-winter	1913	5	2
Wealthy	Fall to late winter	1914	7	1
Barred Fameuse	Fall to mid-winter	1915	9	2
McIntosh	Fall to mid-winter	1915	7	6
Red Fameuse	Fall to mid-winter	1918	1	4

A Melba apple tree.

The following results were given by some of the best varieties originated by the Horticultural Division, Central Experimental Farm, Ottawa. The yields given in this table represent one year crop for two trees.

YIELD OF VARIETIES ORIGINATED IN THE HORTICULTURAL DIVISION, OTTAWA

Varieties	Season	Year of plantation	Yield	
			bush.	gal.
Joyce	October to late November	1915	6	6
Pedro	" "	1916	8	..
Brock	Mid-November to mid-February	1913	8	6
Sandow	Late November to mid-February	1915	9	4
Elmer	December to mid-March	1915	8	2
Niobe	January to late March	1913	7	..
Bruno	Late November to April	1913	6	..

APPLE—THINNING EXPERIMENT

Fourteen apple trees of seven different varieties were used in this experiment. On seven trees, all the apples were removed with the exception of one left on each spur. The thinning was done when the apples were one inch in diameter.

The seven other trees were left unthinned and used as checks. The result of the last two years are as follows:—

RESULTS OF THINNING EXPERIMENT

Thinned Trees

Variety	Uniformity as to colour and size	Quality		Total yield, 2-year average
		No. 1	No. 2	
		gal.	gal.	gal.
Alexander	Good	50	14	64
Wolf River	"	56	18	74
Fameuse	"	44	18	62
Wealthy	"	26	8	34
Yellow Transparent	"	44	22	66
Duchess	"	28	8	36
North Star	"	36	10	46

Unthinned Trees

Alexander	Fairly good	48	16	64
Wolf River	"	52	18	70
Fameuse	Medium	60	32	92
Wealthy	"	36	18	54
Yellow Transparent	"	42	26	68
Duchess	"	28	14	42
North Star	"	24	18	42

PLUM—TEST OF VARIETIES

Twenty-six varieties, a total of 113 plum trees, were tested. Twenty of these trees were planted in 1923. The plum crop in 1928 amounted to 395 gallons against an average for the last two years of 451½ gallons.

The following varieties are among the best for the district, considering productivity, quality of the fruit and hardiness of the trees. The yields given in the following table are the average production of one plum tree for the last three years:—

PLUM—RESULTS OF TEST OF VARIETIES

Variety	Colour of fruit	Date of ripening	Total yield for 3 years
			gal.
Green Gage	Greenish yellow	Sept. 15–18	8½
Bradshaw	Purplish red	" 16–20	10½
Damson	Blue	" 20–25	7½
Reine Claude Montmorency	Yellow	" 20–25	5½
Lombard	Purplish red	" 25–27	5½
Hudson River	Dark red	" 25–30	29
Latchford	Purple	" 30–Oct. 5	29½
John A	Purple	" 30– " 8	23½

CHERRY—TEST OF VARIETIES

Ten cherry trees were destroyed by snow during the winter of 1928. They were replaced by trees of the French cherry, one of the best varieties for this district.

Cherry trees had an abundant bloom, but the yield was low, on account of the cold and wet weather during flowering time.

The two varieties, Large Montmorency and French Cherry, are the only varieties that gave a reasonable crop, the yield for one tree being as follows:—

Large Montmorency	3½ gallons
French Cherry	3 "

PEAR—TEST OF VARIETIES

Fourteen pear trees of the Flemish Beauty, Clapp Favourite, and Bartlett varieties were planted in the orchard, nine in 1919, and six in 1922.

All the pear trees grew vigorously and ripened their wood well. All withstood the cold well. Thirteen trees fruited this year; the best yielders were as follows:—

	Per tree
Flemish Beauty	1½ bushels
Clapp Favorite	6 gallons
Bartlett	2 "

SPRAYING AND DUSTING FRUIT TREES

Six sprayings of sulphur spray were given to the fruit trees during the last season. The first spraying was done on May 20. The solution was made up of 10 gallons of commercial sulphur spray for 90 gallons of water with 5 pounds lead arsenate and 20 pounds of freshly slaked lime added. A second spraying with the same solution was made on November 8. The object of these two sprayings is to check the oyster scale. The results obtained were more satisfactory than those given by lime applications.

The four other sprayings were made as follows:—

A As soon as the leaves appear.
B Immediately before the opening of the flowers.
C As soon as the flowers fall.
D About fifteen days after C.

When the trees have all their leaves, the concentrated sulphur spray is diluted at the rate of 3 gallons of commercial spray for 100 gallons of water.

SMALL FRUITS

RASPBERRY—TEST OF VARIETIES

The twelve varieties of raspberry under test were planted on plots measuring 72 feet in area, the plants being placed at three by six feet. An application of rotted manure is made every two years, and the plot is cultivated and weeded.

The results obtained with six varieties suitable for the district are as follows:—

RASPBERRY—RESULTS OF VARIETY TEST

Variety	Date of first picking	Yield per acre	
		1928	Three-year average
		lb.	lb.
Cuthbert	July 26	2,970	2,102
Newman No. 23	" 29	4,510	5,316
Brighton	Aug. 1	3,520	3,520
Superlative	" 2	4,510	5,466
Latham	" 7	2,915	5,133
Reine Dorée	" 8	3,555	3,553

STRAWBERRY—TEST OF VARIETIES

The four varieties of strawberry under test during the last five years have not given very satisfactory results, which is due, to a large extent, to the rather unfavourable location in which they were grown.

The average yield for five years is shown in the following table:—

STRAWBERRY—RESULTS OF VARIETY TEST

Variety	Type of flower	Size of the fruit	Date of 1st picking	Average yield per acre for five years
				lb.
Portia	Imperfect	Large	July 12	4,690
Cassandra	Perfect	Medium	" 19	4,520
Hermia	"	"	" 9	1,930
Lavinia	"	"	" 13	1,520

CURRANTS—TEST OF VARIETIES

Each variety of currants occupies a plot thirty-six long by six feet wide with the plants three feet apart. The following varieties were satisfactory:—

CURRANTS—RESULTS OF TEST VARIETIES

Black varieties	Date of 1st picking	Size of fruit	Average yield per acre for 5 years
			lb.
Saunders	Aug. 13	Medium	4,235
Kerry	" 10	Large	3,434
Magnus	" 8	"	3,025
White varieties			
Large White	July 28	Large	5,577
White Dutch	" 28	Medium	5,164
Red varieites			
Cumberland	Aug. 8	Medium	5,216
Red Dutch	" 6	Small to Medium	5,118
Red Grape	" 7	Large	4,501

GOOSEBERRIES—TEST OF VARIETIES

The four varieties tested during the last five years gave the following results:—

GOOSEBERRIES—RESULTS OF TEST OF VARIETIES

Varieties	Date of 1st picking	Size of fruit	Average yield for 5 years
			lb.
Mabel	Aug. 15	Medium to large.	3,965
Industry	" 12	"	3,836
Rideau	" 12	Medium	3,675
Smith Improved	" 16	"	2,371

FLOWERS

ANNUALS—TEST OF VARIETIES

Two hundred and fifty varieties of flower seeds were under test. They were sown in the open on May 10, except Daisies, Dahlias, Marvel of Peru, Sage, Castor-oil plant and Stocks, which were sown in hotbeds on April 11 and transplanted in the garden on June 4.

Dahlias started to bloom on July 27 and were an attractive group of flowers. The seed was from the Double Cactus, Double Dahlias, Mammoth and Single Dahlias varieties.

Stocks bloomed on August 17 and gave a good bloom until October 20.

The Delphinium, Phlox, Scabious, Helichrysum, Chrysanthemum, Salpiglossis, Nicotiana, Cosmos and Zinnia were in bloom from the end of July to October 15.

The California Poppy, Iberis, Accroclinium, Balsam, Clarkia and Portulaca gave the first flowers.

Sweet peas bloomed in the first days of July; the bloom lasted until October 12, but was slightly damaged by frost on September 29. Sweet peas were sown on May 10.

TULIPS—TEST OF VARIETIES

Over fifty varieties or species of tulips were grown on this Station in the last eight years. They belonged to five different groups: Early single, Early double, Darwin, Cottage and Parrot tulip.

Darwin tulips, though blooming later than the others, produce flowers with more delicate colours, richer than in the other groups.

Some of the hardiest and best varieties are mentioned in the following table:—

TULIPS—RESULTS OF TEST OF VARIETIES

Varieties and season	Colour	Date of blooming	Duration of bloom
			days
Artus, single, early	Red	May 13	12
Bright Vermillon, single, early	Vermillon	" 12	12
Chrysolora, single, early	Yellow	" 11	11
Snowball, double, early	White	" 12	15
Imperator Rubrorum, double, early	Bright red	" 13	15
Murillo, double, early	Pink	" 12	16
Europe, Darwin	Salmon red	" 24	17
Baronne de la Tonnaye, Darwin	Bright pink	" 25	16
Farncome Sanders, Darwin	Bright red	" 23	17
Gesneriana Lutea, cottage	Yellow	" 24	15
La Candeur, cottage	White becoming pink	" 22	13
Bright crimson, parrot	Carmine red	" 22	14
Lutea Major, parrot	Yellow	" 24	15

CHINA ASTERS—TEST OF VARIETIES

The seed of fifteen varieties or strains of China Asters were sown in hotbeds on April 10. The plants were set out on June 4. The growth was good and the bloom plentiful from July 23 until October 2.

The following varieties gave good results in each of the last five years:—

CHINA ASTERS—RESULTS OF TEST OF VARIETIES

Variety and season	Colour	Duration of bloom
		days
Snow Queen, early	White	30 to 35
Queen of the Market, early	Varied	35 to 40
Ostrich Plume, semi-early	"	35 to 40
Crego, semi-early	"	40 to 45
American Beauty, late	"	30 to 35
Vick's Late Branching, late	"	35 to 40

LIST OF PROJECTS UNDERTAKEN FOR THE HORTICULTURAL DIVISION

TREE FRUITS

H 33—Apple—Test of varieties.
H 29—Apple—Experiment on keeping.
H 413—Apple—Thinning experiment.
H 44—Pears—Test of varieties.
H 48—Plums—Test of varieties.
H 35—Cherries—Test of varieties.
H 667—Cultural and fertilizer experiments in the orchard.
H 369—Spraying and dusting.

SMALL FRUITS

H 11—Raspberries—Test of varieties.
H 21—Strawberries—Test of varieties.
H 2—Blackberries—Test of varieties.
H 4—Currants—Test of red, black and white varieties.
H 6—Gooseberries—Test of varieties.

FLOWERS

H 290—Tulips—Treated as annuals—Test of varieties.
H 263—Daisies—Annuals—Test of varieties.
H 261—Annuals—Test of varieties.

VEGETABLES

BEANS—TEST OF VARIETIES

Twenty-five varieties of beans have been grown for over five years. The object of this test is to ascertain the earliest varieties as well as the yield of each. The beans are grown in rows 30 feet long and 30 inches apart; they are planted 2 inches apart in the rows.

The average results for a five-year period with varieties of three different seasons are as follows:—

BEANS—RESULTS OF TEST OF VARIETIES

Variety	Season	Colour of pods	Days to ripen	Average yield for 5 years
				gal.
Grennel Rust proof	Early	Yellow	53	4,350
Currie Rust Proof	"	"	55	4,930
Masterpiece	Mid-season	Green	59	6,525
Canadian Wonder	"	"	62	4,640
Hudson Longpod	Late	Yellow	70	4,930
Refugee Green pod	"	Green	74	6,233

BEETS—TEST OF VARIETIES

The object of the beet variety test is to ascertain the earliest and best-yielding varieties, as well as the quality of the beets.

The fifteen varieties under test for over five years were grown in plots 30 feet long and 30 inches apart. The plants were thinned to two or three inches.

The results given by the six best varieties are given in the following table:—

BEETS—RESULTS OF TEST OF VARIETIES

Varieties	Yield per plot in 1928	Average yield for 5 years		Total per acre
		Unmarketable	Marketable	
	lb.	bush.	bush.	bush.
Detroit Dark Red	112	235	770	1,005
Early Wonder	75	215	717	932
Crimson Globe	97	228	704	932
Early Flat Egyptian	90	216	712	928
Detroit half-long	65	208	622	830
Dark Red Ball	82	172	582	754

The " Early Flat Egyptian " variety is very early and is the best one to grow for early marketing. For the main crop, the Detroit Dark Red is preferable.

PEAS—TEST OF VARIETIES

Seventeen varieties of peas were sown on May 9. Each plot was 30 feet long and 30 inches apart. The peas are one inch apart in the row.

The yield in 1928 and the average yield per acre for a five-year period are given in the following table:—

PEAS—RESULTS OF TEST OF VARIETIES

Varieties	Length of pods	Date ready for use	Yield per plot in 1928	Average yield per acre for 5 years
	in.		gal.	gal.
Pioneer	3¼	July 18....	5	2,958
Potlach	4	" 27....	6	2,958
Gradus or American Wonder	3	" 23....	3½	2,900
Little Wonder	2½	" 20....	3½	2,842
Lincoln	3¼	" 20....	4¼	2,784
Alaska	2¾	" 9....	4½	2,697
Thomas Laxton	2½	" 13....	5¼	2,610
Daisy	3	" 24....	3½	2,581
Greogry x English Wonder	2½	" 27....	5¾	2,523
McLean Advancer	3	" 23....	3	2,523
Blue Bantam	3	" 14....	4½	2,378
English Wonder	2½	" 21....	5½	2,211
Stratagem	3½	" 24....	3¾	2,204
Laxtonian	3¼	" 16....	4	2,204
Pedigree Extra Early	2½	" 10....	3¾	2,066
Early Morn	3	" 16....	3¾	2,010
English Champion	2½	Aug. 2....	3½	1,921

PARSNIPS—TEST OF VARIETIES

The seed used in the test of varieties of parsnips was of the Cooper Champion and Hollow Crown varieties; this test has been conducted for over five years. The Hollow Crown variety is to be preferred to the other one. They were sown on May 10.

The results obtained were as follows:—

PARSNIPS—RESULTS OF TEST OF VARIETIES

Varieties	Date ready for use	Average yield for 5 years					
		Unmarketable		Marketable		Total yield per acre	
		bush.	lb.	bush.	lb.	bush.	lb.
Hollow crown	July 25....	106	—	313	35	419	35
Cooper Champion	" 31....	98	—	276	37	374	37

SQUASH—TEST OF VARIETIES

Hubbard, Kitchenette and Delicious are three varieties of squash recommended for this district. It is advisable to use the last named variety at the beginning of the winter.

Seven varieties were under test; there were three hills for each variety 9 feet apart each way.

The results obtained in 1928 were as follows:—

SQUASH—RESULTS OF TEST OF VARIETIES

Varieties	Source	Yield in 1928	
		Plot	Per acre
		lb.	lb.
Green Hubbard	Graham	77	22,770
Golden Hubbard	McDonald	67	18,360
Kitchenette	McDonald	45	17,100
Golden Hubbard	Harris	50	15,480
Long White	Ewing	48	11,340
Delicious	Graham	50	9,720
New Acorn	Buckbee	32	8,280

PUMPKINS—TEST OF VARIETIES

Five varieties were under test in 1928. The seed was sown in hills 9 feet apart each way, at the rate of three hills for each variety.

