DOMINION OF CANADA

DEPARTMENT OF AGRICULTURE

DOMINION EXPERIMENTAL FARMS

EXPERIMENTAL STATION

LA FERME, P.Q.

REPORT OF THE SUPERINTENDENT

PASCAL FORTIER

FOR THE YEAR 1930

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EXPERIMENTAL STATION, LA FERME, P.Q.

REPORT OF THE SUPERINTENDENT, PASCAL FORTIER

THE SEASON

The average temperature recorded for the period including January, February, March and April, was 6·56 degrees lower than the average for the last thirteen years. During the same months, the total precipitation was 1·43 inches below the average for the last thirteen years, while the total number of hours of sunshine exceeded by 36·9 hours the average recorded for a period of ten years.

The average temperature during the growing season—May, June, July, August and September—was 5·83 degrees F. higher than the average for thirteen years. The rainfall during this same period was only 0·72 inches higher than the average of a thirteen year period. June witnessed the heaviest rains, when a total of 8·28 inches was recorded; or 4·69 inches higher than the average for thirteen years. There were 153·2 hours of sunshine less than the average for the last ten years. The longest period without frosts was 110 days—May 30 to September 11.

During the last three months of the year, the temperature was 8·35 degrees F. higher than the thirteen-year average, and ploughing could be performed until the middle of November. The rainfall recorded was 2·12 lower than the average for the last thirteen years, and there were also 18·2 hours of sunshine less than the average for a ten-year period.

The following table contains other details relating to seasonal conditions which prevailed during the year:—

METEOROLOGICAL RECORDS AT LA FERME, QUE., 1930

Month	Temperature (F.)						Precipitation				Sunshine	
	Mean		Maximum		Minimum		Rain	Snow	Total precipitation		1930	Ten year average
	1930	13-year average	Maximum	Mean maximum	Minimum	Mean minimum			1930	13-year average		
	°	°	°	°	°	°	in.	in.	in.	in.	hours	hours
January	−0·5	−2·58	35	30·6	−36	−41·4	.....	13·5	1·35	1·82	70·3	89·6
February	0·67	1·63	49	38·0	−45	−37·2	0·40	14·0	1·80	1·40	114·9	108·3
March	11·16	16·10	35	47·5	−25	−24·8	.....	14·5	1·45	1·82	113·3	137·2
April	28·46	30·65	61	62·8	— 1	— 3·23	1·45	7·5	2·20	2·39	165·5	165·8
May	47·20	45·97	79	79·3	24	16·67	1·33	0·5	1·38	2·40	184·8	199·3
June	60·24	56·20	80	84·5	38	28·8	8·28	.....	8·28	3·59	152·8	232·4
July	59·02	61·58	81	84·6	32	35·0	3·48	.....	3·48	4·06	213·8	235·0
August	60·55	59·22	80	82·1	36	35·1	2·13	.....	2·13	3·88	206·6	209·8
September	51·11	50·26	77	76·7	25	27·3	2·91	.....	2·91	3·08	96·6	131·3
October	41·82	38·82	74	65·7	14	13·6	1·16	5·0	1·66	2·85	110·0	84·5
November	29·05	24·23	54	48·6	— 4	−11·38	1·32	2·5	1·57	2·03	25·9	43·4
December	8·50	8·07	36	37·3	— 3	−30·7	.....	19·0	1·90	2·37	13·7	39·9
Total	.....	.....	.....	.....	.....	.....	22·46	76·5	30·11	27·16	1,463·2	1,676·5

EVAPORATION COMPARED WITH PRECIPITATION

This project, begun in 1925, was continued during the year. Observations were made in June, July, August and September, the period of active growth, on the difference between the quantity of rain falling in a vat left outside and the quantity of water evaporating from this vat.

A cylindrical vat, measuring 4 feet in depth and 6 feet in diameter, is sunk in the ground, so that its upper edge is only 4 inches above the surface of the soil. The vat is then filled with water up to 4 inches from the top, or, in other words, even with the surface of the soil outside. Care is taken to keep the grass well cut all around the vat to allow for the free action of the wind and sun, so that evaporation may not be lessened.

Variations above or below the given mark are carefully noted each week. After each reading, the level of the water is brought back to standard level, either by adding water when evaporation has exceeded precipitation, or by running off some of the water when the contrary takes place.

The variations noted in level are then compared with the quantity of rain, which is recorded by means of the rain gauge installed on the station. The object of this experiment is to determine the exact relation between precipitation and evaporation in this district, and to ascertain their influences on soil and crops. For instance, a reference to the following table, where the facts relating to this experiment are summarized, shows that evaporation was 5 inches lower than precipitation in June, 1930. During this month, the ground remained water-soaked, a condition which is very unfavourable to crops. From the deductions made during the other months, and from the average of the last five years, it appears that ideal conditions for growth are obtained when evaporation and precipitation balance each other from week to week. An excess of precipitation over evaporation or vice versa is harmful to crops, in proportion to the duration of such conditions. The average over a five-year period shows that precipitation has exceeded evaporation.

COMPARISON OF EVAPORATION AND PRECIPITATION

Month	1930			Five-year average		
	Precipitation	Evaporation	Excess of precipitation over evaporation	Precipitation	Evaporation	Excess of precipitation over evaporation
	in.	in.	in.	in.	in.	in.
June	8·28	3·28	5·0	5·53	3·14	1·00
July	3·48	2·48	1·0	4·46	3·16	1·20
August	2·13	0·63	1·5	3·47	3·29	1·23
September	2·91	2·41	−0·5	3·97	2·51	1·01
Total	16·80	8·80	7·0	17·43	11·10	4·44

ANIMAL HUSBANDRY

HORSES

At the end of December, 1930, there were in all 20 horses on the Station, as follows: eight pure-bred registered Canadians, including a five-year-old stallion; two male colts, 1½ years of age and 6 months old respectively; two mares, 6 and 7 years old; two fillies, 1½ years and 6 months old; four registered Percherons, including the stallion Ste-Anne Joffre 13664, 2½ years old, and the mares Belle (10632) 130717, 14 years old; Ste-Anne Julie 4th 13664, 6 years old; as well as a 6-months colt from the latter.

The other horses, from 8 to 20 years old, were grades, with characters of the Clyde, Percheron, and Canadian predominating.

INTRODUCTION OF PERCHERONS

After a careful study of the situation, it was decided to introduce Percheron blood into the stud. This inquiry shows that heavy draught horses are required for the heavy lands of the Abitibi and the work in lumber camps. Information supplied by several communities in the Abitibi showed that draught horses are imported each fall in the district for the needs of the lumber industry. Over $52,000 were expended in this manner in 1930 alone.

It is evident that the breeding of Percherons should be encouraged on account of the local demand. A request for horses of this breed was put in and in the fall of 1930 the four above-mentioned Percherons were received from the Experimental Station of Ste-Anne de la Pocatière.

The young stallion, Ste-Anne Joffre, weighing, as he does, 1,400 at 2½ years of age, should sire progeny of reasonable weight. There are mares of good quality in the district, and it is hoped that their owners will use them for breeding purposes; the success which has been obtained in the breeding of French-Canadian horses has shown conclusively that horse breeding can be just as successful in this district as anywhere else. There are plenty of good clover pastures in the district, and plenty of good clover hay, an economical feed, which stimulates the production of milk in the mare and promotes a rapid growth of the colts.

In view of these facts, the breeding of draught horses in the Abitibi appears to be a profitable industry and one that deserves the attention of the farmer as well as reasonable encouragement from the Government.

FEED AND MAINTENANCE COST OF DRAUGHT HORSES

The feed and maintenance costs of draught horses are always recorded, as well as the number of hours of horse labour. The following table gives the details of this experiment for one horse, as well as the cost of production of one hour of horse labour over a five-year period:—

FEED AND MAINTENANCE COST FOR ONE HORSE AND COST OF ONE HOUR OF HORSE LABOUR

Items	Cost	
	1930	Five year average
	$	$
2·56 tons round oats at $42.62 per ton	109 11	113 98
0·38 ton wheat bran at $33.76 per ton	12 83	14 50
3·02 tons hay at $10 per ton	30 20	50 01
Manual labour	14 00	16 13
Interest at the rate of 7 per cent on $175 (value of the horse)	12 25	15 78
Stable	10 48	10 46
Harness and repairs	8 34	6 85
Shoeing	12 00	11 05
Total cost	209 21	238 76
Number of hours of horse labour	1,948	2,114·4
Cost per hour of horse labour	cts. 10·7	cts. 11·3

CATTLE

DAIRYING

Steady progress in dairying in this district was again recorded in 1930, as shown by the production of two butter factories—Amos and Macamic. In 1929, the Amos butter factory produced 26,000 pounds of butter and in 1930, 67,837 pounds, while the Macamic creamery produced 20,187 pounds in 1929 and 44,560 pounds in 1930. This is an increase of 128 and 110 per cent respectively.

A large number of cows and heifers were introduced into this district during the year. They produced little or no milk this season but will start producing next year.

DAIRY CATTLE

On December 31, the herd was made up of an Ayrshire bull, Ottawa Supreme 88031, class A of the Advanced Registry, of twenty-three other registered Ayrshires and thirteen grade cows.

This herd has been accredited for six years and is also among the herds known to be free from contagious abortion, having successfully passed the blood test which indicates freedom from this disease. The following projects were carried during the year: improving the herd by means of selection; cost of feeding milch cows; cost of production of milk and of butter fat.

SELECTION AND GRADING UP

Certain cows of faulty conformation and others of poor milk production capacity were removed from the herd, which was improved thereby as well as by the greater care given to feeding, and the result was an increased production of milk. Thirteen cows completed their period of lactation, showing an increase in milk production of 239 pounds per cow over last year's average. The total average increase obtained over a four-year period amounts to 2,482 pounds; the average yield per cow is now 6,938 pounds. As the herd is now entirely free from contagious abortion, it is hoped that, with testing and individual attention in feeding, an average production of 8,000 pounds of milk per cow may be reached in a short time.

It should be stated that the average age of the cows is very low, 5·2 years, showing that some of the cows are in their first lactation period.

Not a single head was introduced from outside sources during the last few years, all the cows being raised and bred on this Station, with the exception of three that were supplied to us by the Central Experimental Farm in 1921 and 1925.

METHODS OF FEEDING

During the summer, the dry cows, the yearlings and other heifers in good condition are kept on pasture lands; no concentrates are given but a supply of salt is available at all times.

The milking cows are also kept on pastures, a supplement of green fodder, clover, o.p.v., is given early in the season as our grazing lands are rather limited for the present needs. A supplement of concentrates is also given, in varying quantity, according to the condition of the pastures, the quantity and test of the milk produced by each cow but never more than one pound of concentrate per four pounds of milk produced.

In the winter time, the roughage ration is made up chiefly of clover hay, and sunflower and o.p.v. silage.

The quantity of hay varies from one to two pounds per hundred pounds of live weight; silage is given at the rate of 2 to 3 pounds per hundred pounds live weight. Concentrates are fed at the rate of one pound per three or four pounds of milk produced; the heaviest proportions are generally fed to the best milkers, to cows giving the richest milk, those having a tendency to lose weight and those still growing, such as milking heifers.

The concentrate or meal mixture always includes at least five kinds of meals; the most commonly used during the year were the following: oats, barley, bran, oil cake and brewers' dried grains.

During the winter, the daily rations for adult cows are given in two meals, morning and night; fresh water is always available and salt is distributed every day; they are also groomed daily.

Cost data are obtained in three ways (1) by recording the quantity of feed consumed by each cow during the period preceding calving while the cows are dry, and also during the full lactation period, the feed consumed being valued at current prices in the locality, in the local trade. (2) By daily weighings of the milk produced by each cow. (3) By means of the Babock test, which is done twice monthly, to ascertain the quantity of butterfat produced by each cow during the month and the total production of butterfat for the entire year.

In figuring the value of the products, no account is taken of the value of the calf or of the manure, as these two items are supposed to cover a large share of the maintenance costs.

Skim-milk is valued at 30 cents per hundredweight and butterfat at 30 cents per pound.

The details of this project, as well as a ten-year average, are given in the following table. The comparison between this average and the production for the current year, shows only a slight increase. This is because the herd included only few cows, all of good quality, during the first few years, and the average production for such a small number was rather high; feed costs were also quite high.

RECORDS OF COWS HAVING COMPLETED THEIR PERIOD OF LACTATION IN 1930

Name of cow	Age at beginning of lactation	Date of calving	Number of days in lactation period	Total production of milk	Average daily production of milk	Per cent of fat	Pounds of fat produced	Value of fat at 30 cents a pound	Value of skim-milk at 30 cents per 100 pounds	Total value of products	Meal at $40.92 per ton	Roots at $2.50 per ton	Hay at $10 per ton	Silage at $5 per ton	Pasture at $1 per month	Total cost of feed	Cost of 100 pounds of milk	Cost of production of 1 pound of fat (skim-milk not included)	Profit on 1 pound of fat (skim-milk not included)	Profit per cow (manual labour and calf not included)
	years		days	lb.	lb.	%	lb.	$	$	$	lb.	lb.	lb.	lb.	mos.	$	$	cts.	cts.	$
Dinette	2·2	5-7-29	340	5,397	15·87	4·2	227·54	68 26	15 51	83 77	1,798	525	2,399	6,940	3	69 79	1 29	30 67	−0·67	13 93
Dora	3·1	29-1-30	297	7,300	24·57	4·09	298·39	89 52	21 00	110 52	1,851	200	2,442	6,383	4	70 29	0 96	23·56	6·44	40 23
Migmonne	6·10	10-3-30	282	8,616	30·55	4·17	359·29	107 79	24 77	132 56	2,281	440	3,775	6,802	4	87 10	1 01	24·24	5·76	45 46
Aorore	4·10	31-1-29	295	6,266	21·24	4·15	260·04	78 01	18 02	96 03	1,714	200	2,830	6,308	4	69 25	1 11	26·63	3·37	26 78
Danienne	2·2	23-7-29	414	7,934	19·16	3·60	285·62	85 69	22 95	108 64	2,470	735	2,639	7,800	6	90 15	1 14	31·56	−1·56	18 49
Lily	10·6	26-10-29	357	8,008	22·65	4·16	336·46	100 94	23 25	124 19	2,222	243	3,192	7,777	6	87 15	1 08	25·90	4·10	37 04
Paulie C	8·7	1-1-30	277	6,771	24·44	4·1	277·61	83 28	19 48	102 76	1,675	30	2,268	6,249	4	65 27	0 96	23·51	6·49	37 49
Primrose of Ottawa	10·1	30-6-29	391	7,379	18·87	4·15	306·23	91 87	21 22	113 09	2,760	735	4,657	12,354	5	116 57	1 58	38·07	8·07	−3 48
Delima	2·8	18-12-28	406	6,506	16·02	4·08	265·44	79 63	18 72	98 35	1,884	525	2,994	8,173	3	77 61	1 19	29·24	0·76	20 74
Cecile	3·5	29-1-29	381	7,551	19·82	4·08	308·08	92 42	21 73	114 15	2,496	630	3,397	9,663	3	96 00	1 27	31·16	−1·16	18 15
Ottawa Valentine	5·5	17-4-29	321	6,760	21·06	4·1	277·16	83 15	19 45	102 60	2,196	670	3,816	10,304	3	93 61	1 38	33·77	−3·77	8 99
Lily de La Ferme	2·1	1-1-30	324	5,386	16·62	4·26	229·64	68 89	15 47	84 36	1,396	200	2,165	5,160	4	56 54	1 05	24·62	5·38	27 82
Primrose of Ottawa 2nd	6·6	1-1-30	284	6,248	22·00	3·98	248·67	74 60	18 00	92 60	1,872	70	2,530	7,329	4	73 37	1 17	29·50	0·50	19 23
Total	67·6	.....	4,369	90,202	.....	.....	3,680·17	1,114 04	259 57	1,363 61	26,615	5,203	39,104	101,242	53	1,052 70	11 67	.....	.....	310 92
Average of 13 cows	5·2	.....	336·0	6,938·6	.....	4·08	283·09	85 70	19 97	104 89	2,047·3	400·2	3,008·0	7,787·8	4·07	80 98	1 17	.....	.....	23 91
Average for 11 years	.....	.....	309·4	6,775·7	.....	3·80	257·73	104 73	18 93	123 60	1,729·4	415·8	2,304·7	7,322·9	3·64	88·37	1 29	.....	.....	76 41

FEED COST OF HEIFERS FROM BIRTH TO FIRST CALVING

Six heifers from slightly under two years to over two years of age, calved for the first time last year. The total amount of feed consumed and the entire cost of feeding these six heifers were carefully recorded, and an average was drawn for a period of ten years during which 49 heifers were under similar observation; the average feed cost per head amounted to $82.34.

In 1930, the average feed cost per heifer was $74.92, showing a reduction of $7.42, due to the lower cost of feed.

A further reduction in the cost of feeding is possible if the clearing of land and the production of fodder keep on increasing, and if the price of hay remains on the same level as at present or lower. However, the cost of feeding will always be high enough to justify the greatest care in the selection of breeding stock, as only animals of good quality can produce enough to show a profit over this cost.