Small Sugar and King of the Mammoth are the two best varieties for table use; the flesh is sweet and has a fine texture.

The crop obtained in 1928 as well as the average results for five years from the five varieties of pumpkins tested are given in the following table:—

PUMPKINS—RESULT OF TEST OF VARIETIES

Varieties	Yield per plot 1928	Average yield per acre for 5 years
	lb.	lb.
Connecticut Field	155	39,150
King of the Mammoth	193	38,700
Large Cheese	107	20,070
Small Sugar	106	19,710
Winter Luxury	94	19,620

RADISHES—TEST OF VARIETIES

Nine varieties of radishes were sown on May 8 in plots 30 feet long and 15 inches apart.

The following results were obtained:—

RADISHES—RESULTS OF TEST OF VARIETIES

Varieties	Date ready for use	Yield per plot in 1928	Average yield for 5 years
		bunches	bunches
Twenty Days	June 12....	10	8·5
White Olive	" 13....	20	15·2
Icicle	" 14....	6	8·5
White Tip Scarlet	" 14....	5	7·4
Vick Scarlet Globe	" 14....	4	9·0
French Breakfast	" 15....	6	7·4
Early Scarlet Globe	" 15....	7	8·5
Saxa	" 15....	8	7·8
Giant Butter	" 15....	9	8·0

A bunch contains 20 radishes.

TURNIPS—TEST OF VARIETIES

The following varieties are under test at this Station: Golden Ball, Snowball, Red Top Milan and Purple Top Milan. The last named variety is the best of the four. It is very early, the roots are flat and white, the top is purple and the turnips have a good size and a good quality.

The yield given by this plot in 1928 was 15 bunches of 5 turnips each.

SALSIFY—TEST OF VARIETIES

Mammoth Sandwich Island and Long White are the two varieties of salsify grown at this Station for five years. The Mammoth Sandwich Island variety is preferable.

SWISS CHARD—TEST OF VARIETIES

The following varieties of Swiss chard have been under test for five years: Lucullus, Silver Leaf and Fordhook. These varieties made a strong and vigorous growth.

The long and crisp stems of the Lucullus variety are ten to eleven inches high. The season of use is longer for this variety than for the Silver Leaf and Fordhook varieties, the stems of which are more stringy.

SPINACH—TEST OF VARIETIES

The seed of twelve varieties of spinach was sown on May 10.

The most popular varieties are King of Denmark and Princess Juliana. The season for the King of Denmark is of fifteen days' duration and for the Princess Juliana thirteen days. The latter is a better yielder.

The New Zealand variety differs from the other varieties. It produces a large number of side stems and yields a large quantity of leaves during the best part of the summer. The plants withstand warm weather well and go to seed late.

CUCUMBERS—TEST OF VARIETIES

Twelve varieties were tested during five years. The varieties recommended are as follows: White Arctic, White Spine and Long Green. The varieties are in order of earliness and yield.

PEPPERS—TEST OF VARIETIES

Harris Early and New Giant are the two varieties, out of five under test, which gave the highest yields for a five-year period.

Harris Early is the earliest and gives the best results. The seed was sown in hotbeds on April 15 and the peppers were ready for use on August 20.

CAULIFLOWERS—TEST OF VARIETIES

Early Snowball and Veitch Giant Autumn are two good varieties. They are the most profitable ones of the eighteen varieties under test. The average weight of two heads of the Snowball variety was 4½ pounds; they were ready for use on July 20. The weight of two heads of the Veitch Autumn Giant variety was 6¼ pounds, and they were ready for use on August 10.

The plants were set out on May 18.

KOHL RABI—TEST OF VARIETIES

Two varieties were under test. The White Vienna, which has been grown for five successive years, is very satisfactory for early marketing and it is preferred to the Purple Vienna.

CORN—TEST OF VARIETIES

Seventeen varieties of corn were grown in plots 66 feet long and 3 feet apart.

The object of these tests is to determine the earliest varieties producing good quality corn for early consumption.

Of the varieties tested, Pickaninny and Banting are the earliest and are among the best varieties. The stalks are very small, being only 4 feet long, and the ears are also small.

The results given by the 1928 plot, sown on June 1, as well as the results for five years, are as follows:—

CORN—RESULTS OF TEST OF VARIETIES

Varieties	Source	Date ready for use	Yield from the 1928 plot	Average yield per acre for 7 years
			ears	ears
Golden Bantam	Graham	Sept. 2	80	18,876
Alpha	Ferry	Aug. 18	68	17,726
60 days	Child	" 17	57	17,424
Early Malcolm	C.E.F.	" 27	52	17,182
Pickaninny	C.E.F.	" 13	76	16,940
Golden Bantam	Moore	" 28	108	16,456
Yellow Whipple	Harris	" 28	43	15,004
Yellow Meadow	Rennie	" 30	53	14,278
Golden Bantam	James	" 26	58	13,850
Banting	C.E.F.	" 15	48	14,612
Mayflower Early	McDonald	" 25	34	12,705
Howling Mob	Burpee	Sept. 4	26	11,374
Golden Giant	Rennie	" 1	40	10,648
Burbank	Burbank	" 9	16	9,438
Evergreen Bantam	Graham	" 19	29	5,203
Stowell Evergreen	Graham	Oct. 1	14	2,480
Early Adam	Ferry	Aug. 18	55	9,608

WATERMELONS—TEST OF VARIETIES

Only one watermelon variety, Cole Early, was grown. Three hills, nine feet apart each way, yielded 15 pounds of melons. The seed was sown on May 23 and the crop harvested on October 1.

BRUSSELS SPROUTS—TEST OF VARIETIES

Four varieties of Brussels sprouts were sown in hotbeds on April 12. The plot was 30 feet long and the plants 18 inches apart in the rows.

Paris Market gave the highest yield, 2¾ gallons of small heads. Improved Long Island yielded 2½ gallons. These are the best varieties and are recommended.

LETTUCE—TEST OF VARIETIES

Over twenty-five varieties of lettuce were tested during a five-year period. From the results obtained, the following varieties are recommended as the best among those tested: Loose-leaf crisp lettuce, Grand Rapids; the latter variety makes a very rapid growth. Curled Simpson is also a good variety on account of its tender leaves and its good quality; Head lettuce, Crisp-as-Ice, Cos lettuce, White Paris.

MUSKMELONS—TEST OF VARIETIES

Thirteen varieties of muskmelons were under test. They were sown in hotbeds on April 5. Three of these gave a fair quantity of ripe fruit, viz: Emerald Gem, Golden Champlain and Irondequoit.

The Emerald Gem variety gave the first ripe melons, which were ready for use on September 12.

ONIONS—TEST OF VARIETIES

The seed of seventeen varieties and strains of onions was sown in hotbeds and the plants set out two inches apart, in plots thirty feet long.

The yield given by the plot in 1928 and the average yield per acre for five consecutive years are given in the following table:—

ONIONS—RESULTS OF TEST OF VARIETIES

Varieties	Source	Yield from the plot in 1928	Average yield per acre for 5 years
		lb.	lb.
Ailsa Craig	Graham	85	70,664
Giant Prizetaker	Graham	96	70,664
Yellow Giant Prizetaker	Steele Briggs	88	69,696
Yellow Globe Southport	McKenzie	85	60,984
Red Globe Selected	Graham	84	60,016
Danvers Yellow Globe	Graham	70	59,048
Danvers Yellow Globe	Steele Briggs	85	57,112
Southport Red Globe	Steele Briggs	90	55,176
Southport White Globe	Steele Briggs	73	53,240
Wethersfield Large Red	C.E.F.	67	52,272
Wethersfield Extra Red Selected	McDonald	73	52,272
Flat Red Very Early	Graham	74	45,496
Australian Brown	McDonald	53	45,496
Danvers Yellow Globe	C.E.F.	62	44,496
Silver King	Graham	45	42,192
Ebenezer	Schell	62	39,688
White Barletta	McDonald	28	35,090

TRANSPLANTING VS. SOWING

The object of this experiment is to determine the comparative advantages of sowing onion seed in hotbeds and transplanting the young plants in the open, and sowing seed of the same variety in the open. Two varieties of onions were used in this experiment.

The yield given by the plots in 1928 as well as the average yield per acre for five years are given in the following table:—

ONIONS—RESULTS OF TRANSPLANTING VS SOWING TEST

Variety and method of sowing	Yield from the plot in 1928		Average yield per acre for 5 years		Total
	Ripe	Elongated	Ripe	Elongated	
	lb.	lb.	lb.	lb.	lb.
Large Red Wethersfield.....Open	38	11	8,326	27,006	35,332
Large Red Wethersfield.....Hotbed	73	.....	.....	53,966	53,966
Danvers Yellow Globe.....Open	36	3	8,907	23,522	32,429
Danvers Yellow Globe.....Hotbed	70	.....	.....	57,112	57,112

The 1928 sowings were made on the following dates: in the open on May 8, in hotbeds on April 13. The plot was 30 feet long.

LEEKS—TEST OF VARIETIES

The two varieties under test gave the following results:—

LEEKS—RESULTS OF TEST OF VARIETIES

Varieties	Average yield per acre for 5 years		
	Small	Large	Total
	lb.	lb.	lb.
London Flag	15,488	50,568	65,885
Carentan Monster	13,068	47,916	60,984

These are two excellent varieties that may be recommended.

CABBAGE—TEST OF VARIETIES

Seventeen varieties and strains of cabbage were used in this test. These tests have now been conducted for five successive years and the results obtained enable us to recommend the following varieties:—

CABBAGE—RESULTS OF TEST OF VARIETIES

Varieties	Season	Average weight of 10 heads	
		lb.	oz
Golden Acre	Early	22	8
Jersey Wakefield	"	32	4
Copenhagen Market	"	40	—
Enkhuisen Glory	Mid-season	43	12
Summer Roundhead	"	60	6
Danish Ballhead	Late	69	4
Danish Firm Head	"	71	—

PARSLEY—TEST OF VARIETIES

The two varieties of parsley tested, Triple Curled and Moss Curled, are equally satisfactory; their growth is strong and vigorous, there is an abundance of curled leaves, and they are very popular for adorning dishes.

POTATOES

SPROUTED VS. UNSPROUTED TUBERS

The object of this experiment is to ascertain the effect of sprouted tubers on the total crop as well as on the production of early potatoes.

The following varieties are used in this experiment: Irish Cobbler, an early variety, and Green Mountain, a late variety. The seed was sown on May 10.

Unsprouted tubers were from potatoes which had been kept in a dormant condition as much as possible. In order to obtain well-developed sprouts, the potatoes were exposed to diffused light for five or six weeks, the light was gradually increased, and the germs produced were short and strong. The temperature was kept at between 40 to 45 degrees F.

The average yield for a five-year period as well as the yield in 1928 are given in the following table:—

POTATOES—SPROUTED VS UNSPROUTED TUBERS

Quality	Irish Cobbler								Green Mountain							
	Sprouted				Unsprouted				Sprouted				Unsprouted			
	1928		5-year average		1928		5-year average		1928		5-year average		1928		5-year average	
	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.
Marketable	251	32	290	0	242	0	256	0	466	24	390	0	250	48	271	0
Unmarketable	66	0	73	38	57	12	76	0	22	56	58	0	52	48	68	0
Total	317	32	363	38	299	12	332	0	489	20	448	0	402	30	339	0
Date ready for use	July 20				July 28				July 28				August 1			

DIFFERENT DATES OF PLANTING

Irish Cobbler and Green Mountain potatoes were planted at ten-day intervals, beginning on May 6. The object of this experiment is to determine the best date to plant potatoes in this district, for yield, quality and vigorous growth.

The average yields for a five-year period are as follows:—

POTATOES—RESULTS OF DIFFERENT DATES OF PLANTING

Date of planting	Irish Cobbler						Green Mountain					
	Unmarketable		Marketable		Total		Unmarketable		Marketable		Total	
	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.
May 6	60	24	222	0	282	24	62	36	296	0	358	36
May 16	51	18	257	36	308	54	65	9	313	0	378	9
May 26	43	0	378	30	429	38	58	16	359	0	417	16
June 5	68	0	264	0	332	0	80	16	290	0	370	12
June 15	70	36	207	0	277	36	87	24	236	0	323	24

TEST OF VARIETIES

The results given in the following table are the average yields given during five successive years by the five varieties of potatoes under test:—

POTATOES—RESULTS OF TEST OF VARIETIES

Varieties	Average yield per acre					
	Unmarketable		Marketable		Total for a 5-year period	
	bush.	lb.	bush.	lb.	bush.	lb.
Green Mountain	94	9	391	0	485	9
Gold Coin	96	0	325	22	421	22
Irish Cobbler	98	0	319	16	417	16
Rose Early	77	26	208	30	285	56
Rochester Rose	57	40	169	9	233	49

TOMATOES—TEST OF VARIETIES

Sixty-three varieties or strains of tomatoes were tested this year. The seed was sown in hotbeds on March 23 and the plants were set out on May 26.

All the varieties were reduced to a single stem and tied to a stake. The lateral branches were removed as soon as they appeared and the main stem was tied to the stake; this operation is repeated at various intervals during the growth of the plants. When the third cluster of flowers is formed, the plants are headed back. The plants are 3 feet apart each way.

The yield of varieties tested for five years as well as the yield obtained in 1928 are given in the following table:—

TOMATOES—RESULTS OF TEST OF VARIETIES

Varieties	Source	1928 plot			Average yield per acre for 5 years
		1st picking	Yield		
			lb.	oz.	lb.
Alacrity	C.E.F	Aug. 20	15	0	19,812
Danish Export	Wibott	" 21	17	0	19,812
Gulf State Market	Ferry	" 27	17	12	19,810
Sparks Earliana	Ewing	" 16	30	0	19,570
Avon Early	Vaughan	" 18	18	0	19,328
Rose	C.E.F	" 17	14	0	19,744
New 50-days	Buckbee	" 24	18	8	19,360
Earliana Selected	Moore	" 20	20	8	19,118
Chalks Jewel Early	Steele Briggs	" 24	12	0	18,392
Bonny Best	Stokes	" 21	13	8	18,150
Alacrity x Hipper	C.E.F	" 15	18	4	17,666
Globe	Livingston	" 30	16	12	17,660
John Baer	Steele Briggs	" 22	11	0	17,424
Alacrity x Earlibell	C.E.F	" 21	11	0	17,424
Self Pruning	Burpee	" 25	16	4	17,422
First of All	McKenzie	" 22	11	5	17,182
Mascot Early	Graham	" 24	17	12	16,940
Earliest	Steele Briggs	" 18	21	0	16,698
Scarlet Skin	Rennie	" 21	10	0	16,456
Red Head	Langdon	" 30	8	0	16,314

LIST OF PROJECTS UNDERTAKEN FOR THE HORTICULTURAL DIVISION

VEGETABLES

H 58—Beans—Distance of planting.
H 61—Beans—Test of varieties.
H 65—Beets—Different dates of sowing.
H 68—Beets—Test of varieties.
H 70—Brussels sprouts—Test of varieties.
H 74—Cabbage—Sowing in hotbeds vs. in the open.
H 77—Cabbage—Test of varieties.
H 79—Carrots—Different dates of sowing.
H 83—Carrots—Test of varieties.
H 88—Cauliflowers—Test of varieties.
H 94—Celery—Test of varieties.
H 101—Corn—Suckering experiment.
H 102—Corn—Test of varieties.
H 106—Cucumbers—Test of varieties.
H 107—Egg plant—Test of varieties.
H 110—Kohl Rabi—Test of varieties.
H 112—Leeks—Test of varieties.
H 116—Lettuce—Test of varieties.
H 122—Muskmelons—Test of varieties.
H 125—Watermelons—Test of varieties.
H 126—Okra—Test of varieties.
H 127—Onions—Fall vs. spring sowing.
H 137—Onions—Transplanting vs. sowing in the open.
H 138—Onions—Test of varieties.
H 140—Parsley—Test of varieties.
H 142—Parsnips—Different dates of sowing.
H 145—Parsnips—Test of varieties.

H 148—Peas—Different distances of planting.
H 153—Peas—Test of varieties.
H 157—Peppers—Test of varieties.
H 161—Potatoes—Planting at different dates for yield.
H 186—Potatoes—Test of varieties.
H 183—Potatoes—Sprouted vs. unsprouted tubers.
H 188—Pumpkins—Test of varieties.
H 192—Radishes—Test of varieties.
H 197—Salsify—Test of varieties.
H 199—Spinach—Test of varieties.
H 201—Squash—Test of varieties.
H 203—Swiss chard—Test of varieties.
H 207—Tomatoes—Different systems of pruning.
H 211—Tomatoes—Test of varieties.
H 214—Turnips—Test of varieties.
H 218—Seed—Spring vs. fall sowing.

CEREALS

The season of 1928 opened under fairly normal conditions. The ground was covered with a good layer of snow during the winter, which melted rather slowly in the spring, leaving no water on the surface of the soil. The first part of May was very favourable. The land was very moist and easy to put into shape. The first seedings were done on May 11 and continued until May 20. From May 20 until the end of the month, it rained every day, and as the temperature was rather cold for this time the vitality of the grains was weakened and the growth was slow. The first part of June was more favourable and the greater part of the crops were sown during this period in this district. The latter part of the month was wet, affecting the vitality of the grain. The growth was slow and tillering poor. July was warmer and more favourable, but comparatively damp. The rain was rather heavy in August and September; however, the crops were harvested under fairly favourable conditions.

The yield per acre for 1928 as well as the average for four years are given in the following tables. In each class of grain, the variety which is the most generally grown in the district was adopted as check variety and its yield was represented by 100, so as to compare all the varieties under test on the same basis.

SPRING WHEAT

Ten varieties of spring wheat were tested during the season. Sowing was done on May 11 and harvesting from August 23 to September 10.

SPRING WHEAT—RESULTS OF TEST OF VARIETIES

Four-year average

Name	Source of seed	Days to mature	Length of straw	Strength on scale of 10 points	Yield per acre 1928	Average yield per acre 1925-28	Relative yield in per cent of Huron O. 3, check	Average weight per measured bushel
		days	in.		lb.	lb.	%	lb.
Huron O. 3	Ste. Anne	107·0	41·3	9·0	2,592	2,902	100	62·1
Reward O. 928	Ottawa	100·4	37·1	9·85	1,785	2,194	95	63·1
Garnet O. 652	Ottawa	97·2	35·2	9·85	1,800	2,191	95	62·6
Pringle's Champlain 307	Macdonald College	109·8	43·2	9·35	2,508	2,366	103	61·4
Marquis O. 15	Ottawa	108·2	39·97	9·75	2,448	2,341	102	61·7
Huron CR 7	Cap Rouge	107·2	42·0	9·85	2,412	2,349	98	61·7
Red Fife, Man	Newpawa	113·3	41·9	9·0	2,172	2,186	93	60·2
Master O. 520	Ottawa	97·7	35·2	10·0	1,695	1,987	86	61·7
Preston	Ste. Anne	108·7	41·5	8·75	2,010	2,088	88	60·7
Early Red Fife O. 16	Ottawa	111·0	41·6	9·85	2,120	2,009	87	61·6

Garnet Ottawa 652 and Reward Ottawa 928 are early varieties; they mature 7 to 9 days earlier than Huron Ottawa 3, and from 10 to 12 days earlier than the other late varieties. Garnet wheat is 2 to 3 days earlier than Reward, but the yields are practically the same. As regards the appearance of the grain, quality of flour and weight per measured bushel Reward beats all other varieties. This new variety will probably be useful for districts where Huron and Marquis wheat do not ripen. Selections of Huron variety come next as regards maturity and give a good yield of grain per acre. One of the main advantages of this variety is its ability to withstand poor conditions of soil and temperature.

Pringle's Champlain and Marquis Ott. 15 ripen at the same time and give very good yields of grain. The three other varieties, i.e., Manitoba Red Fife, Early Red Fife Ott. 16 and Preston, have a longer period of growth, do not yield as much, and their straw is weaker and always more susceptible to rust than any of the other varieties mentioned.

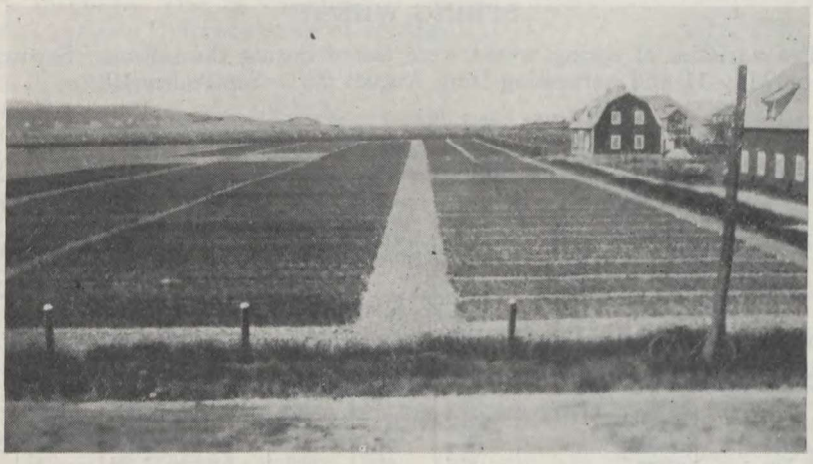
OATS

Eight varieties or selections of oats were tested this season. Sowing was done on May 14 and harvesting from August 22 to September 7.

OATS—RESULTS OF TEST OF VARIETIES

Four-year average

Name	Source of seed	Days to mature	Length of straw	Strength of straw on scale of 10 points	Yield per acre 1928	Average yield per acre 1925-28	Relative yield in per cent of Banner O. 49, check	Average weight per measured bushel
		days	in.		lb.	lb.	%	lb.
Banner O. 49	Ste. Anne	109·0	42·4	9·4	2,352	2,773	100	36·9
Banner MC 44	Macdonald College	108·0	42·7	9·5	2,290	2,882	104	37·0
Gold Rain	Ottawa	104·2	44·9	9·7	2,736	2,986	108	40·6
Victory	Ottawa	109·7	42·2	9·2	2,679	2,965	108	38·7
Banner OR 31	Cap Rouge	109·0	42·0	9·5	2,340	2,814	101	36·5
Longfellow O. 978	Ottawa	104·2	43·4	8·4	2,254	2,684	97	36·6
O.A.C. 144	Guelph	108·7	44·6	9·4	2,271	2,631	95	34·6
Alaska	Macdonald College	94·2	39·7	9·6	1,893	2,131	77	39·2



Cereal test plots.

It will be noticed that Alaska is an early variety, ripening fifteen days earlier than Banner Ott. 49. Its average yield for a 4-year period is 2,131 pounds, or 642 pounds less than the yield given by Banner oats. Alaska oats would be very profitable for districts where Banner variety is too late. It is also very suitable for sowing with barley, for a crop of mixed grain. The Gold Rain and Victory oats have always given heavy yields. However, the Gold Rain, on account of its yellow colour, and Victory, on account of the weakness of its straw, have never been in great demand in this district.

All selections of Banner oats are very similar in every detail; they ripen in the same time, the straw is of the same strength and of the same length, and there is only a difference of a few pounds in the yields.

The other varieties mentioned in the table, Longfellow Ott. 478 and O.A.C. 144, have never yielded as well as Banner oats here and have nothing special to recommend them.

BARLEY

Six varieties of six-rowed and four of two-rowed barley were tested this year. The seeding was done on May 28 and harvesting from August 16 to 30.

BARLEY—RESULTS OF TEST OF VARIETIES

Name	Source of seed	Days to mature	Length of straw	Strength on scale of 10 points	Yield per acre 1928	Average yield per acre 1925-1928	Relative yield in per cent of O.A.C. 21, check	Average weight per measured bushel, 1926-1928
		days	in.		lb.	lb.	%	lb.
		Six-rowed varieties						
O.A.C. 21	Guelph	90·2	35·9	9·2	2,788	2,726	100	48·2
Bearer Ott. 475	Ottawa	97·7	39·3	8·8	3,254	3,044	112	48·2
Chinese Ott. 60	Ottawa	90·4	36·2	9·3	2,817	2,663	98	49·1
Manchurian	Cap Rouge	92·7	38·1	9·0	2,693	2,516	92	50·1
Star	Macdonald College	94·2	28·4	9·7	3,029	2,775	102	49·5
Mensury	" "	92·4	37·7	9·0	2,574	2,339	86	50·1
		Two-rowed varieties						
Charlottetown, 80	Charlottetown	100·0	34·4	9·2	2,655	2,734	100	51·9
Hannchen	Ottawa	100·0	34·4	8·5	2,520	2,621	96·1	52·0
Duckbill 207	Macdonald College	101·9	39·3	9·4	2,549	2,515	92	52·2
Duckbill 57	Ottawa	101·0	37·3	9·6	2,387	2,391	88	51·4

Bearer, one of the recent introductions, deserves to be mentioned. It ripens 6 to 7 days after O.A.C. 21 but gives a higher yield. It is also very suitable for sowing in a mixture with Banner oats, to be harvested as mixed grain. Star barley has a short straw and a short head, but the head is well filled and it gives high yields of grain.

Among two-rowed varieties, Charlottetown No. 80 and Hannchen gave the highest yields. They also ripen at the same time. One of the main characteristics of the Charlottetown No. 80 is that its beards disappear as it ripens.

PEAS

Six varieties of peas, i.e., Chancellor, O.A.C. 21, Arthur, Gold Vine, Mackay and Prussian Blue, were sown in the spring. Unfortunately, this part of the field was lower than the rest and the rains during the latter part of May packed the ground to such an extent that the peas were unable to resume normal growth. The yields obtained are not given as they are not typical.

SELECTION OF PEAS, ARTHUR VARIETY

It is thought advisable to report again this year on the selection work conducted with this variety of peas, so as to obtain a single type representative of the old Arthur pea, which had become a mixture of various types of all sorts of colours and sizes.

A few pods from a typical plant were harvested in the fall of 1923 and sown in the spring of 1924, one row for each pod. This procedure was followed for three years, in order to enable us to make a good selection of each plant.

In 1927, one-quarter acre was sown and 780 pounds were harvested, corresponding to a yield of 52 bushels per acre. This seed was registered in the fall as Elite Stock seed; this spring 2 acres were sown and gave an average yield per acre of 42·5 bushels. It is hoped that these peas will again be Elite Stock seed this year, and that it will be possible to start propagating them.

One advantage of the Arthur pea, as compared with other varieties, is that it ripens at about the same time as Banner oats, and it is thus very suitable for sowing with the latter and harvesting as mixed grain. It also produces a great deal of straw which makes it very useful as a green fodder crop and it is very popular for home consumption on account of its white pea of average size.

BEANS

Four varieties of beans were sown on June 6, and harvested from September 20 to 24. The results are given in the following table:—

FIELD BEANS—RESULTS OF TEST OF VARIETIES

Four-year average

Name	Source seed	Days to mature	Yield per acre 1928	Average yield per acre 1925-1928	Relative yield in p.c. of check Navy O.711	Average weight per measured bushel 1926-28
		days	lb.	lb.	%	lb.
Navy O. 711	C.E.F.	110·0	900	1,588	100	64·2
Robust	Macdonal College	117·0	836	1,614	102	65·6
Large White Ott. 713	C.E.F.	116·0	610	1,389	87	63·4
Improved Yellow Eye	Macdonald College	114·5	640	1,313	83	62·3

Navy Ott. 711 is the earliest of the four varieties tested; it is a white bean, of medium size, very suitable for home consumption. It gives a fairly good yield. The Robust ripens about one week later; it is a white bean, very small but very productive. It is the best bean for soup. The other two varieties ripen at about the same time but they do not yield as much as the preceding ones. One is entirely white and very large; the other is white with a yellow eye and of medium size.

MIXED GRAIN CROPS

This project was undertaken last year with seven plots, sown to different mixtures; it was continued and its scope was increased during the season. The object of this experiment is to find the best grain mixture as well as the best proportion for the production of large yields, of a high nutritive value. Fourteen mixtures were tried this year in duplicate acre plots. There were four varieties of oats, four of barley and three of peas. This work will be continued for a few years before publishing the results obtained, so as to give reliable information.

PRELIMINARY TEST OF CEREALS (ROD-ROW PLOTS)

These preliminary tests with cereals are conducted on small plots including three or five furrows 16·5 feet long and 7 inches apart for each variety. The grain that is sown in each furrow is weighed and the quantity to be sown is

determined by the weight of 1,000 grains and the percentage of germination of each of the varieties. The object is to sow as much as possible in each furrow the same amount of grains which will germinate for each variety.

The yields obtained and the number of days to ripen for ten varieties of wheat, oats and barley, over a four-year period, 1925-28, are given in the following table:—

RESULTS OF PRELIMINARY TEST OF CEREALS

Wheat			Oats			Barley		
Varieties	Days to ripen	Yield per acre	Varieties	Days to ripen	Yield per acre	Varieties	Days to ripen	Yield per acre
		bush.			bush.			bush.
Early Russian	109·7	39·9	Banner Sask. 99	110·8	94·1	Hannchen	103·5	63·3
Chelsea Ott. 10	107·8	39·7	Leaders B.	107·0	91·1	Chinese Ott. 60	94·3	63·2
Whiteheads C. 123	111·2	39·6	Banner Vaugh	110·0	90·0	O.A.C. 21	94·3	62·8
Bishops Ott. 8	107·9	38·2	Victory Sv	110·3	89·8	Manchurian Ott. 50	97·3	62·2
Marquis Ott. 15	110·5	37·7	Lincoln	109·0	89·1	Star	96·8	61·6
Aurore	108·6	37·1	Danish Island	108·8	88·4	Gold	103·8	61·5
Huron C.R. 7	104·4	36·9	Banner V.B.C.	110·1	88·1	Bearer Ott. 475	106·8	60·7
Reward Ott. 928	106·8	35·0	Banner Dow	110·3	87·4	Manchurian C.R. 4	97·7	59·4
Huron Ott. 3	111·4	34·7	Gold Rain	106·4	86·7	Charlottetown 80	103·8	58·5
White Russian	113·4	34·4	Columbian Ott. 78	109·2	86·0	Duckbill 207	106·8	57·2

LIST OF PROJECTS UNDERTAKEN FOR THE CEREAL DIVISION

Ce 1—Common spring wheat—Test of varieties.
Ce 5—Oats—Test of varieties.
Ce 6—Barley—Test of varieties.
Ce 7—Peas—Test of varieties.
Ce 8—Beans—Test of varieties.
Ce 9—Flax—Test of varieties for seed.
Ce 13—Common spring wheat—Production of superior lines through selection of old varieties.
Ce 17—Oats—Production of superior lines through selection of old varieties.
Ce 19—Peas—Production of superior lines through selection of old varieties.
Ce 50—Production of Registered grains.
Ce 59—Test of pea and oat mixture for grain production.
Ce 60—Test of barley and pea mixture for grain production.
Ce 61—Test of barley, oat and wheat mixture for grain production.
Ce 76—Seed selection—Selected seed vs. non-selected seed.