The results of this experiment are given in the following table:—

FEED COST OF HEIFERS—1930

Name of heifer	Age at calving	Whole milk at $1.50 per 100 pounds	Skim-milk at 30 cents per 100 pounds	Meal at $41.13 per ton	Hay at $10 per ton	Greens at $2.50 per ton	Silage at $5 per ton	Roots at $2.50 per ton	Pasture	Total cost of feed
	years	lb.	lb.	lb.	lb.	lb.	lb.	lb.	months	$
Lily de La Ferme	2·1	270	2,673	1,115	2,795	105	5,552	.....	8	70 98
Emilia de La Ferme	2·1	220	2,439	1,069	2,712	140	5,298	.....	8	67 61
Kyle Primrose de Ferme	2·0	427	796	1,370	3,116	.....	5,050	.....	4	69 16
Kyle Daisy de la Ferme	1·1	525	1,746	1,416	3,268	.....	5,490	.....	4	76 29
Supreme Delvine A	2·0	633	3,642	1,295	2,946	.....	4,564	.....	4	77 20
Supreme Fauvette A	2·4	395	2,342	1,545	3,677	.....	6,878	.....	8	88 30
Average	1·95	411·6	2,274·6	1,301·6	3,085·6	122·5	5,472·0	.....	6·0	74 92
10-year average	1·89	317·1	2,290·9	1,296·6	2,630·2	138·2	7,241·4	152·3	5·2	82 34

FEED COST OF THE DAIRY BULL

A careful record was kept during the year of the feed consumed by an adult Ayrshire bull, weighing 1,900 pounds.

The following table shows the quantity of feed consumed and the total cost of feeding this bull during the entire year, as well as the average for the past two years:—

TOTAL COST OF FEED CONSUMED BY AN ADULT DAIRY BULL

Year	Age	Meal at $42.58 per ton	Hay at $10 per ton	Silage at $2.50 per ton	Total cost
	years	lb.	lb.	lb.	$
1929	5·9	2,498·0	3,693·0	6,940·0	80 31
1930	6·9	1,468·0	5,110·0	6,505·0	64 96
2-year average	6·4	1,983·0	4,401·5	6,722·5	72·63

SALES OF BREEDING STOCK

Several registered pure-bred Ayrshire bulls were sold to farmers of the locality as well as grade cows of good quality. This practice greatly helps the farmers to improve their herds.

SWINE

The herd numbers in all 38 registered Yorkshires, all of a good bacon type. The herd is used for an experiment under the "Advanced Registration" plan. Under this plan, the young pigs are fed in such a manner as to develop rapidly and economically into good bacon hogs. A record is kept of growth and thrift of each individual litter, in order to ascertain the best brood sows and breed from the best lines. A record is also kept of the amount of feed required and the cost of production at different stages. The data of this experiment are given in the following tables:—

COST OF REARING HOGS FROM BIRTH UNTIL WEANING AGE, FEED OF THE SOWS INCLUDED

Number of sows		3
Number of living pigs (three litters)		27
Average number of living pigs per litter		9
Feed consumed, consisting of a mixture of bran, ground oats, middlings, shorts, tankage, bone meal, charcoal and salt, 3,472 pounds of mixed meal at $41.12 per ton	$	71 38
2,700 pounds skim-milk at 30 cents per 100 pounds		8 10
Extra manual labour required at farrowing time, $2 per litter		6 00
Interest on capital, $35 per sow for 6 months at 6 per cent		3 15
Cost of rearing 27 pigs at the age of 2 months	$	88 63
Cost of rearing 1 pig at the age of 2 months		3 28
Cost of rearing 1 pig, 9 year average		5 21

Mixture of grain fed to the sows—

100 pounds ground oats.
100 pounds middlings.
100 pounds shorts.
100 pounds bran.
20 pounds tankage.
10 pounds charcoal.
4 pounds salt.
Milk.

COST OF REARING PIGS UP TO AGE OF THREE MONTHS

12 2-month-old pigs at $3.39	$	40 68
Meal mixture, 468 pounds at $43.70 per ton		10 25
Skim-milk, 840 pounds at 30 cents per 100 pounds		2 52
Cost of 12 young pigs at three months of age	$	53 45
Cost of 1 young pig at three months of age		4 45
Average cost of 1 young pig over a 5-year period		6 42

Weight of 12 young pigs at two months of age, 306 pounds.
Weight of 12 young pigs at three months of age, 545 pounds.
Gain in weight, 239 pounds.

Composition of mixture given during sixty days, beginning from date of weaning:—

200 pounds middlings.
100 pounds ground oats.
50 pounds ground barley.
50 pounds shorts.
25 pounds bran.
14 pounds oil cake meal.
14 pounds tankage.
4½ pounds bone meal.
2¼ pounds salt.

Skim-milk is given according to the quantity available.

COST OF REARING PIGS UP TO THE AGE OF SIX MONTHS

2 two-month-old pigs at $4.46	$	8 92
Meal mixture, 533 pounds at $42.96 per ton		11 46
Skim-milk, 1,360 pounds at 30 cents per 100 pounds		4 08
Cost of two pigs at the age of six months	$	24 46
Cost of one pig at the age of six months		12 23
Cost of one pig at the age of six months, 9 year average		14 99

These pigs were fed the same meal mixture from three to five months of age that they received from two to three months of age; the following mixture was given from the fifth to the sixth month:—

150 pounds ground oats.
100 pounds middlings.
100 pounds barley.
50 pounds shorts.
25 pounds bran.
14 pounds oil cake meal.
14 pounds tankage.
4½ pounds bone meal.
2¼ pounds salt.
Skim-milk.

Weight of two young pigs at the age of three months	90 pounds
Weight of two young pigs at the age of six months	310 "
Gain, from third to sixth month	220 "

COST OF PRODUCTION OF HOGS FROM BIRTH TO SLAUGHTERING

Two pigs six months old at $12.23	$	24 46
Meal mixture, 389 pounds at $36.20 per ton		7 04
Skim-milk, 587 pounds at 30 cents per 100 pounds		1 76
Cost of two pigs at slaughtering	$	33 26
Cost of one pig at slaughtering		16 63
Weight of two pigs at age of six months	310 pounds	
Weight of two pigs at slaughtering	437 "	
Gain in weight	127 "	
Cost of production of 100 pounds of pork	$	7 61
Net profit, sale price $13.50 per 100 pounds ($5.89 profit per hundredweight) net total profit on 437 pounds		25 74

These pigs received the same ration given to 5-6 months old pigs.

YEARLY MAINTENANCE COST OF BROOD SOWS

The following ration was fed during a whole year:—

100 pounds ground oats.	20 pounds tankage and bone meal.
100 pounds middlings.	10 pounds charcoal.
100 pounds bran.	4 pounds salt.

Feed consumed by six brood sows:—		
14,481 pounds of meal mixture at $37.74 per ton	$	273 26
5,400 pounds of skim-milk at 30 cents per 100 pounds		16 20
Cost for six sows during 1 year	$	289 46
Cost for one sow during 1 year		48 24
Average for a 4-year period		43 39

MAINTENANCE COST OF ONE BOAR DURING THE YEAR

Same mixture as fed the brood sows.		
2,190 pounds of meal mixture at $37.74 per ton	$	41 33
4-year average		45 20

COST OF THREE SOWS AT MATING TIME

3 sows at the age of six months at $11.93	$	35 79
1,392 pounds of meal mixture at $30.68 per ton		21 35
Cost of three sows at farrowing time	$	57 14
Cost of one sow at farrowing time		19 05
2-year average		19 95

SALES OF BREEDING STOCK

Several registered boars and sows for breeding purposes were sold throughout the district, and a great improvement in the type of hogs raised in this part of the country should result.

SHEEP

Only registered Cheviots are kept on this Station. On December 31, the flock included in all 58 sheep of the true Cheviot type, all in good health and of a good conformation.

In grading up the herd, a great deal of attention is paid to the quality of the wool; great help was received in this connection from the Wool Grower's Co-operative Association, with headquarters at Lennoxville.

All the fleeces are sent to Lennoxville for grading by the Co-operative's experts; the report of this grading is used as a basis for the selection of breeding stock.

Last spring, 34 ewes gave 19 ewe-lambs and 20 ram-lambs, or an average of slightly more than one offspring per ewe (1·14 per ewe). The weight of the fleeces varied from 3½ to 7 pounds, the average weight being 6·2 pounds.

Several rams and ewes were sold to farmers of the district for breeding purposes.

FIELD HUSBANDRY

SEEDING

Conditions were favourable for early seeding on account of the light snowfall during the winter, the warm days and light rainfall of the latter part of April and the first part of May. Our fields being well drained, seeding started on May 6 and as the temperature remained favourable, all the seeding was practically completed on May 25, one month earlier than in the last few years. Another factor was the use for a few days, of a tractor for disking and harrowing which enabled us to perform the work before the arrival of a rainy period, during which it was impossible to sow even green fodder crops in new land.

GROWTH

Germination was fairly rapid and uniform but the growth was delayed by cold weather; on May 29, the thermometer registered 26° F., and on the 30th of the same month 24° F. As the surface of the soil was quite firm, the peas which were sown on May 6, and had reached a height of 3 inches at the time, did not appear to suffer very much from the frost, as their leaves were not destroyed; the same applies to the leaves of cereals, while the leaves of clover, rhubarb and also of ornamental trees, such as birch, poplar and laurel-leafed willow, were greatly damaged. This shows that our crops are quite frost resistant, and that the farmers living in this northern district should always make it a rule to sow very early in the spring as the late spring frosts are far less disastrous, specially for cereals, than the early autumn frosts, usually accompanied by more or less heavy rains.

The cold days of the end of May were followed by warmer days in June but the rainfall was excessive; from June 3 to the end of the month, rain fell during seventeen days and a total of 8·28 inches of water was recorded. The fact that all crops, in addition to hay, escaped complete destruction may be attributed to the well drained condition of the soil.

About July 10, there was an invasion of cutworms and aphids, greatly damaging the vegetables in some localities, and even attacking the potato crop and the young plants in the meadows, but the outbreak came to an end towards the last of the month. Rust caused great harm to wheat, but, as a rule, the crops made a fairly good growth.

HARVESTING

A bumper hay crop was harvested under good conditions, and haying was over by the beginning of August. The harvesting of cereals was started during the last days of August and completed by September 10. Silage yielded a very fair crop, and was harvested from the first days of September up to the last days of October.

COST OF PRODUCTION OF CROPS

Observations were made and data recorded on the cost of production of the different crops under cultivation in this district, in order to advise the farmers as to the most profitable crops to grow. The main items included in the cost of production are the following: rent of the land and taxes, use and depreciation of machinery, cost of seed, manure, manual labour and horse labour, twine, threshing and ensiling. A detailed explanation follows:

Use of Land and Buildings.—This includes the interest, the capital invested in the farm, or the rental of the buildings and farm, as well as the taxes generally levied.

Cost of Manure.—Barnyard manure is valued at $1.50 per ton, which amount represents the value of the average increase in yield produced by the application of one ton of manure, deducting costs of handling, harvesting, etc., over crops grown on unmanured land. The total cost of manure charged to crops varied with the quantity employed, the frequency of the applications and the time of application—whether the manure is applied directly to the crop or to one of the previous crops. Account is taken of the probable percentage of plant food available for the crop, and which varies according to the date of application of the manure. The following table shows the manner of distributing the costs according to the entire rotation:—

Manure—Distribution of Costs

Length of rotation	Year manure was applied	Percentage of manure costs charged to each year of the different rotations
		%
Three-year rotation	1st year	50
	2nd year	30
	3rd year	20
Four-year rotation	1st year	40
	2nd year	30
	3rd year	20
	4th year	10
Five-year rotation	1st year	40
	2nd year	25
	3rd year	20
	4th year	10
	5th year	5
Six-year	1st year	40
	2nd year	25
	3rd year	20
	4th year	10
	5th year	5
	6th year	0

Percentage distribution of chemical fertilizers for each year of the rotation:—

1st year	55 per cent.
2nd year	30 "
3rd year	10 "
4th year	5 "

The percentage of distribution of sodium nitrate or of sulphate of ammonia for each year of the rotation is as follows:—

1st year	80 per cent
2nd year	20 "

Chemical Fertilizers.—The cost of mixed chemical fertilizers is distributed in about the same manner as the cost of manure. For instance, in a four-year rotation, 55 per cent of the costs are charged to the first year crop, 30 per cent to the second year crop, 10 and 5 per cent respectively to the third and fourth year crops.

When only a single fertilizer is used, such as nitrate of soda which is entirely available as soon as applied, 80 per cent of the total cost is charged to the first year crop and 20 per cent to the second year crop.

As regards soil amendments, such as ground limestone, the cost is equally divided and charged to each crop included in the rotation, on account of the slowness with which the limestone becomes available.

MANUAL LABOUR.—This includes the prevailing wages paid to farm labourers in the district, plus the cost of feeding and housing the men. Under the heading "Hours of manual labour", the number of hours of labour required to do the necessary cultural and harvesting operations under ordinary conditions is entered.

HORSE LABOUR.—The cost of horse labour is computed at 10 cents per hour; this is an average figure, arrived at according to the system described in the first part of this report, dealing with the cost of horse labour. It varies with the number of working hours per day and the cost of the feed given.

MACHINERY.—The amount of $2.85 per acre charged to machinery includes the depreciation and interest charges on the machinery usually used on farms in Eastern Canada.

THRESHING.—The charge per bushel is the ordinary amount charged for threshing, the cost of machinery and food for the workers.

ENSILAGE.—The charge per ton includes the cost of harvesting by machinery, ensiling, depreciation and interest charges on the amount invested in the special equipment required for the crop.

The following is a summary of the different items and of their costs; these figures were used as a basis for computing the cost of production of the different crops:—

COST VALUES IN 1930

Rent and taxes per acre	$ 4 30
Manual labour, per hour	0 30
Horse labour, per hour	0 10
Use of machinery, per acre	2 85
Manure, per ton	1 50
Twine, per pound	0 12
Threshing: wheat and rye, per bushel	0 12
barley, per bushel	0 10
oats, per bushel	0 08
Ensiling, per ton	0 70
Seed:—Potato, per bushel	1 00
Wheat, per bushel	1 80
Rye, per bushel	1 75
Barley, per bushel	1 35
Oats, per bushel	1 25
Peas, per bushel	3 00
Corn, per bushel	2 70
Vetch, per pound	0 06
Sunflowers, per pound	0 12
Swedes, per pound	0 50
Mangels, per pound	0 45
Timothy, per pound	0 13
Red clover, per pound	0 25
Alsike clover, per pound	0 22
White clover, per pound	0 45
Sweet clover, per pound	0 09
Alfalfa, per pound	0 52

RETURN VALUES OF CROPS

The value of the different crops, such as potatoes, cereals and hay is based on the prevailing prices in the district. The prices of straw, ensilage and roots are based on the price of hay, as these crops have no commercial value. These prices vary according to the percentage of dry matter and the nutritive value of such crops as compared with hay and the price at which hay sells in the district. The following is a list of the crops produced and the value attributed to each.

CROPS—RETURN VALUES

Potatoes, per bushel	$ 1 10
Wheat, per bushel	1 05
Barley, per bushel	0 60
Oats, per bushel	0 55
Hay, per ton	12 00
Oats and barley straw, per ton	5 00
Wheat and rye straw, per ton	2 50
O.P.V. silage, per ton	4 28
Sunflower silage, per ton	3 42
Corn silage, per ton	3 20
Swedes, per ton	2 00

COST OF PRODUCTION OF HAY

This year, as in 1929, hay produced a heavier crop on the Station than in the surrounding district, where there are too many old meadows which should be renovated. First year hay contained a very large proportion of clover.

The mixture of grasses and the quantity of seed used in the establishment of meadows are the following: timothy, 10 pounds; red clover, 8 pounds; alsike clover, 4 pounds. The total cost of the seed is divided by the number of years the land is in meadow, and charged equally to each year for the timothy; as regards the clovers, the entire cost of the seed is charged to the first year hay crop. The amount charged for manure represents the average share of the third and fourth years of a quantity of 16 tons, applied to a four-year rotation.

Of all fodder crops grown in 1930, hay has again been the most profitable for it returned the biggest profit and its cost per feed unit is also the lowest of all; it deserves therefore a great deal of attention from the farmers of the district. As clover predominates in all the meadows, the soil is greatly benefited thereby, and the hay is an excellent feed, eminently suitable for milch cows. The following table gives the results obtained in 1930 as well as a five-year average.

HAY—COST OF PRODUCTION PER ACRE

Item		1930	Five-year average
Rent and taxes	$	4 50	4 50
Manure	$	3 60	3 36
Seed	$	2 10	2 22
Use of machinery	$	2 85	2 85
Manual labour	$	1 54	3 26
Horse labour	$	0 70	1 24
Total cost per acre	$	15 29	17 43
Yield per acre	tons	2·23	1·83
Total value per acre	$	26 76	28 98
Profit per acre	$	11 47	11 55
Cost of production per ton	$	6 85	9 52

COST OF PRODUCTION OF O.P.V.