FORAGE PLANTS

During the present growing season the temperature was not as favourable for forage plants as during preceding years. The heavy rains during early summer packed the soil so that the growth of corn and roots was very slow and the strong growth of weeds interfered with the growth of leguminous and grass seed. Mangels, requiring as they do a deep and loose soil, suffered the most from these conditions, and the yields were much below those of the preceding years.

CORN

Twenty-six varieties were tested during the season; three rows are sown for each variety and each variety is replicated four times. The seed is sown by hand, in hills, three feet apart each way.

The yields obtained in 1928 as well as the average yield for the number of years that these varieties were tested are given in the following table:—

Variety	Source	Height	Yield per acre 1928		Maturity at harvest	Average yield per acre		Number of years tested
			Green weight	Dry matter		Green weight	Dry matter	
		in.	tons lb.	tons lb.		tons lb.	tons lb.	
Compton's Early	Duke	75	11 1,640	1 1,920	Ears formed	13 1,475	2 441	6
Wisconsin No. 7	Duke	78	13 1,200	1 1,740	Ears forming	13 1,716	2 417	6
Yellow Dent	Wimple	76	15 626	2 235	Ears forming	13 1,241	2 897	6
Longfellow	Duke	78	16 1,427	2 386	Ears formed	13 1,523	2 637	6
Golden Glow	Duke	80	14 1,192	2 977	Ears forming	13 662	2 967	6
Leaming	Duke	80	13 207	2 33	Ears forming	12 1,681	2 239	6
Bailey	Duke	75	15 1,212	2 785	Ears formed	13 461	2 662	6
North Dakota	Steel Briggs	78	16 1,456	2 339	Ears forming	14 1,146	2 463	6
North Western Dent	North Dakota (McKenzie)	70	15 1,361	2 999	Late milk	12 1,923	2 101	6
90 days White Dent	Dakota Improved Seed	78	18 167	2 1,201	Ears formed	15 485	2 1,168	5
Hybrid	Wimple	75	17 1,481	2 1,155	Ears forming	17 963	2 1,491	5
Burr Leaming	Carter	82	16 14	2 482	Ears forming	16 1,799	2 148	5
North Western Dent	MacDonald College	72	13 360	1 1,460	Late milk	13 47	2 116	4
Longfellow	Johnson	76	11 1,339	1 140	Ears formed	13 593	2 224	4
Minnesota 13	Dakota Imp. Seed	76	11 464	1 240	Ears forming	13 658	2 606	4
Bailey	Boudy	78	12 1,380	1 1,960	Ears forming	12 1,549	2 382	4
Red Cob	Steele Briggs	80	10 1,903	1 1,259	In bloom	15 1,042	2 450	4
White Cap Yellow Dent	Steele Briggs	80	16 1,293	2 914	Ears forming	14 572	2 733	4
Pride Yellow Dent	Dakota Imp. Seed	65	11 1,567	1 1,764	Milky	11 1,814	1 1,815	4
Longfellow	Pop Long	72	17 558	2 575	Ears forming			1
Iroquois	MacDonald College	75	11 1,320	1 1,760	Milky			

The highest yield of dry matter per acre was given by the Wimple Hybrid variety, i.e. 2 tons and 1,491 pounds, followed by the 90-day White Dent variety, with 2 tons and 1,168 pounds. The Hybrid variety also gave the highest yield of green weight. The rather low yields given by all varieties of corn, in green and dry matter, are due to the fact that when ensiling time came none of the varieties mentioned in this table had ears sufficiently ripe to increase the yield of green matter and especially the yield of dry matter.

Five varieties—Gehu, Quebec 28 (MacDonald College), Quebec 28 (Dr. Todd), North Western Dent (Brandon), Amber Flint (Wimple)—were left on the field until the first frosts to see if a few ripe ears could be harvested. This year, as in previous years, none of them ripened.

RUSSIAN SUNFLOWERS

Six varieties of sunflowers were tested during the year; there were five rows 60 feet long and 3 feet apart for each variety.

They were sown on June 15 and harvested when about three-quarters of the variety were in flower. Two later varieties did not reach this stage and had to be cut before the frosts.

The Mammoth Russian variety, from Ewing Co., gave the highest yield of dry matter. The same variety, from Kenneth McDonald, while giving 3 tons and 1,359 pounds less green weight, had only 65 pounds less of dry matter. The same selection, from Rosthern, Sask., is much earlier but is not nearly as tall and does not yield as much.

SUNFLOWERS—TEST OF VARIETIES

Varieties	Source	Height	Martuity at harvest	Date harvested	Yield per acre 1928		Average per acre		Number of years tested
					Green weight	Dry matter	Green weight	Dry matter	
		in.			tons lb.	tons lb.	tons lb.	tons lb.	
Mammoth Russian	Kenneth McDonald.	90	50% in bloom.	Sept. 24	18 849	2 1,443	18 1,509	3 1,043	6
Manchurian	McKenzie	80	75% in bloom.	" 8	14 1,815	1 1,330	16 125	2 141	5
Mammoth Russian	Ewing	82	75% in bloom.	" 8	18 203	2 131	22 868	3 1,108	4
Mammoth Russian	Dakota Imp. Seed.	50	75% in bloom.	Aug. 28	11 525	1 298	12 824	1 733	3
Ottawa 76	Ottawa	72	75% in bloom.	Sept. 8	14 1,815	1 1,634	13 451	2 524	3

MANGELS

Thirty-five varieties or selections were tested this season in rows 30 inches apart and the roots thinned at 8 inches. They were sown on May 14 and pulled from October 15 to 21.

MANGELS—TEST OF VARIETIES

Varieties	Source	Yield per acre, 1928		Average yield per acre		Number of years tested
		Green weight	Dry matter	Green weight	Dry matter	
		tons lb.	tons lb.	tons lb.	tons lb.	
Yellow Intermediate	Ottawa	16 1,477	2 811	19 1,527	2 1,185	7
Danish Sludstrup	D. & F.	17 953	1 1,509	19 1,839	2 1,238	7
Danish Half Sugar	Ste. Anne	15 130	1 1,878	19 588	2 298	6
Perfection Mammoth Long Red	Rennie	15 1,250	2 3	17 996	2 1,077	6
Stryno Barres	Hartman	19 1,202	2 10	20 1,412	2 901	5
F. Jerritslen Barres	"	17 1,373	1 1,668	19 1,751	2 1,271	5
Rosted Barres	"	18 1,669	2 562	22 201	2 962	5
Sludstrup Barres	"	19 1,982	2 950	22 964	2 1,932	5
White Red Top Half Sugar	"	14 1,278	1 1,566	18 1,175	2 285	5
White Green Top Half Sugar	"	15 1,975	1 1,696	19 805	2 712	5
Svalof Alpha Red	G. Swedish	13 600	1 1,397	18 1,356	2 699	5
Vauriac Yellow	Vilmorin	18 1,397	2 162	19 1,987	2 842	5
Echendorffer Yellow	Hartman	18 1,397	2 117	22 829	2 178	5
Echendorffer Red	"	16 100	1 1,749	21 174	2 116	5
Echendorffer Yellow	G. Swedish	17 1,926	1 1,632	21 471	2 53	5
Echendorffer Red	"	16 180	1 1,257	21 706	2 164	5
Improved Tankard Cream	Rennie	13 1,540	1 1,087	20 963	2 119	5
Ideal	"	16 1,555	1 1,802	21 1,313	2 677	5
Golden Tankard	"	12 1,304	1 697	16 1,930	1 1,444	5
Golden Tankard	D. & F.	13 1,014	1 1,161	18 617	2 124	5
Elevatham Mammoth	Hartman	13 1,907	1 1,204	18 1,904	2 360	5
Long Red Mammoth	D. & F.	17 295	1 1,433	19 1,596	2 521	5
Long Red Mammoth	Sutton	17 540	2 100	21 1,590	2 857	5
Long Yellow	Dupuy & Fer	14 242	1 1,717	15 214	2 131	5
Barres Half Long	G. Swedish	21 141	2 732	21 1,411	2 853	5
Yellow Globe	D. & F.	15 586	1 1,680	22 458	1 1,945	5
Yellow Globe	Rennie	19 1,156	1 1,011	21 1,347	1 1,771	5
Yellow Globe	Sutton	18 1,900	1 1,241	25 855	2 275	5
Giant Sugar	Rennie	13 993	1 1,061	18 1,294	2 358	5
Barres Oval	G. Swedish	19 1,276	2 662	21 852	2 909	5
Giant White Sugar	R. Moore	19 861	2 411	22 229	2 1,248	4
Slusdtrup	Penticton	16 519	2 133	19 984	2 1,004	3
Eclipse	McKenzie	18 506	2 315	19 971	2 772	3
Danish Sludstrup	James	16 1,849	2 864	.. ..	.. ..	1
White Half Sugar	D. & F.	13 1,732	1 1,569	.. ..	.. ..	1

As seen in the above table, mangels gave very low yields this year, probably on account of the heavy rains that fell during the last part of May and in June. The ground was packed to a considerable depth and the roots had much difficulty in growing.

The average yield given by eight varieties of the intermediate type for five years is 20 tons and 456 pounds of green weight, and 2 tons 950 pounds of dry matter per acre.

Eight varieties of the tankard type under test for five years gave an average yield of 20 tons 875 pounds green weight, and 2 tons 109 pounds dry matter per acre. Four varieties of the long type gave 18 tons 1,826 pounds green weight, and 2 tons 467 pounds of dry matter per acre. Four varieties of the globe type gave an average yield of 21 tons 1,986 pounds green weight, and 2 tons 87 pounds of dry matter.

The difference between the yields given by each of the different types is very small; but the long type varieties are much more difficult to pull.

SUGAR BEETS

Seven varieties of sugar beets were tested this year. They were sown in the same manner as the mangels and at the same date. At pulling time, twelve roots of each variety, representative of the type of the variety were forwarded to the Chemical Laboratory at Ottawa, for analysis of the sugar content. The yields per acre as well as the percentages of sugar are given in the following tables:—

SUGAR BEETS—TEST OF VARIETIES

Varieties	Source	Yield per acre	
		tons	lb.
Dieppe	Dominion Sugar Co	8	1,972
Frederiksen	"	8	1,972
Bielotserkov 10 E	Amtorg Trading Corporation	8	1,460
Uladovka 4 E	" "	9	0,065
Vierchniatchka 3 N	" "	8	0,344
Buszczynski	" "	7	1,644
Kalnik 8 Z	" "	7	0,434

SUGAR BEETS—CHEMICAL ANALYSIS

Varieties	Sugar in juice	Coefficient of purity	Average weight per root	
	p.c.	p.c.	lb.	oz.
Dieppe	21·44	87·08	1	2
Frederiksen	20·53	84·98	1	3
Bielotserkov 10 E	20·71	85·94	1	..
Uladovka 4 E	20·92	88·55	1	3
Buszczynski	21·60	88·14	..	12
Kalnik 8 Z	21·02	77·71	..	14

AVERAGE YIELD OF SUGAR BEETS—1922-1928

Year	Number of varieities	Average yield		Average weight per root		Average sugar in juice	Coefficient of purity
		tons	lb.	lb.	oz.	p.c.	p.c.
1928	6	8	924	1	..	21·04	85·40
1297	9	21	566	1	6	20·16	90·82
1926	8	11	179	1	7	17·74	83·37
1925	7	13	94	1	14	18·52	82·82
1924	8	9	748	1	7	19·92	84·79
1922	6	8	427	1	1	17·69	87·38
6-year average	6 to 9	11	1,823	1·37		19·18	85·68

As in the case of mangels, the yield of sugar beets is much below that of last year. However, the coefficient of purity and the percentage of sugar compare very favourably with those of the preceding years, and it may be said that from a commercial point of view these yields would be very satisfactory.

SWEDE TURNIPS

Thirty-four varieties or selections of swede turnips were tested during the season. They were sown in rows thirty inches apart and the plants were thinned 12 inches apart; each variety was replicated five times.

The yield for this year as well as the average yield for the number of years tested are given in the following table. The average yield of dry matter for all the varieties mentioned in the table is three tons.

SWEDE TURNIPS—TEST OF VARIETIES

Varieties	Source	Yield per acre, 1928		Average yield per acre		Number of years tested	Remarks
		Green weight	Dry matter	Green weight	Dry matter		
		tons lb.	tons lb.	tons lb.	tons lb.		
Ditmars	McNutt	18 1,560	1 1,479	23 504	2 617	6	Good shape, green top.
Olsgaard Bangholm	Hartman	22 242	2 1,313	20 1,504	2 1,216	6	Oblong, red top.
Bangholm	D. & F.	22 448	2 574	20 1,524	2 371	6	Red, top slightly elongated, good.
Kangaroo	"	20 41	2 629	21 1,063	2 1,052	6	Bronze green top, elongated.
Sutton's Purple Top Champion	"	17 834	2 121	19 1,834	2 700	6	Elongated, red bronze top.
Elephant	"	19 1,309	2 450	20 1,639	2 614	6	Elongated, red elongated top, rooty.
Good Luck	Ste. Anne	20 430	2 775	21 1,617	2 1,195	6	Slighty elongated, red top.
Perfection	Dupuy & Ferguson	19 385	2 61	21 303	2 374	5	Good shape, red bronze top.
Nec plus ultra	"	22 1,949	2 1,192	22 1,734	2 834	5	Good, bronze top.
Kangaroo Bronze Green Top	Rennie	19 1,331	2 523	20 1,058	2 442	5	Good, bronze green top.
Improved Jumbo	"	21 85	2 642	20 1,710	2 685	5	Rooty, red elongated top.
Canadian Gem	"	23 155	2 1,229	22 270	2 952	5	Oblong, good shape, red top
Magnum Bonum	"	22 743	2 702	23 969	2 864	5	Good shape, red top.
Prize Purple Top	"	21 1,850	2 771	22 762	2 758	5	Purple top.
Invicta	"	22 191	2 565	24 1,714	2 827	5	Purple top.
Best of All	"	18 498	1 1,883	20 888	2 196	5	Red top, slightly elongated.
Bangholm	Nappan	15 1,424	2 619	18 888	2 692	5	Oblong, purple top.
Bangholm	Gen. Swedish	21 707	2 1,663	18 1,278	2 1,031	5	Red top, good.
Shepherd's Yellow Globe	Hartman	20 1,912	2 992	22 200	2 705	5	Green purple top.
Shirwings	K. McDonald	15 102	1 1,973	17 63	1 1,944	5	Oblong, red top.
Improved Yellow	General Swedish	17 1,241	2 398	22 1,390	2 1,537	5	Good shape, green top.
Bangholm	Charlottetown	13 921	1 1,500	19 671	2 359	5	Good shape, red top.
Bangholm 8312	MacDonald College	17 1,491	1 1,829	21 1,656	2 649	4	Good shape, red top.
Magnum Bonum	Sutton	16 238	1 1,130	21 1,417	2 376	4	Good shape, red top.
Lord Derby Improved	"	17 177	1 1,380	24 500	2 531	4	Good shape, green top.
Elephant	"	14 794	1 871	19 1,450	2 248	4	Elongated, red top slightly long.
Good Luck	Steele Briggs	16 162	1 1,210	19 1,667	2 290	4	Elongated, red top slightly long.
Hall's Westbury	Ewing	14 1,525	1 955	21 919	2 540	4	Good shape, red top.
Bangholm	Kentville	15 1,018	2 166	18 781	2 739	3	Green purple top.
Perfect Model	C.E.F.	22 1,751	2 964	.....	.....	1	Good shape, red top.
Purple Top	"	18 1,970	2 404	.....	.....	1	Purple top.
Bangholm	Hartman	15 1,926	2 403	.....	.....	1	Red elongated top.
Bangholm Pyberg	Trifolium	19 386	2 1,021	.....	.....	1	Good, green top.
Bangholm Klonk	"	17 84	2 213	.....	.....	1	Red top.
*Yellow Tankard	Dupuy & Ferguson	15 163	.....	22 321	2 401	4	Fairly long shape, green.
*Fynch Bartfelder	"	16 1,938	.....	20 413	1 1,700	4	Very long shape, green.
*Dales' Hybrid	"	15 163	.....	18 933	1 1,575	3	Very good shape, green.

*Fall turnips. The three last varieties of turnips were not taken in consideration.

It will be seen that five varieties yielded over 5,000 pounds of dry matter per acre. They are as follows, by order of yield: Improved Yellow, from General Swedish, 5,537 pounds; Bangholm of Olsgaard, from Hartman, 5,216 pounds; Good Luck, a selection from Ste. Anne's farm, 5,195 pounds; Kangaroo, from Dupuy & Ferguson, 5,052 pounds and Bangholm, form General Swedish, 5,031 pounds.

The average yield of green matter for all the varieties is 21 tons 275 pounds and the average yield of dry matter 2 tons 666 pounds.

CARROTS

Eleven varieties or selections were tested during the year. As in the case of beets and swede turnips, the rows were 28 inches apart and the plants were thinned to 4 inches.

The results obtained are given in the following table:—

CARROTS—TEST OF VARIETIES

Varieties	Source	Yield per acre 1928 green weight		Average yield per acre green weight		Number of years tested
		tons	lb.	tons	lb.	
White Belgian	Dupuy & Ferguson	17	381	14	1,271	6
Danish Champion	Ottawa	16	1,683	12	1,586	6
Large White Vosges	Dupuy & Ferguson	15	878	12	651	5
Mammoth Short White	Rennie	19	840	16	715	5
White Belgian (9008)	Trifolium	15	1,681	15	46	5
Large White Belgian	Rennie	17	1,123	14	1,097	5
White Belgian	Hartman	17	1,867	14	345	5
Champion	Hartman	14	82	12	83	5
Champion	General Swedish	16	1,033	14	663	4
White Intermediate	Summerland	19	490	17	1,643	3
James	Ottawa	13	203			1

LEGUMES AND GRASSES

On account of the lack of suitable land, the tests with legumes and grasses had to be reduced again this year. On the section of the land that should have been sown to legumes and grasses in the spring, mangels were grown so as to control the weeds and prepare this field for next year.

Seventeen hay mixtures, three different selections of timothy, and two varieties of alfalfa were sown in the spring on duplicate $\frac{1}{100}$-acre plots. All these plots had grown fairly well this fall and appeared to be in good condition for the winter.

MIXTURES FOR HAY AND PASTURE

Eleven different mixtures containing alfalfa, red clover, orchard grass and fescue were sown in 1927 and harvested this season.

The following mixture gave the highest yield in dry matter per acre this year, i.e. 3 tons 891 pounds: timothy, fescue, red clover, white clover. Another mixture including timothy, orchard grass, red clover, alsike and white clover gave 3 tons 91 pounds.

The other mixtures gave yields varying between 2 tons 1,278 pounds and 2 tons 1,929 pounds.

TESTS OF TIMOTHY, ALFALFA, RED CLOVER AND ALSIKE CLOVER

Each year since 1924, a few varieties or selections of each of the above-mentioned plants were tested. Unfortunately the land was not entirely free from weeds and the results obtained prior to this year were not strictly representative of what each of these plants might give on a well-prepared soil.

Very uniform results were obtained this year from the 1927 sowings and it is hoped that a few useful practical deductions might be made in the course of a year or two.

TEST OF ANNUAL GRASSES AS HAY AND PASTURE CROPS

Eleven different grasses were tested in duplicate 1/100 acre plots. The following pasture crops gave a fair yield: Sudan grass, orchard grass, meadow fescue, tall oat grass and brome. Kentucky blue grass and Western Ray Grass gave practically no yield.

TEST OF GRAIN MIXTURES FOR HAY AND GREEN FODDER

As the use of green fodder is increasing in the district, and as it is desirable that it should still further increase, several plots of mixed grains were sown last year. There were this year 20 duplicate 1/100 acre plots, including 20 different mixtures, to determine the mixture giving the highest yield of hay and the richest hay for feeding. The yield of green weight this year was 12 tons 1,175 pounds. The highest yield of dry matter was 2 tons 1,901 pounds, and the lowest 2 tons 496 pounds.

LIST OF PROJECTS UNDERTAKEN FOR THE FORAGE CROP DIVISION

Ag 16—Beets—Test of varieties for yield and purity.
Ag 17—Beets—Production of pure lines.
Ag 19—Beets—Small vs. large seeds.
Ag 20—Beets—Early vs. late seeding for forage.
Ag 23—Beets—Seed production as commercial proposition.
Ag 24—Beets—Small vs. large roots for seed production.
Ag 25—Beets—Best method of seeding for seed production.
Ag 66—Sugar beets—Test of varieties for yield and purity.
Ag 46—Turnips—Test of varieties for yield and purity.
Ag 51—Swede turnips—Test of varieties for yield and purity.
Ag 52—Swede turnips—Production of pure lines.
Ag 53—Swede turnips—Early vs. late seeding.
Ag 58—Swede turnips—Seed production as commercial proposition.
Ag 59—Swede turnips—Best method of seeding for seed production.
Ag 60—Swede turnips—Thinning at different distances.
Ag 36—Carrots—Test of varieties for yield and purity.
Ag 1—Corn—Test of varieties for ensiling.
Ag 76—Russian sunflowers—Test of varieties for yield and purity.

LEGUMES AND GRASSES

Ag 126—Test of varieties for hardiness, yield and suitability.
Ag 146—Red clover—Test of varieties for yield and general suitability.
Ag 161—Sweet clover—Test of varieties.
Ag 178—Alsike clover—Test of varieties.
Ag 201—Timothy—Test of varieties.
Ag 231—White Dutch clover—Test of varieties for suitability and yield.
Ag 255—Test of different grasses.
Ag 264—Mixtures of clovers and grasses, alone and in combination, for hay and pasture.
Ag 248—Test of annual grasses for hay. Test of varieties for yield and suitability.
Ag 249—Test of mixtures for yield of hay.
Ag 251—Millets—Test of varieties.
Ag 246—Test of seed mixtures for green fodder hay.

POULTRY

Several experiments are conducted to ascertain the best methods of rearing and feeding in order to reduce the cost of production of chickens, pullets and eggs. The results of several experiments are given here.

On December 31, 1928, the poultry flock included 90 hens, 120 pullets, 10 cockerels and 16 cocks. There were also 200 hens in the laying contest. During the spring, 1,385 eggs were incubated, giving 815 chicks, 753 of which were raised.

The year was on the whole very satisfactory for poultry, and the demand for hatching eggs, day-old chicks, pullets and cockerels considerably exceeded the supply available at this Station. This shows that the extension work in poultry breeding is bearing fruit and splendid results should come from this development.

IMPROVEMENT OF POULTRY IN THE DISTRICT

In addition to special poultry field days held on the Station and on the Illustration Stations in the district and to special exhibits shown at fairs, 25 settings of hatching eggs, 150 pullets and 15 cocks from selected strains of layers were sold by the Station during the year and a large number of such requests were referred to the best poultry breeders of the district.

INCREASING PRODUCTION BY PEDIGREE BREEDING

All the hens kept on this Station are trap-nested and the production of each bird recorded. When the hatching season arrives, the best layers are mated with males of known parentage. This is what is known as systematic selection, based on a knowledge of facts. The annual production of the 15 best layers each year since 1923 is given in the following table and the attention of the reader is called to the gradual and regular increase obtained since the beginning of this experiment. It will be noted that production has doubled in a six-year period, being increased from 123·6 eggs per hen in 1923 to 246·2 in 1928.

PRODUCTION OF FIFTEEN BEST LAYERS

Year	Number of birds	Total eggs laid	Average production per bird
1923	15	1,854	123·6
1924	15	2,297	153·1
1925	15	3,036	202·4
1926	15	3,374	224·9
1927	15	3,333	222·2
1928	15	3,693	246·2

COST OF EGG PRODUCTION

The object of this experiment is to determine the cost of production of eggs during different months and for various periods of the year. Two pens, of ten Barred Plymouth Rock pullets each, were used in this experiment. They received a regular grain mixture prepared on the farm and a ration of dry mash composed of equal parts of bran, oatmeal, cornmeal and 15 to 18 per cent of beef scrap. Grit, shell and charcoal were also given in hoppers and mangels or sprouted oats as green feed were given once a day.

Month	Number of birds	Cost of feed	Eggs produced	Cost per dozen	Value	Profit over the cost of feed
		$ cts.		cts.	$ cts.	$ cts.
		Per period				
Oct. 15 to Feb. 15	20	14 09	1,034	17·7	42 25	28 17
Feb. 15 to June 15	20	17 72	1,558	14·2	46 19	28 47
June 15 to Oct. 15	20	18 78	858	26·9	28 57	9 79
		Per month				
November	20	3 28	167	23·4	5 60	2 32
December	20	3 77	210	21·5	9 62	5 85
January	20	3 70	307	14·5	15 36	11 66
February	20	3 34	350	11·4	11 68	8 34
March	20	4 42	298	18·0	9 93	5 51
April	20	3 92	462	10·2	14 50	10 58
May	20	4 68	436	12·9	12 70	8 02
June	20	4 70	362	15·6	9 06	4 36
July	20	4 56	256	21·4	7 45	2 89
August	20	4 94	211	28·0	6 69	1 75
September	20	4 64	224	24·9	7 48	2 84
October	20	4 64	167	33·4	6 95	2 31
Total for the year	20	50 59	3,450	19·6	117 02	66 43

The above tables show that these twenty pullets laid 3,450 eggs during the year at a total cost of $50.49, or 19·6 cents per dozen. This average cost of 19·6 cents was made possible by the high average of 172 eggs per pullet, and especially by the high production from November to May inclusive. It should also be noted that the average profit of $3.32 per pullet was due to this high winter production, during which the average value per dozen was 44 cents while the average value was 34·6 cents during the summer; that is practically 10 cents per dozen less.

It should be mentioned also that according to our experience, in order to obtain a good production of eggs during the winter the pullets should be about mature and in good flesh on the 1st of November. This requires that pullets should be hatched not later than May and that they receive a well-balanced ration during the period of growth, so as to have the necessary vigour to withstand the varying temperature of the winter and to assimilate their food profitably.

EGGS REQUIRED TO PAY FOR THE COST OF FEED

According to the experiment undertaken with twenty hens to ascertain the cost of eggs during the year, the feed cost was $2.53 per hen. Assuming that production is good during winter months and that the average value of eggs for the whole year is 40 cents per dozen, seventy-five eggs would be required to pay for the cost of feed consumed per hen for one year, when the feed is valued at the market price. The average number of eggs required in these experiments over a four-year period has been seventy.

COST PER BREED

For the purpose of this experiment, the pen of hens classed first at the end of the year for each of the breeds entered in the contest is used. All the hens receive the same care and the same treatment. The feed consumed is weighed

accurately and the value of the eggs laid is figured at an average price for the winter and summer periods which include, respectively, November to April and May to October.

Breed	Number of birds	Cost of feed	Eggs produced	Value	Profit over the cost of feed	Profit per bird
		$ cts.		$ cts.	$ cts.	$ cts.
Barred Plymouth Rocks	10	24 06	2,062	71 21	47 15	4 71
White Leghorns	10	22 38	1,972	66 28	43 90	4 39
White Wyandotte	10	22 52	1,850	61 81	39 29	3 93
Rhode Island Red	10	21 38	1,648	56 44	35 06	3 50

It is seen by the above table that the Barred Plymouth Rock breed comes first as regards the quantity of eggs laid and the net profit. It is followed by the White Leghorn, White Wyandotte and Rhode Island Red with 1,648 eggs and $3.50 profit over the cost of feed, labour not included.

In order to supply as much information as possible on the value of the breeds of hens for this section of the province, the production of the best pen of ten hens, over a five-year period, is given in the following tables:—

BARRED PLYMOUTH ROCKS

Year	Number of birds	Eggs produced	Value of eggs	Cost of feed	Profit over the cost of feed	Average profit per bird
			$ cts.	$ cts.	$ cts.	$ cts.
1924	10	1,896	66 77	21 64	45 13	4 51
1925	10	2,050	72 24	29 00	43 24	4 32
1926	10	2,019	80 76	27 95	52 81	5 28
1927	10	1,955	78 20	25 74	52 46	5 24
1928	10	2,062	71 21	24 06	47 15	4 71
5-year average	10	2,104	73 83	25 67	48 15	4 81

RHODE ISLAND REDS

Year	Number of birds	Eggs produced	Value of eggs	Cost of feed	Profit over the cost of feed	Average profit per bird
			$ cts.	$ cts.	$ cts.	$ cts.
1924	10	1,752	62 49	20 65	41 84	4 18
1925	10	2,032	76 14	29 55	46 59	4 67
1926	10	1,822	72 88	24 98	47 90	4 79
1927	10	1,417	56 68	25 11	31 57	3 16
1928	10	1,648	56 44	21 38	35 06	3 50
5-year average	10	1,734	64 92	24 33	40 59	4 06

WHITE LEGHORNS

Year	Number of birds	Eggs produced	Value of eggs	Cost of feed	Profit over the cost of feed	Average profit per bird
			$ cts.	$ cts.	$ cts.	$ cts.
1924	10	2,002	61 23	20 34	40 89	4 09
1925	10	1,764	64 71	25 39	39 32	3 93
1926	10	1,666	66 64	22 09	44 55	4 45
1927	10	1,481	59 24	21 65	37 59	3 76
1928	10	1,972	66 28	22 38	43 90	4 39
5-year average	10	1,775	63 62	22 37	41 25	4 12

QUEBEC EAST EGG-LAYING CONTEST

The sixth laying contest conducted at this Station showed the effect of the selection work done during the first years. This contest was started with twenty pens of ten pullets each of high quality stock, thus giving much more satisfactory results than the previous years. Three pens gave over 2,000 eggs for ten hens and the average production for the twenty pens was 171·7 eggs 171·1 points per hen.

The best hen of the contest, belonging to the Experimental Station of Ste. Anne de la Pocatière, laid 271 eggs and scored 279·4 points from November 1 to October 22. Thirty-five hens were registered, an increase of twenty over the previous year, and twenty others laid over 200 eggs but could not be registered owing to the fact that their eggs did not have the required weight; that is 24 ounces per dozen.