This mixture still gives satisfactory yields and is one of the most important crops of the district; it is an excellent feed for milch cows and young cattle. Next to the hay crop, it produces the largest quantity of dry matter and protein per acre. At the La Ferme Experimental Station, it is considered the main source of succulent fodder, to be consumed as green fodder or silage; it may also be made into dry hay of good quality.

Best results are obtained from this crop when it is grown on newly broken land, and during the first year of the rotation, when the manure is generally applied. The value of this crop is computed according to the percentage of dry matter which it contains and the price of hay. Owing to the heavy rainfall in June, it did not yield as heavily as usual. For the 1930 crop, 280 pounds were

equivalent to 100 pounds of hay and as hay was worth $12 per ton, O.P.V. fodder was valued at $4.28 per ton. The amount charged for manure is the first year share of a quantity of 16 tons applied to a four-year rotation. The quantity of seed used was the following: oats, 2 bushels; peas, 3 pecks, and vetches, 1 peck. The cost of production of one acre of O.P.V. fodder is shown in the following table:—

O.P.V. Fodder—Cost of Production per Acre

Item		1930	Five-year average
Rent and taxes	$	4 50	4 50
Manure	$	9 60	11 92
Seed	$	8 65	6 46
Use of machinery	$	2 85	2 85
Manual labour	$	4 89	5 12
Horse labour	$	3 24	2 80
Total cost per acre	$	23 72	33 65
Yield per acre	tons	2·74	4·93
Total value per acre	$	11 72	24 62
Loss or profit per acre	$	−12 01	−9 03
Cost of production per ton	$	12 31	6 82

COST OF PRODUCTION OF SUNFLOWERS

Sunflowers gave a fair yield; they were sown on ridges in rows, 35 inches apart, and suffered little from the excessive moisture on account of the method of culture. This crop gave a yield of 10·41 tons on a four-acre area. Its value is computed in the same manner as that of the O.P.V. fodder, according to the price of hay and the dry matter content of sunflowers; as the percentage of dry matter in sunflowers is less than that in the O.P.V. mixture, it has accordingly a lower value, i.e., $3.42 per ton. The following table contains all details concerning the production of this crop:—

Sunflowers—Cost of Production per Acre

Item		1930	Five-year average
Rent and taxes	$	4 50	4 50
Manure	$	9 60	11 52
Seed	$	1 32	1 18
Use of machinery	$	2 85	2 85
Manual labour	$	7 95	11 46
Horse labour	$	4 02	3 70
Total cost per acre	$	30 24	35 21
Yield per acre	tons	10·41	4·31
Total value per acre	$	35 60	16 38
Profit or loss per acre	$	5 36	−18 83
Cost of production per ton	1	2 92	8 17

COST OF PRODUCTION OF SPRING WHEAT

Wheat gave a slightly higher yield than in 1929, which would have been still higher, however, had it not been for the excessive precipitation and the presence of rust, which caused rather considerable damages.

The amount charged against the crop for manure is the second year share of a quantity of 16 tons, and that of the fifth year of an 8-ton application to

a six-year rotation, plus the share of an application of 2 tons of ground limestone. The results obtained are as follows:—

WHEAT—COST OF PRODUCTION PER ACRE

Item		1930	Five-year average
Rent and taxes	$	4 50	4 50
Manure and limestone	$	7·95	9 74
Seed	$	3 60	3 49
Use of machinery	$	2 85	2 85
Manual labour	$	4 38	4 17
Horse labour	$	2 74	2 64
Twine	$	0 30	0 29
Threshing	$	1 51	1 45
Cost per acre	$	27 53	28 84
Yield (grain)	bush.	15·1	13·9
Yield (straw)	ton	0·67	0·67
Value per acre (grain)	$	15 95	16 93
Value per acre (straw)	$	1 67	2 16
Total value	$	17 52	19 05
Loss per acre	$	10 01	9 79
Cost of production per bushel, value of straw deducted from total cost	$	1 71	1 92

COST OF PRODUCTION OF BARLEY

Although barley is the most susceptible of all crops to adverse climatic conditions, it has shown a fair degree of resistance in rather poor conditions. As in the past years, it took a yellowish tinge when about to head.

The amount charged for manure represents the second year share of a quantity of 16 tons per acre, applied to a four-year rotation. The results obtained during the past season as well as a five-year average, are shown in the following table:—

BARLEY—COST OF PRODUCTION PER ACRE

Item		1930	Five-year average
Rent and taxes	$	4 50	4 50
Manure	$	7 20	8 64
Seed	$	3 37	4 44
Use of machinery	$	2 85	2 85
Manual labour	$	4 56	4 90
Horse labour	$	2 74	3 15
Twine	$	0 36	0 31
Threshing	$	1 68	1 37
Total cost per acre	$	27 26	30 16
Yield per acre (grain)	bush.	16·8	13·8
Yield per acre (straw)	tons	0·84	0·73
Value per acre (grain)	$	10 08	12 90
Value per acre (straw)	$	4 20	4 27
Total value	$	14 28	17 17
Loss per acre	$	12 98	12 99
Cost of production per bushel, value of the straw deducted from total cost		1 37	1 91

COST OF PRODUCTION OF OATS

On an average, the oat crop was proportionately lower than that of barley or of wheat. The amount charged for manure represents the second year share of a quantity of 16 tons per acre, applied to a four-year rotation. The results for the past season as well as the average for a five-year period are shown in the following table:—

OATS—COST OD PRODUCTION PER ACRE

Item		1930	Five-year average
Rent and taxes	$	4 50	4 50
Manure	$	7 20	8 64
Seed	$	3 75	4 11
Use of machinery	$	2 85	2 85
Manual labour	$	4 50	4 12
Horse labour	$	2 86	3 48
Twine	$	0 36	0 34
Threshing	$	1 28	1 73
Total cost per acre	$	27 30	38 77
Yield per acre (grain)	bush.	16·0	22·8
Yield per acre (straw)	tons	1·36	0·88
Value per acre (grain)	$	8 80	16 34
Value per acre (straw)	$	6 80	5 10
Total value per acre	$	15 60	21 44
Loss per acre	$	11 77	7 33
Cost of production per bushel, value of straw deducted from total cost	$	1 28	1 07

COST OF PRODUCTION OF POTATOES

Potatoes are one of the most profitable crops in this section, as they command a good price. Great quantities are imported yearly as local production is far from meeting the demand.

The amount charged for manure is equivalent to the share of a quantity of 16 tons per acre, applied to a five-year rotation.

The following results were obtained:—

POTATOES—COST OF PRODUCTION PER ACRE

Item		1930	Five-year average
Rent and taxes	$	4 50	*4 50
Manure and limestone	$	10 22	15 99
Seed	$	20 00	25 68
Use of machinery	$	2 85	2 85
Manual labour	$	25 15	35 26
Horse labour	$	6 35	5 44
Total cost per acre	$	69 07	89 72
Yield per acre	bush.	159·0	118·0
Total value per acre	$	174 90	147 90
Profit per acre	$	105 83	58 21
Cost of production per bushel	$	0 39	0 72

SILAGE CROPS VERSUS ROOTS

The object of this experiment is to ascertain the best succulent feeds for cattle. A four-year rotation was established for the purpose as follows: first year, hoed crop; second year, oats; third year, clover hay; fourth year, timothy hay.

The comparison is made the first year of the rotation; the land is ploughed in the fall and manured at the rate of 16 tons per acre.

The following crops are under test: mangels, swedes, sunflowers, corn, O.P.V. mixture—2 bushel oats, 3 pecks peas and 1 peck vetches.

The various crops were sown when the temperature appeared to be most suitable for each. The results obtained are as follows:—

SILAGE CROPS VS. ROOTS

—	O.P.V.		Sunflowers		Corn		Swedes		Mangels	
	1930	Nine-year average	1930	Nine-year average	1930	Nine-year average	1930	Nine-year average	1930	Nine-year average
Yield in green weight per acre..... tons	3·98	4·83	10·22	3·60	0·80	0·45	2·88	1·76	1·25	0·76
Yield in dry matter per acre..... lb.	2,300	2,480	3,345	1,665	158	135	1,082	625	310	.....
Total cost per acre.... $	39 58	35 97	36 57	38 18	32 34	36 52	37 22	46 95	40 32	47 83
Total value per acre.... $	17 03	27 69	42 84	20 01	2 56	2 67	5 76	5 09	2 50	2 20
Profit or loss per acre $	22 55	−8 28	6 27	−18 17	−29 78	−33 85	−31 46	−41 86	−37 82	−45 62
Cost of production of 1 ton green weight.... $	9 94	7 44	3 57	10 60	40 40	81 15	12 92	26 10	35 25	62 93
Cost of production of 100 pounds dry matter..... $	1 72	1 45	1 09	2 29	20 46	27 05	3 44	7 51	13 00	.....

NOTE.—The above yield in dry matter is only a three year average.

SURFACE DRAINAGE EXPERIMENT

The object of this experiment is to determine the effect of the width of lands on the yield of crops. It is conducted on a clay soil, containing a good percentage of humus, and underlaid by a heavy, compact clay sub-soil. A four-year rotation is followed in this experiment, as follows:—

First year—Oats.
Second year—Barley.
Third year—Clover hay.
Fourth year—Timothy hay.

A quantity of 16 tons per acre is applied to the first year crop. Each field forming part of the rotation is divided into two sections, one of which includes three narrow lands 16·5 feet wide, and the other one land 49·5 feet wide. The results obtained are as follows:—

RESULTS OF SURFACE DRAINAGE EXPERIMENT

Year of rotation	Crop	Yield per acre			
		1930		Four-year average	
		Narrow lands	Wide lands	Narrow lands	Wide lands
1	Oats: grain..... bush.	14·6	16·2	23·0	26·2
	straw..... tons	0·98	1·04	0·69	0·80
2	Barley: grain..... bush.	11·2	16·8	9·6	12·2
	straw..... tons	0·72	0·84	0·49	0·57
3	Clover hay..... tons	2·14	2·20	2·04	1·87
4	Timothy hay ..... tons	1·76	2·30	1·91	2·00

ROTATIONS

The work on rotations, started in 1923, was continued this year; it comprises in all five rotations which seem to be fairly suitable for the farms of this district, where the future holds great promise for the dairying industry.

Experiments of this nature should show which is the best series of crops for this northern district of the province, what crops yield the most and are best suited for feeding milch cows, while, at the same time, maintaining and improving soil fertility.

After the land has been cleared and provision for drainage made, there is nothing more important for the farmer than to follow a good rotation, capable of maintaining soil fertility and giving heavy yield of crops. The rotations under test since 1923 and the results obtained are as follows:—

ROTATION "A"—THREE YEARS

First year—Sunflowers.
Second year—Oats.
Third year—Clover hay.

This rotation may not be suitable for all farmers. It might prove useful for a farmer who has only a small acreage of cleared land and a great deal of pasture land, or on the other hand for dairy farmers living in proximity to a city and who must practise an intensive system of farming. In some cases, O.P.V. or a crop of vegetables or potatoes might be substituted for the sunflower crop.

Twelve tons of barnyard manure are applied to the first year of the rotation. Since 1929, two tons of ground limestone have been applied the second year of the rotation, as a soil amendment. In this rotation, one-third of the acreage is always in sunflowers, one-third in oats and the last third in hay. The following mixture of grasses is used for the establishment of meadows: timothy 10 pounds, red clover 8 pounds, alsike clover 4 pounds. The following table shows the results obtained:—

ROTATION "A"—THREE YEARS

Year of rotation	Crop	Yield per acre		Value of crop, 1930	Cost of production of crop,	Profit or loss per acre	
		1930	Eight-year average			1930	Eight-year average
				$	$	$	$
1	Sunflowers..... tons	7·06	3·09	24 14	40 56	−16 42	−27 22
2	Oats..... bush.	17·9	20·8 (5 years)	12 94	28 52	−15 58	−10 21
3	Clover hay..... ton	1·22	1·16	14 64	19 96	− 5 32	− 2 24
	Total.....	.....	.....	51 72	89 04	−37 32	−39 67
	Average per acre.....	.....	.....	17 24	29 68	−12 44	−13 22

ROTATION "B"—FOUR YEARS

First year—O.P.V.
Second year—Oats.
Third year—Clover.
Fourth year—Timothy hay.

This rotation is fairly well adapted to the average conditions of the farms of the district having a fair proportion of cleared land. In this rotation, part of the O.P.V. mixture could be replaced by a crop of vegetables or of potatoes.

Half the land is now in hay, one-quarter is sown to oats and one-quarter to O.P.V. It was only as late as 1929 that the O.P.V. mixture was substituted for sunflowers, because the latter's yield was not profitable.

A quantity of 16 tons of manure is applied the first year of the rotation; two tons of limestone are also applied to the oat crop, as a soil amendment. The mixture of grasses used for the establishment of the meadow is identically the same as that described for the three-year rotation.

The results obtained are as follows:—

ROTATION B—FOUR YEARS

Rotation year	Crop	Yield per acre		Value of crop 1930	Cost of pruduction, 1930	Profit or loss per acre	
		1930	Eight-year average			1930	Eight-year average
				$	$	$	$
1	Sunflowers (6 years)....tons	.....	2·43	.....	.....	.....	26 81
	O.P.V. (2 years).....tons	2·41	2·40	10 31	38 02	−27 71	24 28
2	Oats.....bush	18·5	23·2	11 92	29 79	−17 87	−10 34
3	Clover hay.....tons	1·05	1·37	12 60	19 85	−7 25	1 10
4	Timothy hay.....tons	1·16	1·00	13 92	15 28	−1 36	−0 39
	Total.....	.....	.....	48 75	102 94	−54 19	−41 46
	Average per acre.....	.....	.....	12 19	25 73	−13 55	−10 36

ROTATION " C "—FIVE YEARS

First year—O.P.V.
Second year—Barley.
Third year—Clover hay.
Fourth year—Timothy hay.
Fifth year—Oats.

This five-year rotation produces a larger quantity of cereals; it is specially suitable for farms where the latter grow well and on others where dairying is practised, in conjunction with swine breeding for the production of bacon, which requires a good supply of barley.

In this rotation, one-fifth of the acreage is in O.P.V. (prior to 1929, this field was in sunflowers, but the latter crop has since been replaced by O.P.V., on account of its better yield).

During the five years of the rotation a total of 20 tons of manure is applied in the following manner: 12 tons to the first year crop of O.P.V. and 8 tons to the fourth year crop of timothy. A first application of 2 tons of limestone was made in 1929 to the second year crop of barley. The mixture of grasses seeded with barley for the establishment of the meadow is the same as mentioned in the previous rotations.

The results obtained are shown in the following table:—

ROTATION "C"—FIVE YEARS

Rotation year	Crop	Yield per acre		Value of crop, 1930	Cost of production, 1930	Profit or loss per acre	
		1930	Eight-year average			1930	Eight-year average
				$	$	$	$
1	Sunflowers (6 years)....tons	.....	2·20	.....	.....	.....	−29 65
	O.P.V. (1 year).....tons	1·83	2·55	7 82	36 21	−28 39	−18 06
2	Barley.....bush	19·2	13·7	19 52	27 35	− 7 83	−14 48
3	Clover hay.....tons	1·30	1·33	15 60	18 65	− 3 05	2 86
4	Timothy hay.....tons	2·50	1·58	30 00	19 96	10 04	5 47
5	Oats.....bush.	20·0	26·8	13 80	26 52	−12 72	−8 65
	Total.....	.....	.....	86 74	128 69	−41 95	−62 51
	Average per acre.....	.....	.....	17 23	25 74	−8 39	−10 42

ROTATION " D "—SIX YEARS

First year—Potatoes.
Second year—Wheat.
Third year—Barley.
Fourth year—Clover hay.
Fifth year—Timothy hay.
Sixth year—Timothy hay.

This is the most profitable of all rotations tried on this Station, on account of the potato crop, which commands a very high price in this part of the country, and also on account of the three years in hay, a crop with a low cost of production and a fairly high annual yield.

Twenty-four tons of manure are applied to this rotation: 16 tons to the crop of potatoes, in the first year, and 8 tons to the crop of clover, in the fourth year.

Since 1929, 2 tons of ground limestone have been applied for the crop of barley, each year. The same mixture of grasses as in the five-year rotation is seeded with barley for the establishment of the meadow. The results obtained are as follows:—

ROTATION "D"—SIX YEARS

Rotation year	Crop	Yield per acre		Value of crop, 1930	Cost of production, 1930	Profit or loss per acre	
		1930	Eight-year average			1930	Eight-year average
				$	$	$	$
1	Potatoes.....bush.	80·4	87·4	88 44	64 50	23 94	18 84
2	Wheat.....bush.	15·1	13·7	17 52	27 83	−10 31	−13 52
3	Barley.....bush.	13·6	10·8	13 36	25 89	−12 53	−16 04
4	Clover hay.....tons	2·32	1·61	27 84	21 99	5 85	0 56
5	Timothy hay.....tons	2·17	1·53	26 04	16 93	9 11	6 54
6	Timothy hay.....tons	1·07	1·22	12 84	14 48	−1 64	4 25
	Total.....	.....	.....	186 04	171 62	14 42	0 63
	Average per acre.....	.....	.....	31 01	28 60	2 40	0 10

ROTATION " E "—FIVE YEARS

First year—Half fallow followed by wheat and fall rye.
Second year—Half the land is sown to fall wheat and the other half to fall rye.
Third year—Clover hay.
Fourth year—Timothy hay.
Fifth year—Oats.