The egg production from the beginning of the contest is given in the following table:—

EGG PRODUCTION SINCE BEGINNING OF THE CONTEST

Years	Number of birds	Eggs laid	Average production per bird
1922-23	120	13,506	112·0
1923-24	170	23,473	138·0
1924-25	200	30,927	154·6
1925-26	200	28,998	144·9
1926-27	190	27,130	142·7
1927-28	200	34,337	171·7

CORN VS. BARLEY FOR LAYERS

The object of this experiment is to determine if barley is a satisfactory substitute for corn in the ration for layers. Two equal groups of pullets were cared for, housed and fed in the same manner, with one exception: one group received crushed corn in the scratch grain mixture, and corn meal in the mash, while the other group received barley and barley meal. This experiment is conducted from November to May and the results for four years are given in the following table:—

CORN VS BARLEY FOR LAYERS

—		Corn-fed group	Barley-fed group
Number of birds in group	No.	10	10
Total cost of feed	$	6 38	5 55
Number of eggs laid	No.	388	339
Value of eggs laid	$	14 32	12 55
Cost per dozen	$	0 214	0 197
Profit over cost of feed	$	7 95	7 00

The above table shows that the corn-fed group laid 49 eggs more and gave a net profit of 95 cents more for a six-month period. This experiment shows that corn, while appreciably more profitable, may be replaced by barley, especially on farms where corn is scarce and where barley may be easily grown.

SKIM-MILK VS BEEF SCRAP VS. MEAT

The object of this experiment is to determine the value of these three feeds as sources of animal protein.

Three lots of twelve pullets were housed, cared for and fed in the same manner, with one exception: one lot received all the skim-milk that it could consume and a mash containing no beef scrap; the second lot received beef scrap in the mash; a third lot received raw meat hung on the wall. This experiment was conducted from November to April. Skim-milk was valued at 4 cents per gallon; beef scrap at $4.75 per 100 pounds; horse meat at 3 cents per pound. Eggs sold for 45 cents per dozen during the period.

The results are given in the following table:—

FIVE-YEAR AVERAGE PRODUCTION

—		Lot fed skim-milk	Lot fed horse meat	Lot fed beefscrap
Number of birds in lot	No.	12	12	12
Number of eggs laid	No.	811	744	731
Total cost of feed	$	14 23	13 57	13 60
Value of eggs	$	32 00	29 86	28 85
Cost per dozen	$	0 212	0 219	0 225
Profit over cost of feed	$	18 53	17 01	15 41

It is seen in the above table that animal feed may be supplied with profit in three different forms. This experiment, conducted for five years, shows that the pullets receiving skim-milk come first with an average production of 811 eggs at an average cost of 21·2 cents per dozen for the period from November to March inclusive. The lot fed raw animal flesh (horse meat) comes next with an average production of 744 eggs at a cost of 21·9 cents per dozen; the lot fed beef scrap comes last with 731 eggs at a cost of 22·5 cents per dozen and an average net profit of $15.41 or $1.29 per hen for a six-month period.

ROOTS VS. CLOVER VS. SPROUTED OATS VS. EPSOM SALTS

An experiment was conducted at this Station to determine the most profitable green feed for hens and ascertain whether Epsom salts can be used successfully as a substitute for green feed. Four lots of 12 pullets were housed, cared for and fed alike, with the following exceptions: one lot received roots, one lot received clover, one lot received sprouted oats and the fourth lot received Epsom salts (1½ ounce for twelve birds) once a day, mixed in the drinking water or in the mash. Eggs sold at an average price of 45 cents per dozen during the period of the experiment.

COMPARISON OF GREEN FEED (4-YEAR AVERAGE)

—		Lot fed roots (beets)	Lot fed clover	Lot fed Epsom salts *	Lot fed sprouted oats
Number of birds in lot	No.	12	12	12	12
Number of eggs laid	No.	902	868	833	801
Cost of green feed	$	0 87	0 30	0 62	1 32
Total cost of feed	$	13 61	13 16	13 49	13 78
Value of eggs	$	33 82	32 55	31 25	30 03
Cost per dozen	cts.	15	15·2	16·2	17·2
Profit over cost of feed	$	20 21	19 39	17 74	16 25

* 2-year average only.

It is seen that after a four-year test with the various green feeds mentioned in the above table, the lot receiving roots (beets) comes first as regards the number of eggs laid, cost per dozen and total profit. This lot, during a six-month period and for four years, produced eggs at a feed cost of 15 cents per dozen with a profit of $20.21. It is closely followed by the clover lot; the lot fed Epsom salts comes third and the lot fed sprouted oats last.

FEEDING AND FINISHING ROASTERS

In order to ascertain the most satisfactory method of fattening and finishing roasters, thirty-six cockerels of the Barred Plymouth Rock breed were divided into six lots of six each. Five lots were placed in fattening crates and the other was left free in a fattening pen.

Skim-milk was used to prepare the mash for each lot at the rate of 1½ pound of milk per pound of grain, except in the case of lot No. 3 where milk was replaced by beefscrap. In addition to the feed mentioned all birds received charcoal and oyster shell.

Lot No. 1.—Barley meal, 2 parts; oatmeal, 2 parts; bran, 1 part mixed with milk at the rate of 1½ pound of milk for 1 pound of the mixture.

Lot No. 2.—Barley meal, 1 part; corn meal, 1 part; oatmeal, 2 parts; bran, 1 part, mixed with milk.

Lot No. 3.—Corn meal, 2 parts; oatmeal, 2 parts; bran, 1 part; beefscrap, 2 parts.

Lot No. 4.—Corn meal, 2 parts; oatmeal, 2 parts; bran, 1 part, mixed with milk.

Lot No. 5.—Corn meal, 2 parts; oatmeal, 2 parts; bran, 1 part; cooked potatoes, 1 part, with milk.

Lot No. 6.—Corn meal, 2 parts; oatmeal, 2 parts; bran, 1 part; mixed with milk.

The last lot was left free in a fattening pen while the others were confined in fattening crates, to ascertain the effect of confinement.

FEEDING AND FINISHING ROASTERS

Group No.	Weight per group at beginning	Weight at the end	Gain in weight	Feed consumed		Cost of feed	Initial value of group	Final value of group	Profit per group	Profit per bird
				Mash	Milk					
	lb.	lb.	lb.	lb.	lb.	$ cts.	$ cts.	$ cts.	$ cts.	cts.
1	28·2	33·7	5·5	31	46	0 98	7 05	10 11	3 06	51
2	25·2	33·2	8·0	43	44	1 25	6 30	9 96	3 66	61
3	26·0	28·8	2·8	28	8	1 16	6 40	8 64	2 24	37
4	25·0	32·2	7·2	34	46	1 05	6 25	9 66	3 41	57
5	26·5	36·0	9·5	28	42	0 98	6 62	10 80	4 18	70
6	24·7	29·7	5·0	31	45	0 97	6 17	8 92	2 75	46

It is shown by the above table that lot No. 5, which received cooked potatoes in addition to the meal mixture, made the best gains and gave the largest profit. This lot is followed by lot No. 2, which received barley meal in addition to the other grains. Lot No. 3, which received beefscrap in the place of skim-milk, did not give satisfactory results; neither did lot No. 6, which received the same feed as lot No. 4, but which was left free in a pen instead of being confined in a fattening crate. These results practically confirm the results shown by the same experiment last year.

LIST OF PROJECTS UNDERTAKEN FOR THE POULTRY DIVISION

P 1—Best type or make of incubators.
P 3—Best date for incubation.
P 15—Incubation costs.
P 22—Brooding costs.
P 28—Rate of growth in rearing.
P 29—Separation of sexes in raising.
P 43—Costs and gains in fattening roasters.
P 47—Milk substitutes for fattening.
P 48—Best date for marketing surplus stock.
P 58—Best hatching date for egg production.
P 60—Pullets vs. hens for egg production.
P 62—Costs of egg production.
P 64—Egg-laying contest.
P 74—Temperature of houses of different depths.
P 56—Pedigree breeding for egg production.
P 78—Corn vs. barley.
P 83—Skim-milk vs. beefscrap vs. meat.
P 88—Effect of various animal feeds on fertility.
P 93—Roots vs. clover.
P 94—Roots vs. clover vs. sprouted oats.
P 95—Roots vs. clover vs. sprouted oats vs. Epsom salts.
P 106—Snow vs. water.
P 111—Breeding for fertility, hatchability and viability of chicks.
(*a*) Hens vs. pullets.
P 113—Relation of winter production to fertility, hatchability and viability of chicks.
P 114—Breeding for size of eggs.
P 150—Egg preservatives.
P 154—Time taken for tending trap nests.
P 157—Improving quality of poultry in district.
P 159—Effect of various green feeds on fertility.
P 163—Relation between annual production and date first egg is laid.
P 134—Intestinal parasitism of fowl.

BEEKEEPING

THE SEASON

The year 1928 was as a whole favourable to the production of honey in lower Quebec. The winter of 1927-28 was also favourable to the 91 colonies that had been wintered, only two of which died during the winter. The spring was rather long and cold. The dandelions, the first nectar-bearing flowers, made their first appearance on May 29 and fruit trees began to bloom on June 9. The bees made only a few flights in May and in early June on account of the cold weather.

The number of hours of sunshine and the rain recorded during the season are shown in the following table:—

	Hours of sunshine	Inches of precipitation
May	145·50	5·49
June	132·30	4·10
July	262·45	3·21
August	175·15	2·96
September	176·40	1·50

At the end of May, after the weak or queenless colonies had been united, 82 colonies were left, 76 of which were in the Station's apiary and 6 in the out-apiary.

The honey season was longer than usual on account of the abundance of clover, which is the only source of honey in this district, and on account of the cool weather; it lasted from June 30 to August 10. The swarming period was also longer than usual, lasting until the end of August.

The honey crop from the Station's apiary was 6,241 pounds, an average of 82 pounds per colony; the crop at the out-apiary was 315·12 pounds, an average of 52·10 pounds per colony. The strongest colony in the Station's apiary gave 230 pounds of honey. From August 12 onward, the bees harvested just enough honey for their own maintenance.

During the summer, all the two-year-old queens were replaced. Out of 36 queens, 31 were accepted.

The weather was favourable for the bees in the fall; feeding was done under good conditions. Ninety-seven colonies were wintered, ninety-four in the Station's apiary and three in the out-apiary. Seventy-six colonies were put in the cellar on November 6, while the twenty-three others were placed in wintering cases on October 6 and 18.

Several apiaries of the district were inspected during the year. The Station's apiary was visited by a large number of beekeepers and a field day held on July 4 was attended by over 60 beekeepers. Hundreds of circulars giving information on beekeeping were distributed by the office.

CONTROL OF SWARMING BY DEQUEENING AND REQUEENING

Procedure.—At the first appearance of larvæ in the royal cells, the queen was taken from the colony and all the royal cells were destroyed. Nine days after a second visit was made and the larvæ in royal cells were again destroyed. Of the ten colonies treated, young fertilized queens were introduced in five colonies after the second inspection and one royal cell was left in the five other colonies, no young queen being available.

Of the ten colonies treated, only one swarmed after the treatment. The average yield of honey produced by the ten colonies was 106·6 pounds. As there were in this lot three young queens when the first queen cells were destroyed, each queen with two frames of brood were selected to form three new colonies. This lot was therefore increased by four colonies.

CONTROL OF SWARMING BY SEPARATION OF BROOD FROM QUEEN

At the first appearance of larvæ in the queen cells, all the royal cells were destroyed. All frames containing brood were placed in a super. The queen was left in the lower part, and the hive was filled with drawn combs. A queen excluder was installed and supers containing honey were placed over it, and finally the super containing brood. Nine days later, an examination was made of the super containing brood and all the queen cells were destroyed. The six colonies thus treated gave an average yield of 111·57 pounds per colony. Three colonies swarmed after treatment. In one of these three colonies, one frame containing young brood was left with the queen at the time of the separation of the brood from the queen, which explains why queen cells were built on the frame of young brood. Of the two others, one swarmed twenty-three days and the other twenty-eight days after treatment.

CONTROL OF SWARMING BY ARTIFICIAL SWARMING FOR THE PRODUCTION OF HONEY IN SECTIONS

At the beginning of the main clover flow, a very strong colony was selected for this experiment. It was removed from its support and a new hive containing

twc drawn combs in the centre, and full sheets of foundation on each side, was put in its place. The queen of the treated hive was put in a cage during handling to avoid loss or injury. Later, all the bees from the brood chamber were shaken in front of the new hive. After the greater part of the bees had returned to this hive, the queen was introduced on the top between the two centre frames. A queen-excluder was placed between the section supers and the hive. New supers were added as needed during the honey flow. A young fertile queen was introduced in the original hive, which contained practically nothing but brood. This hive was left beside the swarm, the entrance turned at right angle to the new hive and left in this position for three days. At the end of three days, the hive was placed in the same position as the swarm, the two entrances being beside each other. Five days later it was removed to another part of the apiary. This removal was done on a fine morning when a great many bees were out of the hive. No swarming preparations were noticed in this hive and the yield obtained amounted to 61 pounds of extracted honey.

The shook swarm made swarming preparations fifty-three days after treatment; this is probably due to the fact that on this date the bees had nothing more to harvest and the colony was very populous. This swarm produced sixty-five sections No. 1, six sections No. 2, and twenty-seven sections No. 3, a total of ninety-eight sections, and in addition 46 pounds of extracted honey. If the whole crop is valued as extracted honey, on the basis that a section No. 1 is equivalent to 1½ pounds of extracted honey, the total yield for the swarm and the parent colony is 230 pounds of honey. There were in addition two colonies in good condition for wintering in the fall.

METHOD OF DETECTING SWARMING PREPARATIONS

In the spring, ten 10-frame Langstroth hives were chosen for this experiment; a half-super was given as an addition to the brood chamber. During the swarming period, these hives were examined every nine days by lifting the rear of the half-super to discover the presence of queen cells containing larvæ in the lower part of the frames. When no queen cells were observed, the super was put back into place without examining the brood chamber. If, on the other hand, the presence of queen cells was observed, the brood chamber was examined and swarming control was practised. All ten colonies made swarming preparations. Queen cells were found in the super and in the brood chamber of eight colonies. The two others had cells only in the super. It appears that it is easy to detect swarming preparations by this method, which allows at the same time the examination of a large number of hives in a comparatively short time.

WINTERING IN CELLAR

On account of the ever-increasing number of colonies, our bee cellar had to be enlarged so as to give each colony the necessary space, which is 10 cubic feet. No system of ventilation had been provided for during previous years, which occasioned a great deal of work when it was necessary to ventilate. A fresh air inlet, 5 inches square, was installed on the north side, allowing for the entrance of fresh air and the maintenance of the cellar at a more regular temperature in the fall and in the spring. This ventilator was left open in November, December, March, and April. It was closed only during the coldest part of January and February. The cellar remained quite dry, the humidity varying between 30 to 39 degrees, and the bees remained quiet during the whole winter.

Out of the 68 colonies placed in the cellar, one died during the winter and two suffered slightly from dysentery at the end of April. They were placed in the cellar on November 19 and taken out on April 28. The average quantity of stores consumed per colony amounted to 14 pounds. Two hives were placed

on scales and a thermometer was placed in the centre of the cellar. The weight of the hives as well as the temperature of the cellar were recorded every week. The average temperature recorded during the winter was 46·6°; the maximum temperature was 49·4° and the minimum 42·0°. The colonies were very strong when taken out in the spring. One of the hives on scales which had eight frames of bees when put in the cellar consumed regularly one-half pound per week.