This rotation includes fall wheat and rye. During the fifth year, 8 pounds of red clover are seeded down with the oats and the following year, when this clover has reached a fair height, it is ploughed under and the land is kept under a short summer-fallow until it is seeded to fall wheat and rye.

It will be interesting to ascertain if the increased yield of the other crops compensates for the cost of the fallow and the loss of the second year crop.

Sixteen tons of manure were applied to this rotation: 8 tons to the fallow in the first year and 8 tons to timothy, in the fourth year. Two tons of ground limestone were also applied to the fall cereals, since the spring of 1929.

The mixture of grasses used for the establishment of the meadow is the same as mentioned in the preceding rotations.

The following tables show the results obtained:—

ROTATION "E" (Five years)—FALL WHEAT

Rotation year	Crop	Yield per acre		Value of crop	Cost of production, 1930	Profit or loss per acre	
		1930	Six-year average			1930	Six-year average
				$	$	$	$
1	Summer fallow				18 11	−18 11	−16 71
2	Fall wheat....bush.	10·2	5·9	14 06	26 85	−12 79	− 8 67
3	Clover hay....tons	1·87	1·48	22 44	17 63	4 81	0 35
4	Timothy hay....tons	2·25	1·67	27 00	19 42	7 58	2 28
5	Oats (5 years)....bush.	13·1 5 years	17·6	9 65	25 26	−15 61	−13 76
	Total			73 15	107 27	−34 12	−36 51
	Average			14 63	21 45	−6 82	−7 30

ROTATION "E" (Five years)—FALL RYE

Rotation year	Crop	Yield per acre		Value of crop 1930	Cost of production, 1930	Profit or loss per acre	
		1930	Six-year average			1930	Six-year average
				$	$	$	$
1	Summer fallow		4 years		18 11	−18 11	−16 71
2	Fall rye....bush.	8·8	7·5	12 85	26 64	−13 79	−13 67
3	Clover hay....tons	1·87	1·48	22 44	17 63	4 81	0 35
4	Timothy hay....tons	2·25	1·67	27 00	19 42	7 58	2 28
5	Oats....bush.	13·1	17·6 5 years	9 65	25 26	−15 61	−13 76
	Total			71 94	107 06	−35 12	−51 51
	Average per acre			14 39	21 41	−7 02	−10 30

EXPERIMENTS ON FERTILIZATION AND SOIL AMENDMENTS

Field experiments were conducted on the fertilization and amendment of the soil through the use of green manure, farm manure alone, farm manure and lime and chemical fertilizers alone. All these experiments are compared to a check plot receiving no fertilizer. They are carried on a fairly uniform soil; each plot measures one acre; on all plots, a four-year rotation is practised—two in cereals and two in hay. The oats were sown on May 8 and barley on May 13. The soil was in good condition but the yields obtained were very poor; the crop made a very poor growth on account of the cold and rainy weather which followed germination.

These experiments have been under way for eight years now and all the results obtained during this period have been recorded. These results are not conclusive as yet, but they show that the use of green manure alone and of summer-fallow is a very slow and tedious way to improve the soils of the Abitibi; on the other hand, farm manure, chemical fertilizers and limestone have been beneficial. The following is a description of each experiment, the results obtained therefrom during the year and an eight-year average:—

EXPERIMENT WITH GREEN MANURE AND SUMMER FALLOW (CLOVER PLOUGHED UNDER FOLLOWED BY A SUMMER FALLOW)

The object of this experiment is to determine the value of green manure and of summer fallow. A five-year rotation is followed.

First year—Oats.
Second year—Summer fallow.
Third year—Barley.
Fourth year—Clover.
Fifth year—Timothy.

Each field covers two acres. Eight pounds of red clover seed and six of alsike clover are sown with the oats the first year; the second year, the young growth of clover from this seeding is ploughed under when in flower. The field is then divided into two equal parts measuring one acre each; acre No. 1 is fallowed, after the clover has been ploughed under; acre No. 2 is again seeded to a mixture of 1 bushel of peas and 2 bushels of oats. When this second crop has reached a good growth, it is ploughed under in the fall.

This rotation is compared to another one not receiving fertilizers of any kind. The results obtained with green manure are given in the following tables:—

RESULTS OF EXPERIMENT WITH CLOVER PLOUGHED UNDER FOLLOWED BY A SUMMER FALLOW

Rotation year	Crop	Yield in hay and straw		Yield in grain		Cost of summer fallow		Value of the crop, cost of summer fallow and green manure deducted	
		1930	Eight-year average	1930	Eight-year average	1930	Eight-year average	1930	Eight-year average
		ton	ton	bush.	bush.	$	$	$	$
1	Oats	0·64	0·94	11·7	21·6	3 47	3 66	6 16	19 43
2	Clover ploughed under followed by a summer fallow								
3	Barley	0·61	0·48	10·5	9·1	3 47	4 82	5 35	5 33
4	Clover hay	1·12	1·70			3 47	6 92	9 97	14 35
5	Timothy hay	0·73	1·36			3 47	6 70	5 29	16 59
	Total					13 88	22 10	26 77	55 60
	Average per acre					2 77	4 42	5 35	11 12

RESULTS OF EXPERIMENT WITH CLOVER PLOUGHED UNDER FOLLOWED BY A CROP OF PEAS AND OATS PLOUGHED UNDER IN THE FALL

Rotation year	Crop	Yield of hay and straw		Yield of grain		Cost of green manure		Value of crop, cost of green manured deducted	
		1930	Eight-year average	1930	Eight-year average	1930	Eight-year average	1930	Eight-year average
		ton	ton	bush.	bush.	$	$	$	$
1	Oats	0·61	0·88	11·1	18·1	5 92	5 90	3 23	15 98
2	Clover ploughed under followed by a crop of peas and oats ploughed under in the fall								
3	Barley	0·49	0·49	10·2	9·3	5 92	10 47	2 65	5 12
4	Clover	0 72	1·53			5 92	7 12	2 72	13 26
5	Timothy	0·94	1·59			5 92	5 90	5 36	18 70
	Total					23 68	29 39	13 96	53 06
	Average per acre					4 74	5 88	2 79	10 61

EXPERIMENT WITHOUT FERTILIZERS (CHECK PLOT)

This experiment is used as a check for the previous ones; a four-year rotation is practised.

First year—Oats.
Second year—Barley.
Third year—Clover.
Fourth year—Timothy.

Each plot measures one acre; the following results were obtained:—

RESULTS OF EXPERIMENT WITHOUT FERTILIZERS

Rotation year	Crop	Yield of hay and straw		Yield of grain		Value of crop	
		1930	Eight-year average	1930	Eight-year average	1930	Eight-year average
		ton	ton	bush.	bush.	$	$
1	Oats	0·56	0·70	18·5	22·3	17 97	17 82
2	Barley	0·53	0·40	8·9	6·8	7 99	7 64
3	Clover hay	1·49	1·48	.....	.....	17 88	22 72
4	Timothy hay	1·50	1·50	.....	.....	18 00	22 49
	Total	.....	.....	.....	.....	61 84	70 67
	Average per acre	.....	.....	.....	.....	15 46	17 67

EXPERIMENT WITH BARNYARD MANURE ONLY

The same rotation is followed as in previous experiment, with the exception that 16 tons of manure are applied to the first year of the rotation, which is in oats. The results obtained are as follows:—

RESULTS OF EXPERIMENT WITH BARNYARD MANURE ALONE

Rotation year	Crop	Yield of straw and hay		Yield of grain		Cost of manure		Value of crop, cost of manure deducted	
		1930	Eight-year average	1930	Eight-year average	1930	Eight year average	1930	Eight-year average
		ton	ton	bush.	bush.	$	$	$	$
1	Oats	1·05	0·95	16·2	26·8	9 60	8 71	4 56	13 36
2	Barley	1·27	0·78	10·4	10·9	7 20	8 37	5 39	6 55
3	Clover hay	2·05	1·74	.....	.....	4 80	5 59	19 80	19 63
4	Timothy hay	1·87	1·64	.....	.....	2 40	2 79	20 04	20 81
	Total	.....	.....	.....	.....	24 00	25 46	49 79	60 35
	Average per acre	.....	.....	.....	.....	6 00	6 36	12 45	15 08

EXPERIMENT WITH CHEMICAL FERTILIZERS ALONE

The object of this experiment is to ascertain the fertilizing value of sodium nitrate and superphosphate; the rotation followed is similar to the previous one. The fertilizer is applied as follows: 100 pounds sodium nitrate to the second year crop of the rotation, barley, shortly after emergence; in addition, 100 pounds of sodium nitrate and 300 pounds superphosphate are applied to the fourth year of the rotation which is in timothy. The following results were obtained:—

RESULTS OF EXPERIMENT WITH CHEMICAL FERTILIZER ALONE

Rotation year	Crop	Yield of hay and straw		Yield of grain		Cost of chemical fertilizer		Value of crop, cost of chemical fertilizer and limo deducted	
		1930	Eight-year average	1930	Eight-year average	1930	Eight-year average	1930	Eight-year average
		ton	ton	bush.	bush.	$	$	$	$
1	Oats	0·76	0·91	12·6	24·9	1 65	2 72	9 08	16 76
2	Barley	1·09	0·75	12·7	11·3	2 75	4 33	10 32	8 14
3	Clover hay	1·92	1·78	.....	.....	0 83	0 98	22 21	23 26
4	Timothy hay	1·99	1·87	.....	.....	3 02	5 27	20 86	21 30
	Total	.....	.....	.....	.....	8 25	13 30	62 47	69 46
	Average per acre	.....	.....	.....	.....	2 06	3 32	15 62	17 36

EXPERIMENT WITH FARM MANURE AND LIMESTONE

This rotation resembles the previous ones; an application of 16 tons of manure is made to the oat crop and in addition two tons of ground limestone are applied to the barley crop. The following results were obtained:—

RESULTS OF EXPERIMENT WITH FARM MANURE AND LIMESTONE

Rotation year	Crop	Yield of hay and straw		Yield of grain		Cost of the barnyard manure and limestone		Value of the crop, cost of barnyard manure and limestone deducted	
		1930	Eight-year average	1930	Eight-year average	1930	Eight-year average	1930	Eight-year average
		ton	ton	bush.	bush.	$	$	$	$
1	Oats	0·94	0·87	16·6	25·7	11 63	13 38	2 21	10 25
2	Barley	1·07	0·78	14·8	11·5	9 23	10 59	5 03	7 93
3	Clover hay	2·20	1·92	.....	.....	6 82	7 78	19 58	21 46
4	Timothy hay	2·02	1·52	.....	.....	4 42	9 83	19 82	18 82
	Total	.....	.....	.....	.....	32 10	41 58	46 64	58 46
	Average per acre	.....	.....	.....	.....	8 02	10 39	11 66	14 61

HORTICULTURE

The weather was not very favourable for the growing of vegetables in 1930, on account of excessive rains at the beginning of the season as well as cool weather which greatly checked the growth.

Seeding was done earlier than in 1929; germination was very slow on account of the heavy rains and cool weather. Snowfalls and heavy frosts were recorded even after seeding.

When transplanted into the open, the plants made a very slow recovery; a great number perished owing to the excessive humidity of the ground. Many of those that recovered remained weak and had a very poor appearance during the larger part of the season.

The growing of seedlings in hotbeds was greatly handicapped by wet and cold weather which favoured the development of rot; thinning had to be resorted to, as ventilation was too risky under such conditions. A great number of the plants were slightly infected by rot when transplanted, a fact which however did not check their development, for those which did not suffer much from excessive humidity made a very good recovery and developed fairly rapidly afterwards.

The weather was more favourable during the fall, the first frosts coming later than in 1929; there was a slight frost on September 10 which only touched a few vegetables; the first severe frost was recorded on October 3, which laid low all the flowers that had resisted that of September 10.

SOIL IMPROVEMENT

In the fall of 1929, a piece of land was ploughed to a depth of 9 inches, and again ploughed later to a depth of 14 inches, by means of a sub-soil plough. This deeper ploughing, which greatly improved the absorption capacity of the soil while at the same time facilitating drainage, was repeated in the fall of 1930. After the first deep ploughing a great improvement in draining was noticed; the moss and sorrels disappeared and the surface of the soil was in better condition after rainfalls in 1930 than during the previous year.

Several kinds of vegetable were under test again this year; good results were obtained in the majority of cases, especially as regards root vegetables and leaf vegetables.

VEGETABLES

PEAS—VARIETY TEST

Seeding was done on May 12, in 30-foot rows, 36 inches apart, with the plants one inch apart in the rows. Fifteen varieties were under test. The results obtained are as follows:—

PEAS—RESULTS OF VARIETY TEST

Variety	Source	Days from seeding until ready for use	Yield per 30-foot row	Yield per acre	Four-year average
			lb.	lb.	lb.
Lincoln	Invermere	78	10·3	4,985·2	16·0
Director	Invermere	74	8·5	4,114·0	17·5
English Wonder	F.E.C.	73	8·3	4,017·0	.....
Gradus x English Wonder	F.E.C.	68	6·5	3,146·0	.....
Kootenay	Invermere	78	6·5	3,146·0	.....
Stratagem	McDonald	73	6·0	2,904·0	.....
No. 42	Ott. 5410	77	4·7	2,274·8	.....
No. 6	Invermere	73	4·3	2,081·2	15·2
American Wonder	McDonald	68	3·7	1,790·8	.....
Bruce	Invermere	81	3·5	1,694·0	11·5
Gradus	Rennie	66	3·0	1,452·0	8·8
Fenland Wonder	Elsom	66	2·3	1,113·2	.....
World Record	Rennie	66	2·0	968·0	.....
Thomas Laxton	McDonald	67	1·5	726·0	7·8
Laxtonian	Graham	66	1·3	629·2	7·8

Peas suffered greatly from the excessive rainfall during the beginning of the season, resulting in a greatly decreased yield, as a large number of seedlings were destroyed shortly after germination.

PEAS—PLANTINGS AT DIFFERENT DATES

The first sowing was done as soon as the soil was ready and the others at one week intervals up to June 17. Thomas Laxton was the variety used in this experiment. The results obtained are shown in the following table:—

PEAS—RESULTS FROM DIFFERENT DATES OF SOWING

Sowing	Date	Ready for use	Yield per 30-foot row
			lb.
1st sowing	May 13	July 17	5·0
2nd "	" 20	" 17	6·5
3rd "	" 27	" 25	6·3
4th "	June 3	" 27	6·3
5th "	" 10	Aug. 5	5·3
6th "	" 17	" 15	10·5

The last sowing yielded much more than any of the others, because it suffered less from the excess of moisture.

PEAS—SOWING AT DIFFERENT DISTANCES

The five following varieties were used in this experiment: English Wonder, Thomas Laxton, Stratagem, American Wonder and Six Weeks. The results obtained are as follows:—

PEAS—RESULTS FROM SOWING AT DIFFERENT DISTANCES IN THE ROW

Variety	Date of sowing	Date ready for use	Yield per 30-foot row		
			1 inch	2 inches	3 inches
			lb.	lb.	lb.
English Wonder	May 13	July 23	8·8	9·3	10·3
Thomas Laxton	" 13	" 18	7·4	5·8	7·6
Stratagem	" 13	" 29	8·5	10·0	7·5
American Wonder	" 13	" 17	10·0	7·3	7·0
Six Weeks	" 13	" 16	6·1	7·0	4·3

BEANS—VARIETY TEST

Twelve varieties were sown on June 2 in 30-foot rows, 30 inches apart, the plants being 2 inches apart in the rows. The following results were obtained:—

BEANS—RESULTS OF VARIETY TEST

Variety	Origin	Days from sowing until ready for use	Yield per 30-foot row	Three-year average	Remarks
			lb.	lb.	
White Pole No. 1	C.E.F.	73	10·3	.....	Good growth.
Princess of Artois	"	65	9·8	7·6	"
Stringless Green Pod	"	67	8·3	6·3	"
Interloper Challenge B. Wax	"	64	8·0	7·9	Medium growth.
Langport Wonder	Kelway	71	7·8	.....	"
Yellow Pod Bountiful	Schell	66	7·8	6·8	"
Giant Stringless Green Pod	Burpee	68	7·3	4·8	"
Masterpiece	Harrow	67	6·3	5·2	"
Plentiful	Sutton	65	6·3	6·8	"
Davis Wax	McDonald	66	5·3	4·3	Poor growth.
Bountiful	Will	67	5·0	5·3	"
Wardwell Kidney Wax	Graham	65	2·3	2·4	Poor germination.

Nearly all varieties of beans made a poor germination on account of excessive rainfall. The variety White Pole No. 1 did not appear to suffer as much from this condition as the others; made a more rapid development and gave a fairly good yield.