The observations that we were able to make during this experiment show that to be suitable for bees, a cellar must be well-ventilated and of proportional size to the number of hives that have to be stored. It should be kept at as uniform a temperature as possible, between 45 and 48 degrees, and it must be very dry. The entrances of the hives should be left completely open. The cellar must also be kept very clean. If the floor is concrete or wood, the dead bees should be swept out once a month.

WINTERING IN FOUR-COLONY CASES

Two wintering cases containing four colonies each were used for this experiment. The hives were weighed and put in the wintering cases on October 3; sugar syrup was given to supplement their winter stores. The weight of the hives was increased from 75 to 80 pounds for 10-frame Langstroth hives. In two of the hives the entrance was facing the northeast and in the two others facing the southwest. The two cases were placed alongside each other. The insulation used was planing mill shavings four inches thick at the bottom and around the hives. When cold weather arrived the hives were covered with another layer of ten inches of shavings. Two openings, 1 inch in diameter, were made in the upper part of each case, opposite each other, to provide for ventilation above the shavings. An entrance 1 inch by ½ inch was left. The hives were taken out of the cases on June 10. The eight wintered colonies were in good condition in the spring and gave an average yield of 99·15 pounds of honey. The average production in the last five years was 77·10 pounds per colony.

WINTERING IN THREE-COLONY CASES

Three cases containing three colonies each were used. All the entrances to the hives were facing south and the hives were placed alongside each other. Five inches of planing mill shavings were placed on the bottom, 3½ inches around the hives and 8 inches on top. Three 10-frame Langstroth hives were wintered in the Station's apiary. They were put in the wintering cases on October 3 and taken out on June 10. The three hives wintered well and gave an average production of 82 pounds 2 ounces. The six other colonies were wintered in the out-apiary and were of the 10-frame Jumbo type. They were put in the wintering cases on October 16 and taken out on June 8. The hives were unusually strong in bees and in brood. The average production given by the six colonies was 52 pounds 10 ounces. Furthermore, we had eleven colonies in the fall.

WINTERING IN TWO-COLONY CASES

Four colonies were placed in two-colony cases. Two of these colonies were given a half-super in addition to the brood chamber. They were put in the wintering cases on October 3 and taken out on June 10. Here again, planing mill shavings were used; six inches were placed on the bottom and around the hives. The hives were placed alongside each other with the entrances facing south. One colony died during the winter but it was not due to the method of wintering nor to the lack of stores. The three others gave an average production of 66 pounds of honey. Two of the hives had a half-super in addition to the brood chamber.

WINTERING IN ONE-COLONY CASES

Two hives were wintered in one-colony wintering cases with the entrance facing south. They were put in the cases on October 3 and taken out on June 10. Five inches of packing material were placed in the bottom and around the hive and 10 inches on top. Planing mill shavings were used in one colony and well-dried maple leaves in the other. One colony wintered well while the other one remained weak; this was due to the fact that its queen was slow in laying in the spring. This accounts for the differences in the production of the two colonies. One yielded 167·8 pounds and the other 22·8 pounds of honey.

TWO-QUEEN SYSTEM

In order to preserve or insure a supply of extra young queens in the spring, the brood chamber of four hives was divided in two sections. The two groups of bees were completely isolated from each other by a partition placed in the centre. Each group had a queen. These hives wintered satisfactorily. Two of the eight queens died during the winter. Out of the six left in the spring, five were introduced in queenless hives, and the sixth was kept to form a new colony which developed well and gave 89 pounds of honey.

RETURNS FROM APIARY

Because of various experimental projects that are being conducted in the apiary which greatly interfere with normal production, it is impossible to arrive at a fair average production for the whole apiary, therefore, ten colonies are set aside to be run for honey production alone on a commercial basis and to manage these colonies according to improved methods throughout the season. All colonies wintered well, but one of them became queenless at the beginning of May, another young queen was immediately introduced. During the summer colony No. 10 developed sac brood, the queen was replaced and the disease soon disappeared. Eight colonies made preparations for swarming but effective control measures were applied. One colony was divided. No. 3 lost its young queen during the mating flight and remained queenless, which explains the low yield. No increase was made during the year and the total production of the group was 1,239·12 pounds, an average of 123·9 pounds per colony. Individual colony production is shown in the following table:—

YIELD PER COLONY

Colony No.	Yield	
1	105·8	pounds
2	143	"
3	55	"
4	100	"
5	156	"
6	180·12	"
7	111·8	"
8	103	"
9	114	"
10	171	"

STATEMENT

Receipts:—		
1,239·12 pounds of honey at 16 cents	$ 198 36	
8 pounds of wax at 40 cents	3 20	
		$ 201 56
Expenditure:—		
Interest on capital, hives and equipment...., $300 at 6 per cent.	$ 18 00	
Cost of honey and sugar for feeding:		
185 pounds of sugar at $6.50	12 03	
80 pounds of honey at 16 cents	12 80	
110 hours of labour at 35 cents	38 50	
		$ 81 33
Net profit		$ 120 23

HONEY PRODUCTION AND PROFIT FOR A FIVE-YEAR PERIOD FOR TEN COLONIES

Year	Average production per colony		Net profit per year	
	lb.	oz.	$	cts.
1924	67	9	81	02
1925	94	6	117	92
1926	50	13	41	63
1927	74	07	58	07
1928	123	9	120	23
Average for 5 years	82·15		83	77

There is only one crop of only 30 days duration in this district on white clover and alsike clover. In districts where there are other honey plants than clover, such as buckwheat, fireweed and sweet clover, the returns as well as the yields given by the colonies may be considerably higher.

COMPARISON OF DIFFERENT SIZES OF HIVES

Tests were made with five different sizes of hives to determine their relative value and their effect on wintering, swarming and honey production. The results obtained are as follows:—

RESULTS OF COMPARISON OF DIFFERENT SIZES OF HIVES

Number of hives	Sizes of hives	1928				Average of four years				
		Average production per colony		Average honey consumed in wintering		Average swarming	Average quantity of stores consumed in wintering		Average production of honey per colony	
		lb.	oz.	lb.	oz.	%	lb.	oz.	lb.	oz.
2	8 Frame Langstroth	51	12	13	4	87½	11	3	38	10
1	9 "	74	8	22	8	50	14	8	71	2
2	10 "	142	8	22	4	62	14	11	95	8
2	12 "	137	8	20	8	.....	15	8	88	13
2	10 Frame Jumbo	108	8	24	4	75	17		54	2

Two nine-frame hives were wintered; one died during the winter and was not replaced. This explains why there is only one nine-frame hive in the table for 1928. There were two hives in other years. The results for four years appear to show that the Langstroth hive is the most satisfactory for the district, for wintering as well as for honey production. It is easy to control swarming with this type of hive and it is also easily handled. It should be noted also that the 12-frame hives wintered very poorly in the last four years, and this size hive is not to be recommended.

VALUE OF STIMULATIVE FEEDING FOR BROOD PRODUCTION

Ten colonies were used for this experiment; five were fed a 65 per cent sugar syrup during the whole month of May until the dandelion flow. Syrup was always available. The five other colonies had enough honey for their spring needs. The average production given by the group that received stimulative feeding was 106·3 pounds per colony and for the other group, 85·12 pounds. One colony in each group was divided.

WINTERING IN CELLAR AND IN WINTERING CASES

The seventeen colonies wintered outside were used for this experiment and they were compared with an equal number of colonies wintered in the cellar. In the spring, after weak or queenless colonies had been united and the winter losses had been subtracted, there remained sixteen colonies in the wintering-case group; one colony died during the winter. Fifteen colonies remained in the cellar-wintered group. One colony had died and another one was very weak and was robbed a few days after it was taken out. On June 10, the average number of bees and brood frames was as follows:—

Method of wintering	Cellar	Case
Number of frames of bees	9·5	11·6
Number of frames of brood	6·9	8

The colonies in wintering cases multiplied more rapidly than the others as they did not suffer from cold in May, which is the usual cause of the slow increase of hives wintered in the cellar.

The average production per colony was 61·11 pounds for the cellar-wintered group and 89·10 pounds for the group in wintering cases. Four swarms were given by the group wintered in wintering cases. This group included twenty colonies in good condition in the fall. No swarm was given by the cellar-wintered group; fourteen colonies were in good condition in the fall; there was therefore a decrease of three colonies in this group.

WINTERING BEES IN DOUBLE HIVES

Six colonies were wintered; three had a full-depth super in addition to the brood chamber and they were wintered in the cellar. The three others had only a half super in addition to the brood chamber. Two of these were wintered in wintering cases and one in the cellar. Five colonies were in 10-frame hives and one in a 9-frame hive. The latter died during the winter. Another one was weak in the spring and was united. It was observed that the colonies wintered in the cellar consumed an average of 24 pounds of honey, which is a rather large quantity. One of these hives was placed on scales and consumed 1 to 1½ pound more per month than an ordinary hive. The increase is specially large in April. As regards the yield of honey, these colonies were not superior to the others.

The two hives wintered in wintering cases were in good condition. One gave 69 pounds and the other 84 pounds of honey. We are inclined to think that this kind of hive is quite suitable for outdoor wintering, as a large quantity of stores may be given and the feeding of syrup in the spring may be avoided. The bees are not disturbed so often and there is a saving of labour. It should be noted that these two colonies were wintered in the same wintering case and in the same conditions since 1925 and that they are still in good condition at the beginning of the fifth winter.

SPRING PROTECTION OF BROOD-CHAMBER

Ten colonies were divided into equal lots. In the first lot, as soon as they were taken out of the cellar, the hives were protected by an outside case until June 10. The protected group had an average of 10 frames of bees and 7·3 of brood. The unprotected group had an average of 8·1 frames of bees and 5·2 frames of brood. The average production per colony in the protected group was 90·1 pounds against 82·8 pounds for the unprotected group. The protected group gave 2 swarms; the unprotected one, none.

As our apiary has good natural protection in the shape of a board fence, it may be taken for granted that these cases would be still more useful and the difference in yield still greater in the case of colonies exposed to the wind.

COMPARISON OF DIFFERENT RACES OF BEES

Three colonies were used for this experiment: one of Italian bees, one of Carniolan bees, and one of black bees. The three colonies made swarming preparations. The Carniolan colony was divided and the two others were controlled. The production of each colony was as follows: Italian bees, 180·12 pounds; Carniolan bees, 120 pounds; and black bees, 167·8 pounds. There was no increase in the fall. The Carniolan colony lost its queen and was united to its swarm. The Italian and Carniolan bees were wintered in the cellar and the black bees were wintered in wintering-cases.

RELATION OF STRENGTH OF COLONY IN BEES AND BROOD TO THE HONEY CROP

Ten colonies were used for this experiment. Five were wintered in the cellar and five in wintering-cases. The number of frames covered by bees and brood was carefully noted at the first inspection in the spring and at the beginning of the honey flow. As was expected, the colonies strong in bees and in brood, in May and in June, gave the largest crop of honey.

RELATION BETWEEN DIVIDED AND UNDIVIDED COLONIES AND HONEY CROP

Fourteen colonies were used in this experiment. Seven of these were divided. Little difference in the production of the two groups was noted, as the season was favourable to honey production. The colonies were divided at the beginning of the crop. The average production for the divided group was 132·14 pounds and for the undivided group, 142·12 pounds.

However, the divided group was increased to 14 colonies and 2 colonies were queenless in the fall. There remained therefore 12 colonies in good condition for wintering; this is an increase of 5 colonies valued at $7 each, or $35 for this group. The value of the honey crop was $159.88 for the undivided group and $148.80 for the other group. If the value of the increase is added to the value of the crop, the total is $183.80 for the divided group, or an average value of $22.84 per colony for the undivided group and $26.26 for the divided group.

OUT-APIARY

This apiary is located about four miles from the Station; it includes 6 colonies in 10-frame Jumbo hives. They were wintered in 3-colony cases. They were all in perfect condition in the spring. On June 4 swarming preparations were noticed. Four were divided and two swarmed; the apiary was thus increased to 12 colonies. The total production of the apiary was 315·12 pounds. The highest yield for one colony was 83 pounds. In the fall one colony was queenless and it was united. The others were in good condition for wintering. Three colonies were wintered in this apiary and the eight others were wintered in the Station's apiary.

LIST OF PROJECTS UNDERTAKEN FOR THE BEE-KEEPING DIVISION

Ap 11—Comparison of different stores for wintering.
Ap 25—Value of stimulative feeding for brood production.
Ap 45—Methods of increasing without natural swarming.
Ap 1—Control of swarming by dequeening and requeening.
Ap 2—Control of swarming by separation of brood and queen.

Ap 4—Control of swarming by artificial swarming.
Ap 5—Method of detecting swarming preparations.
Ap 31—How to prevent swarming by providing more space.
Ap 7—Wintering in cellar.
Ap 8—Wintering in 4-colony cases.
Ap 9—Wintering in 2-colony cases.
Ap 10—Wintering in single-colony cases.
Ap 49—Wintering in a double brood chamber.
Ap 30—Outdoor vs. cellar wintering.
Ap 12—Two-queen system.
Ap 20—Returns from the apiary.
Ap 21—Comparison of different sizes of hives.
Ap 28—Study of honey flow.
Ap 32—Spring protection of brood chamber.
Ap 33—Comparison of races of bees.
Ap 34—Queen breeding.
Ap 35—Production of comb honey and extracted honey.
Ap 36—Relation between the strength of colony in bees and in brood and the honey crop.
Ap 38—Comparison of different methods of introducing queens.
Ap 42—Protected and unprotected hives in summer.
Ap 55—Out-apiaries.
Ap 48—Tree fruit bloom as a source of nectar.

FLAX FOR FIBRE

With a view to helping those who still grow flax and to encourage others to make a start in the growing of this crop, a series of practical experiments, mainly on the choice of varieties and the preparation of the soil, were undertaken in 1923. Several lectures were given during the winter and a rather large quantity of flax-seed of good quality was distributed with the co-operation of the Provincial Department of Agriculture.

To give further assistance to those who would be willing to continue growing flax, a scutching unit was installed at the Ste. Anne Experimental Station with the help of the Central Farm at Ottawa, in order to scutch the flax of farmers who were willing to bring it to the Station.

The first year, nearly 400 farmers brought their flax; each one had an average of 120 pounds of flax straw which yielded an average of 8 pounds of fibre per 100 pounds of straw. While not much extension work was done outside, valuable and fairly complete explanations were given to interested parties on the quality of their flax and the comparison that each one was enabled to make between the various lots of fibre helped a great deal in improving the crop. In 1925, some 35,460 pounds of flax straw were received, yielding 10 pounds of fibre for 100 pounds of straw; this is a great improvement in the quality of the fibre as well as in the yield.

During the same year new varieties were placed under test and three other experiments were undertaken, one in connection with the rate of seeding, another one regarding the method of seeding and the third one including a test of chemical fertilizers. These experiments were conducted every year since and the results are given in the following tables.

During the winter of 1926-27, 42,040 pounds of flax were broken here, giving a yield of 12·2 pounds of fibre per 100 pounds of straw; this is again a considerable improvement as regards yield and quality.

Last winter, over 250 farmers brought their flax to be scutched. The total quantity scutched was 52,281 pounds of retted straw yielding 7,341 pounds of fibre, or 14 per cent.

The installation of facilities for scutching certainly greatly helped in revivin this industry. Requests were received from farmers in other districts, who had seen the machine in operation, for the establishment of a similar plant in their district. Similar plants are now in operation in Beauce, Dorchester and Charlevoix counties.