BROAD BEANS—VARIETY TEST

Seven varieties were sown on June 2 in thirty-foot rows, 30 inches apart, the plants being 4 inches apart in the rows. The results obtained are as follows:—

BROAD BEANS—RESULTS OF VARIETY TEST

Variety	Origin	Days from seeding until ready for use	Yield per 30-foot row	Yield per acre	Five-year average
			lb.	lb.	lb.
Broad Windsor	S.B.	77	41·0	23,780·0	18·9
Hangdown	Sharpe	84	36·3	20,880·9	18·9
Lg. Pd. Green	"	75	35·5	20,590·0	13·9
Conqueror	"	81	32·5	18,850·0	14·5
Aquadulce	"	75	29·5	17,110·0	15·7
Mazagan	Sutton	123	28·5	16,530·0	11·1
Green Pod Seville	Sharpe	77	28·3	16,414·0	14·1

Broad beans grown as green fodder gave an average yield of 27,343 pounds per acre.

BEANS—SOWING AT DIFFERENT DATES

The first sowing was done on June 2 and the others at one week intervals up to June 23; Stringless Green Pod was the variety used in this experiment. The results obtained are shown in the following table:—

BEANS—RESULTS FROM SOWING AT DIFFERENT DATES

Sowing	Date	Date ready for use	Yield per 30-foot row
			lb.
1st sowing	June 2	Aug. 8	7·3
2nd sowing	" 9	" 15	10·5
3rd sowing	" 16	" 23	6·5
4th sowing	" 23	Sept. 2	6·3

Each year, the early seedings gave the best results. In this district, where the growing season is rather of short duration, sowing should be done as soon as all danger of frost has disappeared and when the earth has sufficiently warmed up.

BEANS—HILL VS. ROW CULTIVATION

Three varieties were sown on June 2 in thirty-foot rows, 30 inches apart; the plants were thinned 6 inches apart and one 30-foot row of each variety was sown in hills 24 inches apart. The following results were obtained:—

BEANS—RESULTS FROM HILL VS. ROW CULTIVATION

Variety	Length of season in days		Yield per 30-foot row	
	Rows	Hills	Rows	Hills
			lb.	lb.
Princess of Artois	65	65	9·0	5·3
Challenge	64	65	8·3	6·8
Interloper Challenge	64	64	18·5	8·8

BEETS—VARIETY TEST

Six varieties were sown in 30-foot rows, 30 inches apart, the plants being 3 inches apart in the rows. Germination was slow on account of the cold weather and excessive rains, but an application of nitrate of soda soon after emergence greatly stimulated the development of the beets and resulted in a fairly good yield. The results obtained are shown in the following table:—

BEETS—RESULTS OF VARIETY TEST

Variety	Origin	Days from seeding until ready for use	Yield of a 30-foot row	Yield per acre	Six-year average
			lb.	lb.	lb.
Half Long Dark	Kelway	82	64·0	37,120·0	.....
Detroit Dark Red	McDonald	81	63·8	37,004·0	22·5
Imp. Dark Red	Webb	85	54·3	31,494·0	.....
Eclipse	Vaughan	80	52·0	20,160·0	21·3
Black Red Ball	Burpee	80	46·8	27,144·0	15·7
Half Long Kitchener	Kelway	82	39·5	22,910·0	.....

The Detroit Dark Red, always gave good yields of well-shaped beets, which find a ready market; Half Long Dark, a new variety which has been under test for only two years, also gave a good yield of beets of very good shape which sell easily.

BEETS—SOWING AT DIFFERENT DATES

The beets were first sown as soon as the soil was in good condition and other sowings followed at one week intervals, up to June 12.

The Detroit Dark Red was used in this experiment; the results obtained are given in the following table:—

BEETS—RESULT OF SOWING AT DIFFERENT DATES

Sowing	Date	Date ready for use	Yield per 30-foot row	Four-year average
			lb.	lb.
1st sowing	May 15	Aug. 3	49·8	29·1
2nd sowing	May 22	Aug. 4	47·0	25·1
3rd sowing	May 29	Aug. 14	39·5	20·5
4th sowing	June 5	Aug. 19	29·0	12·5
5th sowing	June 12	Aug. 28	30·3	.....

The early seedings gave a better yield than the others, the beets are ready to be used earlier in the season, they are larger and better shaped.

BEETS—THINNING EXPERIMENT

Three thirty-foot rows of Detroit Dark Red were sown on May 15 in rows 30 inches apart. In the first row, the beets were thinned to two inches, in the second to three inches and in the third to four inches. The results obtained are as follows:—

BEETS—RESULTS OF THINNING EXPERIMENT

Distance between plants	Yield per 30-foot row	Yield per acre	Eight-year average yield per acre
	lb.	lb.	lb.
2 inches	48·0	27,680·0	12,644·0
3 inches	35·3	20,440·0	10,115·0
4 inches	38·5	22,330·0	10,208·0

As a rule, the beets thinned to two inches give very good yields; they are nearly always well shaped and of a good quality. Those thinned to three and four inches are generally of a larger size but not as well shaped as the former.

CABBAGE—VARIETY TEST

Cabbages were sown on April 16 in hotbeds and transplanted into the open on June 6 in 30-foot rows, 30 inches apart, the plants being 18 inches apart in the rows. The following results were obtained:—

CABBAGE—RESULTS OF VARIETY TEST

Variety	Origin	Days from sowing until ready for use	Yield per 60-foot row	Yield per acre	Five-year average
			lb.	lb.	lb.
Early June	Will	127	178·0	51,620	.....
Jersey Wakefield	McDonald	129	170·6	49,474	23,084
Copenhagen Market	Graham	120	138·0	40,020	29,986
All Head Early	Steele-Briggs	132	135·6	39·324	19,372
Charleston Wakefield	Graham	127	126·6	36,714	.....
Copenhagen Market Viking	Stokes	112	126·0	36,540	.....
Golden Acre	Harris	126	102·6	29,754	16,646
Baby Head	Graham	131	97·6	28,304	15,950
Flat Swedish	D. & F	111	74·0	21,460	16,327
Copenhagen Market	Stokes	125	68·6	19,894	.....
Danish Ballhead	S. B	182	33·0	9·570	10,295
Danish Ball S.S	Harris	182	16·0	4,640	12,789
Danish Ball, M.S	Burpee	191	10·0	2,900	.....

The three last-named varieties generally give good yields, but conditions were abnormal this year, the majority of the plants being destroyed by excessive rainfall when transplanted in the field. The few plants which recovered had a poor appearance and made a weak growth, which explains the low yield obtained.

CAULIFLOWER—VARIETY TEST

Eight varieties were sown in hotbeds on April 16 and transplanted into the open on June 9 in 30-foot rows, 30 inches apart, the plants being 18 inches apart in the rows. The following results were obtained:—

CAULIFLOWER—RESULTS OF VARIETY TEST

Variety	Origin	Days from sowing until ready for use	Yield per 30-foot row	Yield per acre	Three-year average
			lb.	lb.	lb.
Snowball	Madsen	125	18·0	10,440	.....
Early Dwarf Erfurt	Strandholm	108	15·8	9·164	.....
Veitch Autumn Giant	McDonald	134	13·5	7,830	.....
Six Weeks	McDonald	134	13·3	7,714	18·9
Danish Perfection	Madsen	114	12·5	7,250	.....
Large Late Algiers	D. & F.	136	12·0	6,960	.....
Snowball	Strandholm	114	11·3	6,554	20·1
Veitch Autumn Giant	Sutton	135	10·0	5,800	.....

Cauliflowers greatly suffered from excessive rainfall at the beginning of the season; they made a weak growth and had a poor appearance, and a great decrease in yield resulted. The best results were obtained from the Snowball (Madsen) and Early Dwarf Erfurt (Strandholm) varieties, which have been under test for the last two years.

PARSNIPS—VARIETY TEST

Five lots were sown on May 10 in 30-foot rows, 30 inches apart, the plants being 2 inches apart in the rows. The results obtained are given in the following table:—

PARSNIPS—RESULTS OF VARIETY TEST

Variety	Origin	Days from sowing until ready for use	Yield per 30-foot row	Yield per acre	Four year average
			lb.	lb.	lb.
Gurnsey	Rennie	93	41·0	23,780	18·7
Dobbie Select	Ewing	89	39·8	23,084	
Hollow Crown	McK.	89	37·5	21,750	16·6
Hollow Crown	C.E.F.	89	34·0	18,720	16·0
Elcombe Imp. Hollow Crown	Graham	83	33·5	19,430	15·8

A good yield of well-shaped parsnips was produced by the Guernsey (Rennie) variety.

PARSNIPS—SOWING AT DIFFERENT DATES

The first sowing was done as soon as the soil was in good condition and others at one-week intervals, up to June 23. Hollow Crown was the variety used in this experiment. The following results were obtained:—

PARSNIPS—RESULTS FROM SOWING AT DIFFERENT DATES

Sowing	Date	Ready for use	Yield per 30-foot row	Five-year average
			lb.	lb.
1st sowing	May 19	Aug. 16	39·0	19·3
2nd sowing	May 26	Aug. 19	32·0	17·6
3rd sowing	June 2	Aug. 30	27·5	14·0
4th sowing	June 9	Sept. 4	18·5	5·2
5th sowing	June 16	Sept. 15	10·5	.....
6th sowing	June 23	Oct. 8	4·0	.....

Parsnips should be sown as early as possible in the spring; that is as soon as the ground is ready. They give higher yields and are ready earlier than those of later sowings.

PARSNIPS—DISTANCES OF PLANTING

Three 30-foot rows, 30 inches apart, were sown on May 19, the Hollow Crown (C.E.F.) variety being used in this experiment. In the first row, the parsnips were thinned out to 2 inches apart, in the second to 3 inches, and in the third to 4 inches. The results obtained are as follows:—

PARSNIPS—RESULTS FROM PLANTING AT DIFFERENT DISTANCES

Distance between plants	Yield per 30-foot row	Yield per acre	Five-year average
	lb.	lb.	lb.
2 inches	31·5	18,270	10,208
3 inches	32·0	18,560	9,106
4 inches	30·5	17,690	9,199

The parsnips thinned to 2 and 3 inches are, as a rule, well shaped and of a good size; they generally yield more than those thinned to 4 inches.

CARROTS—VARIETY TEST

Eight varieties were sown on May 15, in 30-foot rows, 30 inches apart, and the plants were 1½ inch apart in the rows. The following results were obtained:—

CARROTS—RESULTS OF VARIETY TEST

Variety	Origin	Days from sowing until ready for use	Yield per 30-foot row	Yield per acre	Four-year average
			lb.	lb.	lb.
Intermediate	Rennie	79	109·5	63,510	53·4
Chantenay	McDonald	75	104·8	60,784	49·9
Early Scarlet Horn	D. & F.	75	104·8	60,784	48·7
St. Valery	D. & F.	80	100·3	58,174	40·3
Danvers	Rennie	77	97·3	56,434	40·2
Nantes	McDonald	74	93·0	53,940	47·7
Pride of Denmark	Will	74	70·5	40,890	
Chantenay	Ott.-285A	77	52·0	30,160	32·2

Rennie's Intermediate and Chantenay give very good yields, but the latter is preferable on account of its earliness, its better-shaped roots, and its excellent quality. The Intermediate is also of good quality, but the shape of the roots is not so good.

CARROTS—DIFFERENT DATES OF SOWING

The first sowing was done as soon as the soil was in good condition, and other sowings followed at one-week intervals, up to June 19. The variety used in this experiment was the Chantenay (McDonald). The following table gives the results obtained:—

CARROTS—RESULTS FROM DIFFERENT DATES OF SOWING

Sowing	Date	Ready for use	Yield per 30-foot row	Yield per acre	5-year average
			lb.	lb.	lb.
1st sowing	May 15	July 31	110·5	64,090	42·2
2nd sowing	May 22	Aug. 2	97·0	56,260	36·8
3rd sowing	May 29	Aug. 5,	88·3	51,214	34·3
4th sowing	June 5	Aug. 12	86·3	50,054	26·7
5th sowing	June 12	Aug. 14	70·5	40,890	.....
6th sowing	June 19	Aug. 28	38·5	22,330	.....

Early seedings give the best yields; the carrots are ready earlier and they have a much better shape than from the later sowings.

CARROTS—THINNING EXPERIMENT

Three 30-foot rows, 30 inches apart, were sown to Chantenay (McDonald) carrots on May 15. In the first row, the plants were thinned out to 1½ inch, in the second to 2 inches, and in the third to 3 inches. The following table shows the results obtained:—

CARROTS—RESULTS FROM THINNING EXPERIMENT

Distance between plants	Yield per 30-foot row	Yield per acre	5-year average
	lb.	lb.	lb.
1½ inch	66·0	38,280	19,430
2 inches	52·8	30,624	18,386
3 inches	43·3	25,114	13,804

Thinning to 1½ and 2 inches gave the best results: bigger yields, perfectly shaped carrots of good quality. The thinning to 3 inches also yielded well, but the carrots are always much larger and not as well shaped nor as good in quality as at the other two distances.

POTATOES—DIFFERENT DATES OF PLANTING

The first planting was done on May 21 and the others followed at one-week intervals up to June 18; the Irish Cobbler variety was used in this experiment. The following results were obtained:—

POTATOES—RESULTS FROM DIFFERENT DATES OF PLANTING

Date of planting	Quantity of seed per acre	Yield per acre	Marketable	Un-marketable	Five year average
	bush.	bush.	bush.	bush.	bush.
May 21	24·2	618·7	560·7	58·0	239·5
May 28	21·8	584·8	541·3	43·5	221·1
June 4	19·3	589·7	507·5	82·2	221·1
June 11	21·8	512·3	435·0	77·3	211·2
June 18	24·2	439·8	391·5	48·3	.....

If the quantity of seed potatoes used is taken into consideration, it is evident that the third planting—that of June 4—yielded more per bushel of seed than any of the other plantings.

As best results are generally obtained from the earlier dates of planting, potatoes should be put into the ground as soon as the soil is in good condition and sufficiently warm to guarantee good germination, provided of course that all danger of heavy frosts has disappeared. If put into practice, this method will result in higher yields and earlier potatoes.

POTATOES—DIFFERENT KINDS OF SETS

The object of this experiment is to determine the relative value of sets containing one, two, and three eyes. This experiment was first started five years ago. The following table shows the results obtained in 1930 as well as the average yield for the last five years:—

POTATOES—RESULTS FROM DIFFERENT KINDS OF SETS

Name of variety and number of eyes per set	Quantity of seed per acre	Yield per acre	Marketable	Un-marketable	Five-year average
	bush.	bush.	bush.	bush.	bush.
Green Mountain—					
1 eye	14·5	348·0	304·5	43·5	202·8
2 eyes	21·3	340·8	294·9	45·9	235·8
3 eyes	21·8	243·2	285·2	58·0	254·6
Irish Cobbler—					
1 eye	16·9	270·7	232·0	38·7	176·7
2 eyes	21·7	222·3	193·3	29·0	187·9
3 eyes	23·0	270·7	236·9	23·8	183·8

Again, in this case, if the quantity of seed per acre is taken into account, it is seen that the plot planted with one-eyed sets gave the highest yield. On the other hand, the sets which gave the best results for both varieties were the two- and three-eyed ones.

POTATOES WITH OR WITHOUT NITRATE OF SODA

Three hundred pounds of nitrate of soda per acre were applied in several applications; the first application was made soon after germination. Planting was done on May 22. The plot treated with nitrate of soda gave an average yield per acre of 448·5 bushels, while the check plot gave an average per acre of 314·3 bushels.

POTATOES—NUMBER OF CULTIVATIONS

The object of this experiment is to find out if the number of cultivations influences the yield. This is the fifth year of this experiment. The following able shows the results obtained in 1930, as well as the average yield over a five-year period. Green Mountain and Irish Cobbler were the varieties used in this experiment:—

POTATOES—RESULTS FROM NUMBERS OF CULTIVATIONS

Variety and number of cultivations	Yield per acre		Five-year average	
	Marketable	Unmarketable	Marketable	Unmarketable
	bush.	bush.	bush.	bush.
Green Mountain—				
8 cultivations	441·8	48·3	194·7	45·8
4 cultivations	400·2	46·2	169·3	48·1
Irish Cobbler—				
8 cultivations	378·9	66·7	159·6	48·4
4 cultivations	346·5	69·2	172·1	50·5

The results obtained during the last year show a higher average yield for the plots cultivated eight times; the Green Mountain variety, over a five-year period, has also produced more on the plots which received the larger number of cultivations. This shows that it is profitable to cultivate as often as possible in order to keep the soil in good tilth.

POTATOES—DISTANCES OF PLANTING BETWEEN THE SETS

The object of this experiment is to determine which spacing between sets gives the best yields. This experiment was started five years ago. The following table contains the results for the year 1930 as well as the average yield over a five-year period. Green Mountain and Irish Cobbler varieties were used in this experiment:—

POTATOES—RESULTS FROM DIFFERENT SPACINGS BETWEEN SETS

Variety	Distance between rows	Distance between sets	Quantity of seed used per acre	Yield per acre	Five-year average
	in.	in.	bush.	bush.	bush.
Green Mountain	30	12	20·3	557·9	274·9
Green Mountain	36	14	16·1	683·4	270·0
Irish Cobbler	30	12	20·1	455·2	218·3
Irish Cobbler	36	14	16·1	538·7	282·0

The best yields, for the Green Mountain variety, were obtained in plots where the sets were 12 inches apart and the rows 30 inches apart; on the other hand, Irish Cobbler yielded most in plots where the sets were 14 inches apart and the rows 36 inches apart.

POTATOES—SPROUTED VS. UNSPROUTED SETS

Potato sets were kept in a cool and dark cellar. A certain quantity of sets were allowed to sprout; they were kept outside the cellar, in the sun as much as possible, and they produced good strong sprouts. Planting was done on May 20; Green Mountain and Irish Cobbler were the varieties used in this experiment. The following table gives the results obtained:—

POTATOES—RESULTS FROM SPROUTED VS. UNSPROUTED SETS

Variety and kind of sets	Quantity of seed used per acre	Marketable yield	Unmarketable yield
	bush.	bush.	bush.
Green Mountain—			
Sprouted sets	19·3	468·8	53·2
Unsprouted sets	20·5	483·3	58·0
Irish Cobbler—			
Sprouted sets	19·3	406·0	87·0
Unsprouted sets	20·5	435·0	62·8

Taking into account the quantity of seed used per acre, Green Mountain gave the highest yield from sprouted sets, while Irish Cobbler gave a slightly higher yield from unsprouted sets. It appears that the best practice is to keep the seed potatoes in a cool and dark place, where they cannot sprout, so that they may keep their strength. Growers desirous of obtaining an early crop would be well advised to have their seed potatoes sprout a few days prior to planting, by placing them in a cool and sunny exposure so that the sets may produce strong and healthy sprouts. These sets require to be handled carefully when being planted, so as to avoid breaking off the sprouts.

Higher yields were obtained from unsprouted sets of both varieties, but potatoes produced by the sprouted sets were ready for use a little earlier than the others.

POTATOES—LEVEL VS. HILL CULTIVATION

A part of the plantation was hilled immediately after planting; the other part after the last cultivation. The results obtained are shown in the following table:—

POTATOES—RESULTS FROM LEVEL VS. HILL CULTIVATION

Variety and method of cultivation	Yield per acre	Marketable yield	Unmarketable yield
	bush.	bush.	bush.
Green Mountain—			
Level cultivation	534·5	500·7	33·8
Hill cultivation	315·9	292·2	22·2
Irish Cobbler—			
Level cultivation	551·0	493·0	58·0
Hill cultivation	461·0	425·3	34·8

CELERY—VARIETY TEST

Eight varieties were sown on April 12 in hotbeds and transplanted into the open on June 13, in 15-foot rows, 4 feet apart; the plants were 6 inches apart in the rows. The results obtained are given in the following table:—

CELERY—RESULTS OF VARIETY TEST

Variety	Origin	Date ready for use	Yield per 15-foot row	Four-year average
			lb.	lb.
Paris Golden Yellow	D. & F.	Sept. 15	30·8	17·9
Golden Self Blanching	McDonald	" 12	26·8	.....
Rose-ribbed	Bruce	" 15	23·8	.....
Emperor	Schell	Oct. 12	23·0	21·3
Giant Pascal	Graham	Sept. 20	22·8	21·4
Golden Plume	Dreer	" 20	14·0	16·5
Golden Self-Blanching	Ott.-4082	Oct. 2	7·5	13·0
White Plume	Graham	.....	0·8	.....

The yield of celery was greatly reduced by the excessive rainfall of the beginning of the season. A large number of seedlings died when transplanted, owing to the heavy rains and the cold weather.

RADISH—VARIETY TEST

Nine varieties were sown on May 14 in 30-foot rows, 15 inches apart; the results obtained are given in the following table:—

RADISH—RESULTS OF VARIETY TEST

Variety	Origin	Days from sowing until ready for use	Yield per 30-foot row	Five-year average
			lb.	lb.
Large White Icicle	D. & F.	44	21·0	.....
White Icicle	Patmore	43	16·0	.....
Saxa	McKenzie	43	15·0	9·6
Early White Turnip	Ewing	43	11·8	10·1
Scarlet Oval	Rennie	42	11·0	8·5
Scarlet Turnip White Tip	McDonald	43	7·3	7·3
Early Scarlet Globe	Vick	42	7·3	5·9
French Breakfast	Patmore	43	7·0	8·8
Twenty Days	Vaughan	41	6·5	7·1

LETTUCE—VARIETY TEST

Eleven varieties were sown on May 14 in 15-foot rows, 15 inches apart. The following table shows the results obtained:—

LETTUCE—RESULTS OF VARIETY TEST

Variety	Origin	Days from seeding until ready for use	Yield per 15-foot row	Five-year average
			lb.	lb.
Paris White Cos	Graham	53	39·5	21·8
Wonderful	Webb	49	25·3	16·1
All Heart	Dreer	51	24·3	13·6
Cos Trianon	Vaughan	53	24·0	25·5
Black Seeded Simpson	Vaughan	45	20·3	24·0
Grand Rapids	McKenzie	46	20·0	14·6
Big Boston	Graham	49	19·0	14·4
Big Boston	McDonald	45	19·0	.....
Crisp as Ice	Will	47	15·5	18·5
Salamander	McDonald	47	12·8	12·4
Iceberg	Ewing	49	10·0	11·5

The following varieties are very popular; they sell easily and produce good yields: Paris White Cos, Cos Trianon, Grand Rapids, and Big Boston.

SPINACH—VARIETY TEST

Four varieties were sown on May 14 in 30-foot rows 30 inches apart; the results obtained are as follows:—

SPINACH—RESULTS OF VARIETY TEST

Variety	Origin	Days from sowing until ready for use	Yield per 30-foot row	Four-year average
			lb.	lb.
New Zealand	Graham	71	45·5	40·1
Big Crop	Harris	47	15·5	11·0
King of Denmark	Graham	47	8·0	9·7
Giant Leaved	Stokes	49	4·8	.....

SALSIFY—VARIETY TEST

Three varieties were sown on June 14 in 30-foot rows, 30 inches apart, the plants being 1½ inch apart in the rows. The following results were obtained:—

SALSIFY—RESULTS OF VARIETY TEST

Variety	Origin	Days from sowing until ready for use	Yield per 30-foot row	Four-year average
			lb.	lb.
Mammoth Sandwich Islands	Rennie	111	47·0	25·8
Long White	Dreer	116	42·5	22·2
Long Black	D. & F.	129	17·5	.....

SWISS CHARD—VARIETY TEST

Two varieties were sown on May 15 in 30-foot rows, 30 inches apart. The results obtained are given in the following table:—

SWISS CHARD—RESULTS OF VARIETY TEST

Variety	Origin	Days from sowing until ready for use	Yield per 30-foot row	Four-year average
			lb.	lb.
Silver Leaf	Rennie	62	70·3	.....
Lucullus	Ewing	65	58·5	48·2

KOHL RABI—VARIETY TEST

Only one variety was under test; White Vienna; it was sown on April 29 in a hotbed and transplanted into the open on June 9, in 30-foot rows, 30 inches apart, the plants being 6 inches apart in the rows. This variety gave an average yield per acre of 62,060 pounds this year; its two-year average is 39,962 pounds.

BRUSSELS SPROUTS—VARIETY TEST

Five varieties were sown on April 16 in hotbeds and then transplanted into the open on June 9 in rows measuring 30 feet, 30 inches apart, with the plants 18 inches apart in the rows. The following table shows the results obtained: —

BRUSSELS SPROUTS—RESULTS OF VARIETY TEST

Variety	Origin	Days from sowing until ready for use	Yield per 30-foot row
			lb.
Little Gem	Barr	181	12·0
Dalkeith	McDonald	183	10·5
Edinburgh Prize	Ewing	179	8·5
Long Island	Vaughan	185	6·0
Improved Dwarf	Vaughan	185	5·0

PUMPKINS—VARIETY TEST

Seven varieties were sown on May 12 in hotbeds and transplanted on June 3 in hills 9 feet apart every way. The results obtained are as follows:—

PUMPKINS—RESULTS OF VARIETY TEST

Variety	Origin	Days from sowing until ready for use	Yield of three hills
			lb.
Connecticut Field	McDonald	108	61·5
King of Mammoth	Graham	102	54·0
Pie	Bran	114	53·0
Small Sugar	Graham	126	32·0
Omaha	Will	104	30·8
Orange White Luxury	Stoke	129	29·0
Sweet or Sugar	Ott. 110-15	135	25·0

On account of the cool weather of the beginning of the season, pumpkins made a very poor start.

SQUASH—VARIETY TEST

Nine varieties were sown on May 9 in hotbeds and transplanted on June 3, in hills 9 feet apart every way. The following table shows the results obtained:—

SQUASH—RESULTS OF VARIETY TEST

Variety	Origin	Days from sowing until ready for use	Yield of three hills	Three-year average
			lb.	lb.
English Vegetable Marrow	S.-B	105	50·8	25·9
Long White Bush	Ewing	94	43·0	39·5
Gilmour	Will	112	33·0	.....
Italian	Will	103	32·0	.....
Rubbard Green	Graham	117	31·0	16·9
Perfect Gem	Morse	139	30·3	11·8
Mandan	Will	106	20·0	.....
Golden Hubbard	Harris	126	18·0	17·5
Golden Hubbard	Ott. 4884	129	18·0	.....

Squash make slow progress at the beginning of their growth; for quite a while, the plants had a poor and weakly appearance.

CUCUMBERS VARIETY TEST

Nearly all varieties gave a light yield. Seeding was done in hotbeds on May 9 and the best plants were transplanted into the open on June 9, in hills 6 feet apart every way. Vegetation was slow at the beginning, on account of the excessive rains, which caused the death of many plants. Hardy plants, which outlived this rainy period, did not present a good appearance for the rest of the season.

CUCUMBERS—RESULTS OF VARIETY TEST

Variety	Origin	Days from seeding until ready for use	Yield of three hills
			lb.
Early Russian	Burpee	102	10·0
Double Yield	Harris	102	9·5
Early Fortune	McDonald	103	7·3
Giant Pera	D. & F.	102	6·8
Imp. Large Green	McDonald	103	6·3
Green Pack	Stockes	103	6·0
Earliest of All	Will	104	5·3

PARSLEY—VARIETY TEST

Two varieties were sown on May 15 in 30-foot rows, 30 inches apart; the results obtained are given in the following table:—

PARSLEY—RESULTS OF VARIETY TEST

Variety	Origin	Number of days from sowing until ready for use	yield per 30-foot row	Two-year average
			lb.	lb.
Triple Curled	Ewing	67	28·8	24·5
Moss Curled	Ewing	71	9·8	6·7

TABLE TURNIPS—VARIETY TEST

Six varieties were sown on May 15 in 30-foot rows, 15 inches apart, with the plants 2 inches apart in the rows. The following table shows the results obtained:—

TABLE TURNIPS—RESULTS OF VARIETY TEST

Variety	Origin	Number of days from sowing until ready for use	Yield per 30-foot row	Five-year average
			lb.	lb.
Red Top Strap Leaf	McDonald	64	73·5	37·5
Extra Early Purple Top Milan	McDonald	62	69·8	36·1
Early White Milan	Harris	62	54·3	28·5
Early Flat White Dutch	Wills	65	38·0	.....
Yellow Aberdeen	Wills	69	36·3	.....
White Sweet Russian	Wills	71	15·3	.....

LEEKS—VARIETY TEST

Two varieties were sown in hotbeds on April 19 and transplanted on June 11 in 30-foot rows, 15 inches apart, with the plants 2 inches apart in the rows. The results obtained are as follows:—

LEEKS—RESULTS OF VARIETY TEST

Variety	Origin	Days from sowing until ready for use	Yield per 30-foot row
			lb.
Champion Prize	Webb	176	22·5
Musselburg	Graham	184	8·3

OTHER VEGETABLES UNDER TEST

The following herbs or vegetables were sown on May 15 in 30-foot rows, 15 inches apart; the following results were obtained:—

OTHER VEGETABLES—RESULTS OF VARIETY TEST

Kind	Variety	Origin	Number of days from sowing until ready for use	Yield per 30-foot row
				lb.
Dandelion	Thickleaf	Sutton	116	4·5
Dandelion	Broadleaf	Sutton	110	9·0
Fennel	Sweet	Sharpe	150	3·5
Sage		S. B.	148	2·5
Savory	Summer	S. B.	116	12·3
Chervill	Double Curled	McDonald	61	12·5
Endives	Green Curled	Bruce	62	13·3

TOMATOES—VARIETY TEST

Twenty-eight varieties were sown on April 12 in hotbeds and transplanted into the open on June 12. The plants made a good recovery and the majority produced ripe fruit, Fargo and Viking being outstanding in this respect. The results obtained from the variety test are shown in the following table; they are for five plants, planted at 4-foot intervals every way:—

TOMATOES—RESULTS OF VARIETY TEST

Variety	Origin	Days from sowing until ready for use	Yield of ripe fruit	Yield of green fruit
			lb.	lb.
Viking	C.E.F.	118	6·3	10·2
Red Head	Will	131	3·0	12·3
John Baer	S.B.	126	2·3	11·5
Fargo	C.E.F.	118	6·5	7·0
Bonny Best	Keith	131	3·3	9·2
Chalk Early Jewel	S.B.	131	1·3	10·5
Agassiz	Will	128	3·8	7·5
Gulf State Market	Ferry	132	2·8	8·5
Landreth	Landreth	132	1·3	9·2
Pink No. 1	Ott. 9731	127	3·8	6·2
First of All	McKenzie	127	4·3	5·2
Earliana	Ferry	128	4·0	4·8
John Baer	And. Mtn.	138	0·5	7·5
Bloomsdale	Landreth	131	1·0	6·3
Herald	Ott. 9726	127	3·0	4·3
Marglobe	Stoke	134	1·3	5·7
Livingston Dwarfstone	Livingston	136	0·5	6·3
Alacrity	Ott. 6365	130	3·3	3·5
Burbank	Stark	131	1·3	5·2
Greater Baltimore	Ferry	132	1·5	4·8
Livingston Globe	Ott. 1813	130	1·5	4·8
Earliana Gr. 2	Langdon	140	1·5	4·5
Sparks Earliana	Burpee	130	3·0	3·0
Rosy Morn	Livingston	128	1·8	3·5
Matchless	Bruce	142	0·3	3·5
Northern	Livingston	134	0·5	2·5
Coreless	Livingston	138	.....	2·8
Crimson Cushion	Henderson	137	.....	2·0

RESULTS OBTAINED FROM THE USE OF PAPER MULCH (GATER HIDE BRAND) IN VEGETABLE GROWING

BEANS—ROUND POD KIDNEY WAX

Date of planting	Date of first bloom	Date ready for use	Height at the end of 3 weeks	Height when ready for use	Weight of green beans
			in.	in.	lb.
With paper mulch:—					
June 2	July 24	Aug. 7	8	15	13·8
Without paper mulch:—					
June 2	July 24	Aug. 7	6	11	3·3

BEANS—STRINGLESS GREEN POD

Date of planting	Date of first bloom	Date ready for use	Height at the end of 3 weeks	Height when ready for use	Weight of green beans
			in.	in.	lb.
With paper mulch:—					
June 2	July 24	Aug. 7	8	15	11·0
Without paper mulch:—					
June 2	July 24	Aug. 7	8	13	8·0

CAULIFLOWERS—SUPER SNOWBALL

The crop of cauliflowers from the two plots was an almost complete failure; recovery at transplanting time was very poor and all plants were attacked by the root maggot, which destroyed most of them before they were able to head.

CABBAGE—GOLDEN ACRE

Date of planting	Date when first firm head measured 6 inches in diameter	Date when six first firm heads measured 6 inches in diameter	Total weight of heads
			lb.
With paper mulch—			
June 9	Aug. 7	Aug. 17	110·5
Without paper mulch—			
June 9	Aug. 12	Aug. 21	53·0

BEETS—DETROIT DARK RED

Date of planting	Date when first beet measured 1½ inches in diameter	Number of beets measuring 1½ inches at first date	Weight of green crop	Weight of crop at maturity
			lb.	lb.
With paper mulch—				
May 15	Aug. 5	6	21·8	42·0
Without paper mulch—				
May 15	Aug. 12	3	11·8	28·0

CARROTS—CHANTENAY

Date of planting	Date when first carrots measured 1 inch in diameter	Number of carrots measuring 1 inch in diameter at first date	Number and weight of green carrots pulled		Number and weight of carrots pulled in the fall	
			No.	lb.	No.	lb.
With paper mulch—						
May 15	Aug. 5	6	243	27·5	250	83·0
Without paper mulch—						
May 15	Aug. 5	2	223	19·3	231	70·0

LETTUCE—ICEBERG

Date of planting	Date of cutting of first good head	Date of cutting of six first good heads	Weight of six average heads	Total weight of crops
			lb.	lb.
With paper mulch—				
May 15	July 12	July 18	3·0	55·8
Without paper mulch—				
May 15	July 19	July 23	2·8	31·5

SPINACH—KING OF DENMARK

Length and width of leaf 4 weeks after planting	Date when the seed stem first appeared	Weight of fifteen heads when ready to be used	Comparative strength
		lb.	
With paper mulch— Length, 3 inches; width, 1¾ inches	June 30	8·5	Medium
Without paper mulch— Length, 3 inches; width, 1½ inches	June 30	5·0	Poor

TOMATOES—ALACRITY

Date first ripe fruit was pulled	Date first six ripe fruit were pulled	Total weight of ripe fruit	Total weight of green fruit
		lb.	lb.
With paper mulch— August 26	Sept. 3	7·5	23·0
Without paper mulch— August 30	Sept. 5	5·0	23·3

POTATOES—GREEN MOUNTAIN

Date of planting	Date of emergence of 50 per cent of the plants	Date of full bloom	Quantity pulled on Aug. 15	Marketable	Unmarketable	Date when 75 per cent of the foliage had died	Quantity pulled in the fall	Marketable	Unmarketable
			lb.	lb.	lb.	By late blight	lb.	lb.	lb.
With paper mulch— May 22	June 14	July 19	22·0	15·5	6·5	Sept. 15	48·0	42·0	6·0
Without paper mulch— May 22	June 14	July 19	18·5	12·0	6·5	Blight Sept. 15	40·0	35·0	5·0

IRISH COBBLER

With paper mulch:— *May 22*	June 14	July 21	23·5	16·0	7·5	Blight Sept. 20	46·0	39·0	7·0
Whithout paper mulch:— *May 22*	June 14	July 23	19·0	15·0	4·0	Blight Sept. 20	35·0	29·0	6·0

CEREALS

Cereal plots were seeded on May 19 and 20. The growth was delayed somewhat at the start by the heavy rainfall in June, which favoured a rapid development of the clover to the detriment of the cereals.