The firm of Dupuis Frères, of Montreal, opened a special branch two years ago for the purchase and sale of flax products, and fibre or linen and ready-to-wear articles may be purchased at this store. In the first year of its establishment, this firm sold, in Quebec only, over 2,000 pounds of Ontario fibre, which was woven by the farmers' wives of Quebec.

The temperature was favourable to flax growing this year. As a rule seeding was done fairly early and growth was regular and strong during the growing season. However, when retting time came, some lots of flax suffered from the lack of rain, and the flax was left too long on the ground.

FLAX—TEST OF VARIETIES

This test of varieties was undertaken in 1924 and continued every year since to determine the relative advantages of each variety. These varieties were sown in 120th-acre plots replicated three times.

The varieties tested, the yield of fibre and of tow given by each in 1928, as well as the average yield for a three-year period, are given in the following table. The highest yields obtained in 1928 were given by the varieties recently introduced in Canada by the Central Experimental Farm in Ottawa.

A selection named "Pure Line No. 6" propagated by the Department of Agriculture of North Ireland, heads the list this year and comes fifth for the average yield for three years. The fibre secured this year is generally longer and of better quality than that obtained from our common varieties.

The J.W.S. flax is also a selection of Irish source introduced into this country three years ago. This variety, as in the case of the preceding one, gave a very good yield of fine quality fibre.

Selection 829C gave also a long fibre of very good quality. The other varieties included in the table gave fairly good yields of fibre; however, the quality of the fibre is much below that of the two first varieties mentioned.

FLAX—TEST OF VARIETIES

—	Three-year average					Yield per acre in 1928	
	Number of days maturing	Yield of retted straw per acre	Yield of seed per acre	Yield of fibre per acre	Yield of tow per acre	Fibre	Tow
	days	lb.	lb.	lb.	lb.	lb.	lb.
Pure Line No. 6	90·3	2,298	724	366	260	499	240
J. W. Stewart	93·6	2,800	598	392	235	472	212
Blue Dutch Blossom	94	2,256	801	280	294	373	193
829 C	92·6	2,400	764	395	200	452	215
Longstem	100·4	2,280	780	407	242	440	360
Saginaw	96·6	2,232	712	388	243	437	250
Riga Blue	90·5	1,938	674	306	227	442	230

METHOD OF SEEDING FLAX

Flax for fibre production has always been sown broadcast. However, in order to see if this method was the best, some plots were sown in rows in 1925 and each year since, in the same manner as for wheat or oats. A 120th-acre plot replicated three times was used for this experiment. Broadcasting was done by hand and the seed was covered with a rake; drill-seeding was done with a Planet Junior seeder in rows 6 inches apart.

RESULTS OF DIFFERENT METHODS OF SEEDING FLAX

—	Three-year average					Yield per acre in 1928	
	Number of days maturing	Yield of retted straw per acre	Yield of seed per acre	Yield of fibre per acre	Yield of tow per acre	Fibre	Tow
	days	lb.	lb.	lb.	lb.	lb.	lb.
Riga Blue in rows	87·4	1,784	662	322	179	270	142
Riga Blue broadcast	87·4	2,144	708	447	239	392	212

As shown by the above table, all yields obtained to date show a very large increase in favour of broadcast seeding. It is also easier to obtain flax of uniform size and not too fine by seeding broadcast than by seeding in rows.

FLAX—SEEDING AT DIFFERENT DATES

This experiment has been conducted for a number of years on the Station with the object of ascertaining the effect of seeding as early as possible in the spring and at one-week intervals thereafter, on the yield of the crop.

As it may be seen in the following table, good results were obtained from all the seedings. In this kind of experiment the temperature as well as the soil has such an effect on the results that it may be necessary to wait a few more years before concluding in favour of one date or another. However, it may be said that one objection to the later seedings is that retting can rarely be done in the fall.

FLAX—SEEDING AT DIFFERENT DATES

—	Three-year average					Yield per acre in 1928	
	Number of days maturing	Yield of retted straw per acre	Yield of seed per acre	Yield of fibre per acre	Yield of tow per acre	Fibre	Tow
	days	lb.	lb.	lb.	lb.	lb.	lb.
Riga Blue, 1st seeding	87·3	2,116	741	315	246	232	223
Riga Blue, 2nd seeding	90·3	1,836	640	301	175	347	202
Riga Blue, 3rd seeding	96·3	2,044	706	311	194	328	152
Riga Blue, 4th seeding	99·3	2,117	650	323	234	322	184

FLAX—RATES OF SEEDING

The object of this experiment is to determine the rate of seeding which will produce the highest and most economical yields of fibre.

The results obtained this year showed a marked advantage in favour of 84 pounds per acre, which is the quantity usually sown. On the other hand, the results obtained in the two previous years appeared to show that a larger quantity of seed would give a better yield of fibre.

FLAX—RATE OF SEEDING PER ACRE

——	Three-year average					Yield per acre in 1928	
	Number of days maturing	Yield of retted straw per acre	Yield of seed per acre	Yiled of fibre per acre	Yield of tow per acre	Fibre	Tow
	days	lb.	lb.	lb.	lb.	lb.	lb.
Riga Blue, 84 pounds per acre.	87·3	2,232	772	343	242	452	223
Riga Blue, 98 pounds per acre.	87·6	2,104	700	336	258	373	185
Riga Blue, 112 pounds per acre	88·3	2,039	682	363	231	377	200

FLAX—TEST OF CHEMICAL FERTILIZERS

This experiment was undertaken in 1925 and continued each year since; the object was to ascertain whether the application of various quantities of chemical fertilizers would produce a sufficient increase in the yield of fibre to justify the expenditure.

The results of the first two years show no marked advantage resulting from the application of one or the other of the fertilizers. This year heavier applications of fertilizers gave a rather large increase in the yield of seed and fibre. However, before making any deductions in favour of one fertilizer or the other, as well as one quantity or the other, these tests will be continued a few more years.

LIST OF PROJECTS UNDERTAKEN FOR THE FIBRE DIVISION

E 3—Test of varieties.
E 5—Methods of seeding.
E 7—Seeding at different dates.
E 9—Rate of seeding flax.
E 13—Test of chemical fertilizers for flax.
E 26—Cost of flax production.

EXPERIMENT WITH CHEMICAL FERTILIZERS, LIME, GROUND LIMESTONE AND MANURE

(Project C. 132)

The object of this experiment is to ascertain the influence of various amendments and fertilizers on the yields of crops in a four-year rotation on drained land; this experiment was undertaken in 1924 in duplicate plots one-fortieth of an acre each, including two check plots.

The rotation is as follows:—

First year—Intertilled crop, swede turnips.
Second year—Cereal, barley.
Third year—Clover hay.
Fourth year—Timothy hay.

The ploughing for swede turnips is done in the fall and all the fertilizers are applied on the ploughed soil in the spring.

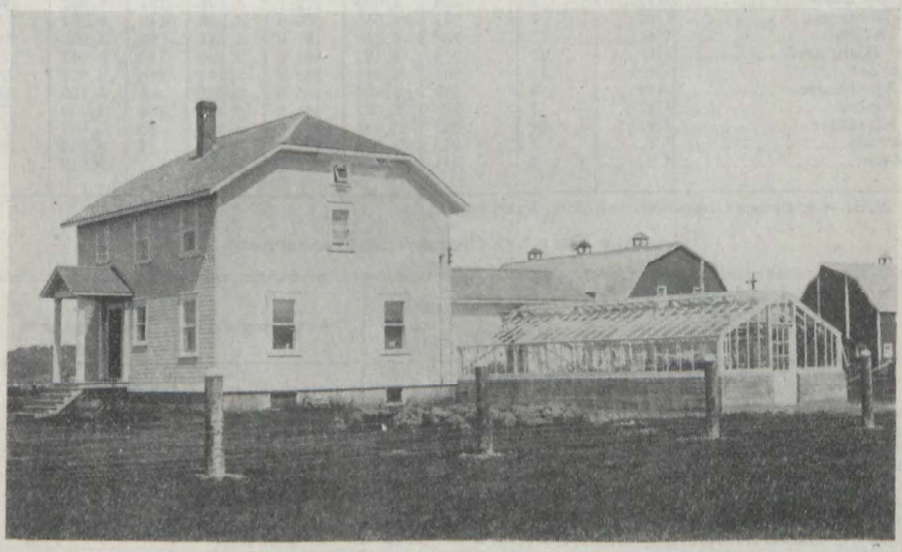
The results obtained to date are still somewhat irregular, due probably to variations of soil on certain sections of the field, and for this reason the yields given in the following table do not perhaps correspond closely with the quantity of fertilizers applied.

A second cycle of the rotation was started with swede turnips this year, and it is hoped that the yields will correspond better this time to the fertilizer applications.

The yields for 1928 given by the different crops in the rotation, as well as the average yields obtained to date, are given in the following table:—

RESULTS OF EXPERIMENT WITH CHEMICAL FERTILIZERS, LIME, GROUND LIMESTONE AND MANURE

Plot No.	Fertilizer applied per acre	Yields per acre											
		Turnips				Barley				Clover hay				Timothy hay			
		1928		Average of 5 years		1928		Average of 4 years		1928		Average of 3 years		1928		Average of 2 years	
		tons	lb.	tons	lb.	bush.	lb.	bush.	lb.	tons	lb.	tons	lb.	tons	lb.	tons	lb.
1	Ground limestone—4,000 pounds	16	1,795	16	1,144	43	10	49	34	2	1,040	2	443	2	1,280	2	1,380
2	Burnt lime—2,240 pounds	14	1,557	16	187	40	00	43	38	2	1,300	2	186	2	440	2	920
3	Basic slag (16 P^2O^5) 750 pounds	16	1,744	16	1,437	36	34	41	10	2	1,420	2	780	2	450	2	985
4	Check	19	390	17	1,503	35	39	44	00	2	980	2	623	1	1,640	2	440
5	Superphosphate—750 pounds	21	166	19	1,999	37	24	43	38	2	1,240	2	677	2	1,000	2	1,560
6	Barnyard manure—20 tons	23	522	21	1,932	37	24	44	38	2	1,140	2	803	2	1,660	2	1,780
7	Manure—20 tons Ground limestone—4,000 pounds	25	1,575	22	1,359	38	14	44	14	2	900	2	1,043	2	1,760	2	1,950
8	Manure—10 tons Nitrate of soda—100 pounds Sulphate of ammonia—75 pounds Superphosphate—400 pounds Muriate of potash—100 pounds	21	340	20	1,555	32	24	35	43	2	1,160	2	773	2	40	2	930
9	Nitrate of soda—100 pounds Sulphate of ammonia—75 pounds Superphosphate—400 pounds Muriate of potash—100 pounds	19	1,494	20	159	35	00	37	19	2	900	2	833	2	850	2	1,175
10	Nitrate of soda—100 pounds Sulphate of ammonia—75 pounds Superphosphate—400 pounds	19	158	18	337	33	14	36	19	2	920	2	496	2	730	2	1,035
11	Check	15	491	14	1,339	32	43	38	05	2	200	1	1,963	2	340	2	1,610
12	Nitrate of soda—100 pounds Sulphate of ammonia—75 pounds Muriate of potash—100 pounds	13	444	16	582	35	00	41	24	2	600	2	223	2	800	2	990
13	Superphosphate—400 pounds Muriate of potash—100 pounds	21	1,686	18	1,589	38	39	42	10	2	1,040	1	1,646	2	720	2	1,110



Laboratory of plant pathology at Ste. Anne.

GENERAL NOTES

ILLUSTRATION STATIONS

Twenty-two illustration stations were under the general supervision of the Ste. Anne de la Pocatière Experimental Station in 1928. In addition to the monthly visit made by the inspector from this office, the writer has had the opportunity of visiting all these farms during the year and also of making special visits when meetings were being held or for the establishment of new illustration stations.

With the exception of a few stations that were more affected by the poor season of 1928 than the others, these illustration stations are doing splendid agricultural demonstration work, as shown by the following tables on dairy herd production and average cost on the crops for all the illustration stations.

Endeavours are made on all these Stations to demonstrate the best crops and the best methods to follow for increasing the yield, improving the quality, and at the same time lowering the cost of production.

The following tables show the possibilities of improvement on the illustration stations as well as on the farms of the district where they are located.

MILK AND BUTTER-FAT PRODUCTION ON ILLUSTRATION STATIONS IN EASTERN QUEBEC

Stations	Breed	Number of cows	Average number of days in milk	Average production		Lowest production		Highest production	
				Milk	Fat	Milk	Fat	Milk	Fat
			days	lb.	lb.	lb.	lb.	lb.	lb.
Plessisville	Cr.	10	279	9,049	317·6	5,920	208	10,221	309
Valley Jct	Cr.	12	290	7,296	286·2	5,075	214	8,715	359
South Roxton	Ayr.	16	302	7,088	295·7	5,784	265	10,516	444
N.D. de Ham	Ayr.	13	262	6,186	242	4,516	189	10,218	414
Mégantic	Cr.	8	221	6,183	233·5	4,942	167	8,944	315
Montmagny	Ayr.	10	256	5,973	235·8	4,632	211	8,928	333
Weedon	Cr.	10	281	5,900	216·3	4,464	165	7,541	305
St. Alexandre	Cr.	12	244	5,820	222·6	5,127	196	6,995	278
Bromptonville	Ayr.	17	265	5,175	197·6	2,351	99	7,268	294
Black Lake	Cr.	25	247	4,764	195·5	4,002	133	5,573	229
Rivière Bleue	Ayr.	9	248	4,620	172·7	3,197	121	6,232	203
St. Alphonse	Cr.	7	211	4,555	200·0	3,258	149	6,331	258
St. Fabien	Cr.	15	230	4,349	167·0	2,581	95	4,909	190
New Richmond	Cr.	10	212	4,187	164·0	3,196	140	5,017	174
Scott Jct	Cr.	11	246	3,943	160·0	2,762	116	4,977	229
St. Apollinaire	Ayr.	8	240	3,905	136·0	2,297	93	5,109	198
St. Arsène	Cr.	7	276	3,637	141·2	2,390	100	4,439	174
St. Eleuthère	Cr.	21	232	3,251	111·3	2,261	86	5,642	181
Nouvelle	Cr.	3	214	3,030	121·2	1,915	74	3,840	155
Matane	Cr.	9	311	8,100	.....	4,810	.....	9,949	.....

N.B.—Cr. means Cross-bred and Ayr. Ayrshire.

AVERAGE YIELD AND COST OF CROP PRODUCTION

Crops	Number of stations	Average yield	Average cost
			$ cts.
Swede turnips	18	18·7 tons	3 63
Corn	5	18·2 "	2 52
Sunflowers	1	10·0 "	3 55
Potatoes	7	221·5 bushels	0 28 3/10
Oat and pea fodder	9	2·79 tons	9 03
Oats	11	39·3 bushels	0 64 1/4
Barley	4	30 "	0 65
Clover	16	2·07 tons	7 85
Timothy	11	2·07 "	6 90

EXTENSION WORK

As in other years, an exhibit was prepared and shown at most of the local fairs. A group of Percheron horses was exhibited with much success at the Quebec Provincial and District Fair, as well as at the annual Horse Fair of Ste. Anne de la Pocatière.

Several field days were arranged for farmers. These meetings are increasingly popular and are always well attended.

As much help as possible was given by the writer and his assistants to the various agricultural organizations of the district.

During the year, 5,892 letters were received and 5,898 sent. In addition, 825 circular letters and 4,680 weekly reports on the laying contests were forwarded.

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