All varieties ripened, but the majority, especially wheat, suffered from rust. Very little injury was caused by smut diseases, as only traces here and there were noticed.

EXPERIMENTAL WORK

The experiments on cereals consist in growing on plots different strains and varieties, with a view to ascertaining the earliest, most productive, and most resistant to diseases.

Two kinds of plots were sown this year, viz., rod-row plots and $\frac{1}{120}$th-acre plots. Under the rod-row system, small plots, each consisting of five rows, measuring 18·5 feet in length, are sown to each variety under test and this sowing is replicated several times. The same varieties were sown on five different plots in 1930. At harvest, both ends of each plot are trimmed one foot, thus reducing the plot to one rod in length (16½ feet). The two outside rows of each plot act as buffer rows to the three middle ones, which alone are used in computing the yield per acre. To obtain the yield per acre, the yield in grams of each plot is taken, then divided by three, which gives the yield per row; this figure is then multiplied by ten, and the result obtained is the yield per acre, in pounds. This yield is then divided by the number of pounds per bushel, and the result is the number of bushels produced per acre.

In the $\frac{1}{120}$th-acre plots, as well as in the rod-row plots, the sowing is replicated five times for each variety; a slightly larger surface is sown, to allow for trimming each end and removing the two outside rows, so that finally the plot measures $\frac{1}{120}$th acre.

In order to improve the physical and chemical condition of the soil, it was deemed advisable to modify the rotation which has been practised in the past; the four-year rotation was discarded and replaced by a three-year rotation, including the following crops: first year, sunflowers with an application of 16 tons of manure per acre; second year, cereals with an application of 2 tons ground limestone per acre; third year, clover hay.

SPRING RYE—AVERAGE OF FIVE ROD-ROW PLOTS

Variety	Number of days to ripen	Average length of straw	Strength of straw, 10-point scale	Yield in grain	
				1929	1930
		in		bush.	bush.
O.A.C. 61	113	41·6	8·0	16·9	11·0
Select Ottawa	114	43·0	8·0	16·6	9·1

TEST OF VARIETIES AND STRAINS OF CEREALS ON $\frac{1}{120}$ ACRE PLOTS

These plots were sown on May 19 on well prepared soil but the yields were reduced by excessive rainfall in June. All varieties included in this test ripened.

The data submitted represent the average of five plots in the case of each variety.

WHEAT

Five varieties of wheat were sown on May 20; they suffered greatly from the rust, the Reward to a lesser extent than the others.

WHEAT—RESULTS IN 1930

Variety	Number of days to ripen	Average length of straw including head	Strength of straw, 10-point scale	Yield of grain	
				1929	1930
		in.		bush.	bush.
Reward Ott. 928	107	32·4	9·9	8·5	16·7
Garnet Ott. 652	108	34·0	9·7	9·1	14·9
Pringle's Champlain 307 M.C	124	39·4	9·8	.....	14·7
Marquis Ott. 15	124	38·2	9·7	.....	13·9
Huron Ott. 3	123	39·8	9·8	.....	13·8

OATS

Six varieties were sown on May 19; although their start was delayed by excessive rainfall, they all matured. The results obtained are given in the following table:—

OATS—AVERAGES FOR FIVE PLOTS

Variety	Number of days to ripen	Average length of straw	Strength of straw, 10-point scale	Yield of grain	
				1929	1930
		in.		bush.	bush.
Gold Rain S.W	122	36·6	9·8	.....	32·0
Alaska G	115	33·2	9·8	23·7	30·0
Brome M.C	120	36·2	9·5	.....	27·7
Legacy	121	31·6	9·8	.....	27·4
Banner 44 M.C	123	36·2	9·7	.....	26·8
Cartier M.C	117	33·6	9·8	17·1	26·7

BARLEY

Nine varieties were sown on May 19, on well prepared soil, but germination and growth were delayed by heavy rains in June. Of all cereals, barley suffered most from these adverse conditions. All varieties ripened, however. The results obtained are as follows:—

BARLEY—AVERAGE OF FIVE PLOTS

Variety	Number of days to ripen	Average length of straw including head	Strength of straw, 10-point scale	Yield of grain	
				1929	1930
		in.		bush.	bush.
Bearer, Ott. 457	109	40	9·1	9·4	30·37
Star	104	31	9·4	15·4	26·55
Manchurian C.R. 14	108	39	9·1	11·9	25·77
O.A.C. 21	106	37	9·3	15·1	21·40
Pontiac M.C	106	40	9·3	6·4	20·45
Charlottetown 80	110	34	9·6	11·1	20·35
Mensury Ott. 60	106	42	9·2	10·2	20·27
Hannchen	110	34	9·4	8·5	16·55
Monck M.C	106	.....	9·5	12·4	15·45

PEAS

Peas were sown on May 21 but the period of growth was prolonged by the rainy weather, and as a result the crop did not ripen satisfactorily. At harvesting time, during the last days of September, the majority of the varieties still had flowers. Most of them would have given a fairly high yield but they included a heavy proportion of green peas. They matured in the following order: O.A.C. 181, Chancellor, Golden Vine, Arthur and Mackay.

AUTUMN WHEAT AND RYE

A new experiment was launched during the fall of 1930 when a number of winter wheat and rye varieties was sown. The sowing took place under good conditions and the stand was uniform in the fall, the plots presenting a good appearance.

FORAGE CROPS

Experiments and tests were conducted during 1930 with a view to ascertaining the best varieties of corn, sunflowers, field roots, grasses and clovers. Different combinations of cereals, grasses and clover were tested for hay production. All the tests were conducted in quadruplicate plots $\frac{1}{100}$ of an acre in size, with the exception of the annual hay plots which were replicated four times.

SUNFLOWERS—VARIETY TEST

Five varieties of sunflowers were sown on May 22 in rows 36 inches apart with plants 6 inches apart in the rows. They were harvested on September 15 and the following results were obtained:—

SUNFLOWERS—RESULTS OF VARIETY TEST

Variety	Origin	Yield per acre			
		Green weight		Dry matter	
		ton	lb.	ton	lb.
Mammoth Russian	K. McDonald	13	1,950	1	1,484
Ottawa 76	C.E.F.	8	900	1	28
Manchurian	McKenzie	7	300	..	1,859
Mennonite	Rosthern	5	1,440	..	1,201
Mammoth Russian	Disco	4	1,880	..	1,166

CORN—VARIETY TEST

Six varieties of corn were sown on May 22 in rows 36 inches apart with the plants 6 inches apart in the rows. The corn was cut on September 15 and the results appear in the table following:—

CORN—RESULTS OF VARIETY TEST

Variety	Origin	Yield per acre			
		Green weight		Dry matter	
		ton	lb.	ton	lb.
Yellow Dent	Wimple	3	.....	..	552
Burr Leaming	Carter	2	1,400	..	464
Amber Flint	Wimple	2	500	..	455
Twitchell's Pride	C.E.F.	2	700	..	432
Bailey	Bundy	2	200	..	416
Minnesota	Disco	2	100	..	390

ANNUAL HAY CROPS

It has been found that annual hay crops supply good feed for milch cows, and are the best crops to grow on newly broken land. For this reason they should be widely grown in a new district like ours where an endeavour is being made to increase the acreage under cultivation, and to develop all branches of dairying.

Annual hay crops, sown on land broken in June, yield in the fall a large quantity of succulent fodder for hay or for silage.

Nineteen different mixtures or combinations were sown on 1/120 acre plots replicated four times on May 22. The soil was in good tilth. Oats, peas, and the mixture of oats, peas and vetches germinated and grew well, while other crops, such as Hog millet, Golden millet, Japanese millet, Sudan grass and Teff grass were unproductive.

Harvesting took place on August 19 and 21. The following results were obtained:—

ANNUAL HAY CROPS—RESULTS OF VARIETY TEST

Crop or combination of crops	Rate of seeding per acre	Rate of yield per acre			
		Green weight		Hay, 15 p.c. moisture	
	bush.	ton	lb.	ton	lb.
Combination C (peas ½ bush., oats 2 bush., vetch ½ bush.)	3·0	9	1,600	2	479
Oats, Alaska	2·5	6	1,200	2	316
Combination A (peas 1 bush., oats 2 bush.)	3·0	8	1,600	2	206
Combination B (peas ¾ bush., oats 2 bush., vetch ¼ bush.)	3·0	9	200	2	59
Combination D (peas 1 bush., oats 1½ bush., vetch ½ bush.)	3·0	8	1,900	1	1,813
Hulless barley	2·0	5	900	1	1,771
Oats, O.A.C., 72	2·5	6	1,800	1	1,726
Oats, Banner	2·5	7	800	1	1,700
Peas, Prussian Blue	2·5	11	400	1	1,402
Peas, Mackay	2·5	10	700	1	1,084
Peas, Arthur	2·5	10	1,700	1	973
Peas, Chancellor	2·5	8	600	1	906
Peas, Golden Vine	2·5	9	1,100	1	655
Vetch, black	1·0	6	.....	..	1,716

FIELD ROOTS—VARIETY TEST

A large number of varieties of field roots, including mangels, swedes, carrots and turnips, were sown on May 21. Germination and growth were good at the start and hopes of a bumper crop were entertained, as the sowing had been done one month earlier than usual. However, about July 15, cutworms and aphids made their appearance and although the plants had made a remarkable growth by this time, they were unable to resist the attacks of these insects and incurred great damage, notwithstanding the use of poisoned bran for the cutworms and of oil emulsion for the aphids. The efficiency of these two treatments was greatly lessened by frequent rains at that time. The damage caused by the insects was so great that any comparison between the varieties would be inaccurate and therefore misleading.

LEGUMES AND GRASSES FOR HAY PRODUCTION—VARIETY TEST

Several strains and varieties of clover and grasses, sown alone or in combination, during the spring of 1929, produced their first hay crop this year. The land was well drained, growth was good and a fairly heavy crop was harvested during the latter part of July and the beginning of August.

WHITE DUTCH CLOVER—VARIETY TEST

Five varieties of White Dutch clover were harvested on July 31. The following results were obtained:—

WHITE CLOVER—RESULTS OF VARIETY TEST

Variety	Rate of seeding per acre	Yield per acre	
		Green weight	Hay, 15 p.c. moisture
	lb.	ton lb.	ton lb.
Ladino	4	3 1,620	.. 1,680
Danish Morso	4	3 500	.. 1,586
Danish Stryno	4	3 300	.. 1,531
Kentish Wild	4	3 1,400	.. 1,415
Buckinghamshire	4	2 1,900	.. 1,410

ALSIKE CLOVER

Only one variety of Alsike clover was tested. The results obtained were as follows:—

ALSIKE CLOVER

Variety	Rate of seeding per acre	Yield per acre	
		Green weight	Hay, 15 p.c. moisture
	lb.	ton lb.	ton lb.
Ordinary commercial alsike clover	8	7 500	1 1,248

RED CLOVER—VARIETY TEST

Four varieties of red clover were harvested on August 1. The results obtained are shown in the following table:—

RED CLOVER—RESULTS OF VARIETY TEST

Variety	Rate of seeding per acre	Yield per acre	
		Green weight	Hay, 15 p.c. moisture
	lb.	ton lb.	ton lb.
Late Swedish	12	8 1,800	2 1,034
Oxdrift	12	7 200	1 1,323
Ste-Rosalie	12	7 300	1 1,303
Chateauguay	12	5 100	1 1,000

ALFALFA—VARIETY TEST

Three varieties of alfalfa were harvested on July 31. The results obtained were as follows:—

ALFALFA—RESULTS OF VARIETY TEST

Variety	Rate of seeding per acre	Yield per acre			
		Green weight		Hay, 15 p.c. moisture	
	lb.	ton	lb.	ton	lb.
Medicago falcata	20	3	700	1	499
Ontario variegated	20	3	200	1	102
Grimm	20	3	200	..	1,965

SWEET CLOVER—VARIETY TEST

Four varieties of sweet clover were harvested on August 1 with the following results:—

SWEET CLOVER—RESULTS OF VARIETY TEST

Variety	Rate of seeding per acre	Yield per acre			
		Green weight		Hay, 15 p.c. moisture	
	lb.	ton	lb.	ton	lb.
Grundy (Disco)	20	4	.....	1	856
Zouave 778	20	4	700	1	506
Arctic 439	20	3	200	1	65
Common White (McDonald)	20	3	1,400	1	5

GRASSES—TEST OF DIFFERENT GRASSES

Eight strains of different grasses were harvested on August 4. The results are given in the following table:—

GRASSES—RESULTS OF TEST OF DIFFERENT GRASSES

Grass	Rate of seeding per acre	Yield per acre			
		Green weight		Hay, 15 p.c. moisture	
	lb.	ton	lb.	ton	lb.
Common red top	20	3	800	1	414
Meadow fescue	30	2	1,400	1	.....
Tall oat grass	25	2	1,400	..	1,647
Brome grass	14	2	600	..	1,481
Timothy (commercial)	12	1	1,600	..	1,350
Orchard grass	30	2	800	..	1,272
Kentucky blue grass	20	2	.....	..	1,208
English rye grass	14	1	600	..	645

COMBINATIONS OF GRASSES AND LEGUMES—RESULTS OF VARIETY TEST

Combination	Rate of seeding per acre	Yield per acre			
		Green weight		Hay, 15 per cent moisture	
	lb.	ton.	lb.	ton.	lb.
Timothy	6				
Meadow fescue	4				
Red clover	8				
Alsike clover	2	7	300	2	748
Kentucky blue grass	2				
Common red top	2				
White clover	1				
Alfalfa	2				
Timothy	6	7	200	2	474
Red clover	5				
White clover	1				
Timothy	6				
Common red top	2				
Meadow fescue	4	7	800	2	425
Red clover	10				
Kentucky blue grass	2				
White clover	1				
Timothy	8				
Red clover	8				
Alsike clover	2	7	700	2	395
Kentucky blue grass	2				
Common red top	2				
White clover	1				
Timothy	6				
Meadow fescue	4				
Red clover	8	7	800	2	292
Alsike clover	2				
White clover	1				
Timothy	6				
Meadow fescue	4	6	1,600	2	194
Red clover	10				
White clover	1				
Timothy	8				
Red clover	10	6	700	2	89
White clover	1				
Alfalfa	6				
Timothy	6				
Red clover	10	6	1,900	2	87
Alsike clover	2				
White clover	1				
Timothy	6				
Orchard grass	4	7	1,200	2	74
Red clover	10				
White clover	1				
Timothy	8				
Red clover	10				
Kentucky blue grass	2	6	1,400	2	60
Red top	2				
White clover	1				
Timothy	8				
Alsike clover	4	7	600	1	1,927
White clover	1				
Timothy	8				
Red clover	8	7	300	1	1,875
Alsike clover	2				
White clover	1				
Timothy	8				
Alsike clover	4				
Kentucky blue grass	2	6	1,500	1	1,659
Red top	2				
White clover	1				

POULTRY

Barred Plymouth Rock hens and Pekin ducks are bred on this Station. On December 31, 1930, our flock included 393 birds, as follows: 31 Barred Plymouth Rock cocks and cockerels and 344 hens and pullets, and 6 Pekin males and 14 females.

EXTENSION WORK

Practically no inspection work of individual poultry plants has been done by this Station since the Government appointed a poultry promoter for the district. Extension work consists mainly in the sale of day-old chicks, pullets, cockerels, hens and roosters for breeding purposes. Correspondence on poultry matters is continually on the increase. Last year, the following were sold to farmers for breeding purposes: 7,083 day-old chicks, 382 hens and pullets, 77 cocks and cockerels, 105 hatching eggs, 140 8-week pullets and 6 8-week cockerels.

INCUBATION

Two Jamesway incubators, with a total capacity of 6,440 eggs, were used this year. The number of eggs set was 13,817; the percentage of fertility was 85·6 and the percentage of fertile eggs hatched 71·5; 97·9 of the chicks hatched were alive three weeks after hatching. Incubation operations lasted three months; the following results were obtained:—

Results of Incubation Operations

Month	Number of eggs set	Per cent of fertile eggs	Per cent of fertile eggs hatched	Per cent of chicks alive at age of 3 weeks	Number of eggs required to hatch one chick	Number of eggs required to hatch a 3-week old chick
March	3,556	83·5	66·5	98	1·8	1·8
April	6,174	86·1	69·6	97·8	1·6	1·7
May	4,087	86·6	78·6	97·9	1·4	1·5

May proved to be the most satisfactory month for hatching.

MATINGS AND PEDIGREE BREEDING

The twenty-four best hens, which will be used for breeding purposes in the spring of 1931, gave an average production of 258 eggs. At the present time, our flock includes 133 hens having laid more than 200 eggs, and the average of the forty-eight best layers is 249·25 eggs. A hen must lay at least 200 eggs in order to be used in our pedigree breeding; a registered male will head each breeding pen.

REGISTRATION

At the egg-laying contests last year, thirteen of the hens which were entered by this Station qualified for registration; up to date, 38 hens from this Station have been registered, 9 of which are second and third generation birds. The total number of registered cockerels to date is 27.

Our first three breeding pens are made up entirely of registered birds.

COST OF ARTIFICIAL INCUBATION

In order to find out the total cost of artificial incubation, a record was kept of the number of eggs set, the cost of these eggs, the amount of electricity consumed in kilowatt hours and its cost, the cost of oil, the amount of manual labour employed, and its cost. The eggs were valued at $5 per hundred, electricity at 8 cents per kilowatt hour, oil at 35 cents per gallon, and manual labour at 30 cents per hour. The following results were obtained:—

SUMMARY OF THE COST OF ARTIFICIAL INCUBATION

Number of eggs set		13,817
Number of eggs hatched		8,458
Value of eggs	$	690 85
Electricity consumed (kilowatt hours)		432
Cost of electricity	$	34 56
Oil consumed	gal.	60
Cost of oil	$	21 00
Manual labour, 300 hours at 30 cents	$	90 00
Total cost	$	836 41
Cost per egg	cts.	6·1
Cost per live chick	cts.	9·9

LOSS OF WEIGHT IN EGGS DURING INCUBATION

This experiment was undertaken in order to ascertain the loss of weight in eggs during the period of artificial incubation. Eggs were marked and weighed at different intervals during the incubation period and the total loss of weight per egg for the entire period amounted to 0·327 ounce under hatching results as indicated, namely, 71·5 per cent of fertile eggs hatched.

COST OF ARTIFICIAL BROODING

The object of this experiment was to determine the cost of artificial brooding of a chick from its birth until it has no further need of artificial heat, a period of six weeks. The following results were obtained:—

COST OF ARTIFICIAL BROODING—SUMMARY

Number of chicks		1,687
Quantity of coal consumed	lb.	7,634
Cost of coal at $15.95 per ton	$	60 89
Cost of grain, 2,109 pounds at $2.90 per 100 pounds	$	61 16
Cost of mash, 1,265 pounds at $2.60 per 100 pounds	$	32 89
Cost of butter milk, 1,500 pounds at 35 cents per 100 pounds	$	5 25
Cost of cod liver oil, 16½ quarts at 27½ cents per quart	$	4 58
Cost of manual labour, 210 hours at 30c per hour	$	63 00
Total cost	$	227 77
Cost per chick	cts.	13·5

POTATOES AS A SUBSTITUTE FOR CORNMEAL FOR FATTENING COCKERELS

This experiment was undertaken in order to find out if it would be economical to use small potatoes as a substitute for cornmeal in the fattening of cockerels.

Three groups of twelve cockerels each were crate-fed; group 1 received a wet mash composed of cornmeal, middlings and rolled oats in equal parts; these birds also received skim-milk.

Group 2 received a mash made up in equal parts of middlings, rolled oats and boiled potatoes; they were also fed skim-milk.

Group 3 received the same mash as group 2, but no skim-milk.

Each group was fed 2½ per cent charcoal in the mash and a meal of sprouted oats was given from time to time at the noon hour; the mash was fed morning and night. The following table shows the results obtained during the years 1928-29-30.

It should be noted that in 1928 the groups included four cockerels each, while in 1929 and 1930 they were made up of twelve cockerels each.

FATTENING OF COCKERELS—POTATOES VS. CORNMEAL

Group number, and special feed given	Year	Initial weight	Weight after fattening	Value at beginning of test	Value at end of test	Increase in value	Cost of feed	Total profit	Profit per cockerel
		lb.	lb.	$	$	$	$	$	cts.
No. 1 (cornmeal)	1928	23·25	26·5	6 98	9 28	2 30	1 27	1 03	26
	1929	77·5	89·5	23 25	31 33	8 08	4 88	3 20	27
	1930	78·0	86·7	23 40	20 35	6 95	3 85	3 15	26¼
No. 2 (potatoes with skim-milk)	1928	21·5	24·75	6 45	8 66	2 21	0 97	1 24	31
	1929	72·5	83·5	21 75	29 23	7 48	3 10	4 38	36½
	1930	80·25	86·4	24 08	30 24	6 16	2 40	3 76	31·3
No. 3 (potatoes without skim-milk)	1928	22·5	24·75	6 75	8 66	1 91	0 92	0 99	25
	1929	76·25	83·5	22 88	29 23	6 35	2 58	3 77	31·4
	1930	77·25	82·0	23 18	28 70	5 52	2 20	3 32	27·6

Group 2, fed with cooked potatoes in addition to the meal and skim-milk, gave the largest profit as well as the best tasting meat.

Group 1, which received a corn meal mash and skim-milk, produced the best-looking chickens for the market. This experiment will be continued for two more years before definite deductions are drawn.

FATTENING AND FINISHING CAPONS—METHODS AND RATIONS

The object of this experiment was to ascertain the best method to follow in the fattening and finishing of capons. Three groups, each numbering 6 capons, were used. Group 1 was crate fattened and received a ration with the following composition: cornmeal 2 parts, middlings 1 part, rolled oats 1 part.

Group 2 was also crate-fed and received a ration with barley as a basis, made up of the following: ground barley 2 parts, middlings 1 part, rolled oats 1 part.

Group 3 was fattened in pens by means of the usual ration that is to say these birds received grain morning and night with a wet mash at noon. This is more a growing ration than a fattening one.

The mash was mixed with skim-milk for each group. The following results were obtained:—

FATTENING AND FINISHING CAPONS—METHODS FOLLOWED AND RATIONS GIVEN

Group and special feed given	Initial weight	Weight after test	Value at start	Value after test	Increase in value	Cost of feed	Profit	Profit per capon
	lb.	lb.	$	$	$	$	$	cts.
Group 1—Corn	38	40	11 40	14 00	2 60	1 32	1 28	21·3
Group 2—Barley	37¼	38	11 18	13 30	2 12	1 25	0 87	14·5
Group 3—Usual ration	39¼	45	11 78	15 75	3 97	1 26	2 71	45·0

Grading for finish and appearance of capons for the market is as follows:—

1st, group 2, barley; 2nd, group 1, corn; 3rd group 3, usual ration. As may be seen in the above table, one may be led to believe that fattening capons in pens is more profitable than crate fattening; however, it will be necessary to continue this experiment for another four years before drawing any conclusions.

CAPONS VERSUS ROASTERS

The object of this experiment is to find out if it is better to sell surplus cockerels as roasters or to keep and fatten them as capons.

Four groups each including 10 chickens were used in this experiment; two of the groups were caponized and the other two were kept as roasters.

The experiment is divided into two periods; during the first, one group of roasters and one of capons were sold when prices were highest for roasters, and during the second period, the remaining groups of roasters and capons were sold when best prices could be had for the latter.

Data relating to the initial cost of the birds, the percentage of mortality, the increase in weight, the feed consumed and the profit for each group, were recorded. The following results were obtained:—

CAPONS VS. ROASTERS—RESULTS IN 1930

	1st period		2nd period	
	Capons	Roasters	Capons	Roasters
Group....No.	1	2	3	4
Number of birds per group....No.	10	10	10	10
Initial cost....$	4 00	4 00	4 00	4 00
Initial weight....lb.	22	24	21	24½
Final weight at end of test....lb.	76	69	79	76
Increase in weight....lb.	54	45	58	51½
Duration of experiment....days	95	95	156	156
Value at end of experiment....$	22 80	20 70	27 65	22 80
Cost of feed....$	5 80	6 00	9 70	10 20
Profit....$	13 00	10 70	13 95	8 60
Profit per bird....$	1 30	1 07	1 40	0 86

Capons proved to be more profitable during both periods, especially during the second, when they brought 54 cents more per bird than roasters, or an average of 5 cents per pound more.

This experiment will be continued a few years more before definite conclusions are drawn.

CAPONS—COST OF PRODUCTION

The object of this experiment was to ascertain the total cost of a capon from caponizing until killing. Ten chickens were used in this experiment; they were caponized when 2 months old and killed 156 days later. Not a single bird was lost during caponizing nor afterwards. The following results were obtained: —

CAPONS—COST OF PRODUCTION

Number of birds		10
Initial value	$	4 00
Length of experiment	days	156
Weight at start	lb.	21
Weight at end	lb.	79
Feed consumed	lb.	3.54
Cost of feed	$	9 70
Total cost	$	13 70
Cost per capon	$	1 37

It cost $1.37 to produce a capon for market.

PULLETS VS. HENS FOR EGG PRODUCTION

The object of this experiment is to compare pullets and hens for egg production. All eggs laid during the year by pullets and hens were carefully noted; their value was set at 50 cents per dozen. Feed costs were also taken into account. The results obtained are given in the following table. The cost, in each case, is based upon the production and the feeding of one bird.

PULLETS VS. HENS FOR EGG PRODUCTION

	Pullets	Hens
Number of eggs laid	180	145
Value of eggs laid	$ 7 50	6 04
Cost of feed	$ 3 25	2 75
Profit per bird	$ 4 25	3 29

Feed costs are higher for pullets than for hens, because such costs, for the first year, were computed from birth up. In both cases egg production was reckoned from September, 1929, to September, 1930.

The revenue from pullets was 96 cents higher per bird than from hens. This shows that hens should be kept only for breeding purposes in order to get the most revenue from the flock.

It should be noted however, that the old hens which were used had laid heavily during their first year while the pullets had not as yet been tested. The difference would still be greater in flocks that are not rigorously culled, as it is a well known fact that hens giving a good egg yield during the first year also lay the most in following years.

RELATION OF WINTER PRODUCTION TO FERTILITY, HATCHABILITY AND VIABILITY

The object of this experiment is to ascertain to what extent fertility, hatchability and viability are influenced by winter production.

Eggs laid by hens with varying winter productions were set and a record of incubation was kept in each case.

The period of winter production includes the months of November, December, January and February. The results obtained are shown in the following table:—

RELATION OF WINTER PRODUCTION TO FERTILITY, HATCHABILITY AND VIABILITY

Winter production	Number of eggs set	Number of infertile eggs	Number of dead germs	Number of eggs hatched	Per cent fertility	Per cent hatched	Per cent chicks alive at 3 weeks
1 to 10 eggs	200	11	8	140	94·5	70	97
10 to 20 eggs	190	30	16	103	84·2	54·2	96
20 to 30 eggs	83	9	3	54	89·2	65	95·5
30 to 40 eggs	118	35	1	59	70·4	50	96
40 to 50 eggs	28	14	1	11	50	39·3	98
50 to 60 eggs	44	4	5	19	90·9	45·5	99

The percentage of hatchability was lower for hens having a heavy winter production.

This year, the hens had laid but few eggs during the winter, and they had a marked advantage in fertility and hatchability over birds having laid heavily during the winter, a fact which confirms the theory that hens which have laid well before the hatching period give eggs whose germs are greatly weakened by this heavy production. This advantage was less noticeable last year. This experiment will be carried on a few years more before any conclusions can be drawn.

RELATION BETWEEN DATE OF PRODUCTION OF FIRST EGG AND ANNUAL PRODUCTION

The object of this experiment is to determine the relation, if any, between the date of the first eggs and annual production.

The record of production shows that pullets starting to lay before October 15 are the best producers. Seventy-five per cent of the pullets having laid at least 200 eggs started to lay during the month of October.

As was the case last year, pullets that began to lay between six and seven months of age are those that gave the highest production.

INTESTINAL PARASITES

The object of this experiment is to devise and apply control measures for intestinal parasites, although no symptoms of parasitism have been discovered in our flock.

With this object in view the chicks are never allowed to come into contact with the adult birds. They are reared in colony-houses, moved each year to a new run which has been ploughed and seeded the previous year. Two fields are required for this system. One of these fields is cleaned each year by ploughing and seeding to grass, while the other, which has been ploughed and seeded down the previous year, is used for rearing purposes.

This system of control, which has been in use for several years, gives very good results.

CHEMISTRY

Different varieties of beets were grown on plots measuring $\frac{1}{100}$th acre. They were damaged by cutworms and aphids, which made it impossible to estimate the relative yield. However, samples of each variety were forwarded to the Chemistry Division, Ottawa, for a determination of the sugar content. As in the past, these samples were found to contain a fairly high percentage of sugar; their coefficient of purity was also quite good, but the yield per acre was so poor that the growing of this crop cannot be recommended in this district.

The data which resulted from the chemical analysis of these samples are as follows:—

Laboratory No.	Variety	Sugar in juice	Coefficient of purity	Weight per root
		p.c.	p.c.	
105990	Dippe	20·10	87·04	12·2
91	Fredericksen	19·13	84·16	10·4
92	Rabbethge & Giesecke	19·23	83·89	14·8

The Dominion Chemist reported as follows: These beets were very small, rooty and considerably forked. While the percentage of sugar and coefficient of purity are high, the small amount of juice, size of root and low tonnage preclude the possibility of considering these as a profitable crop for factory purposes.

FIBRE PLANTS

Triplicate plots, each measuring one-sixtieth acre, were seeded with flax (J.W.S. variety) and hemp (Kentucky variety) on May 21. Flax produced a good crop as usual but the yield of hemp was negligible. This is probably due to the lack of available lime in the soil, as hemp requires a great deal of lime.

As usual the flax crop was shipped to Ottawa, to the Division of Fibre Plants, where it was tested to ascertain the quantity value and quality of the fibre. This year's results will be published in the next report; in the meantime, the results obtained during the last few years are given in the following table:—

FLAX—RESULTS OF VARIETY TEST

Variety	Number of years under test	Dry straw per acre	Seed per acre	Retted straw per acre	Total amount of fibre per acre
		lb	bush.	lb.	lb.
Pure line No. 5	1	3,576	.....	1,638	442·8
Longstem	2	4,758	3·0	1,896	592·8
Saginaw	1	3,900	.....	2,076	600·6
Yellow B	1	2,958	.....	1,578	456·0
Riga blue	2	3,639	5·6	1,740	318·0
770 B	1	3,498	.....	1,746	504·0
829 C	1	4,098	.....	2,010	570·0
Holland blue	1	4,500	7·1	.....	

IMPROVEMENTS

CONSTRUCTION.—A handsome poultry administration building was constructed during the summer, as well as an addition to the granary to house the big scales used for weighing the crops of the Station. The upper floor of this building is used as a storage room for exhibition materials, seed grain, and seed-grading machines. A concrete manure platform was also built for manure. These improvements while greatly improving the appearance of the Station, were greatly needed for convenience and will prove very useful.

DRAINAGE AND CLEARING LAND.—A number of ditches were dug, greatly improving the drainage. Eight acres of new land were prepared for sowing in the spring of 1931.

ROADS.—The road bordering the C.N.R. tracks was continued right up to the western limit of the Station, including the building of one mile of new roadway.

EXTENSION AND PUBLICITY

A number of press articles were prepared. A great many visitors were received at the Station, and a large correspondence was handled. Many questions were answered, either verbally or by letter, and numerous copies of bulletins, pamphlets and circulars dealing with different agricultural subjects were distributed.

Members of the staff acted as judges at nearly all the exhibitions and contests held throughout the district. Lectures were given at the various short courses attended by farmers, and at several agricultural meetings.

A number of farms were visited personally by myself or my assistants; assistance was also given in the organizing of an agricultural co-operative association, covering a large part of the Abitibi district. This organization keeps a store for the sale of agricultural products, concentrates, and chemical fertilizers, and also manages a butter and cheese factory.

ILLUSTRATION STATIONS

Four illustration stations, established on farms owned by experienced farmers, are operated under the supervision of the Superintendent of La Ferme. The location of these stations and the names of those in charge are as follows: La Reine, operator Joseph Desrochers; Ste-Rose de Poularies, operator Joseph Lemoine; Barraute, operator Hervé Marcotte; Belcourt, operator Eugène Robitaille. The stations render very useful service in making known the varieties and methods which have given good results on this Station, and it is hoped that their number will be added to in the near future.

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