DOMINION OF CANADA

DEPARTMENT OF AGRICULTURE

DOMINION EXPERIMENTAL FARMS

EXPERIMENTAL STATION

LA FERME, P.Q.

REPORT OF THE SUPERINTENDENT

PASCAL FORTIER

FOR THE YEAR 1924

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EXPERIMENTAL STATION, LA FERME, P,Q.

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THE SEASON, 1924

The monthly mean temperature during the winter of 1924 was relatively warmer than the average for the corresponding period in the six preceding years; the cold was constant, and the fall of snow was noticeably lower than the average for the same period during the six preceding years. The snow disappeared fairly late, some being still on the ground in early May. The lack of rain in April and early May, added to the relatively cold weather, prevented the soil from thawing out at an early date. The first grain was sown on May 13; this seeding was performed in high, well-drained soil, yet there was some frost left in the ground. It was necessary to suspend seeding owing to the moisture present in the thawing soil and to the frequent rains during the latter part of May. Seeding was general by June 9, the season being then three weeks later than normal. June was warm and dry, favouring a rapid seeding.

There were 30.88 inches of rain as compared with 32.84 inches, the average for the six preceding years. During the season of growth from May 1 to September 30, there were 17.36 inches of rain as compared with 16.19, the average for the six preceding years.

There were 1,698.4 hours of sunshine during the year and 971.4 hours during the season of growth (May 1 to September 30) as compared with 1,116.8 hours, the average for the same period during the four preceding years.

The hay crop was the best ever obtained in this district, but it was gathered with much difficulty. Owing to the lateness of the season, much grain again failed to ripen. The snow which fell early in September was very injurious to grain, but the fine October weather completed the ripening.

Fall ploughing was proceeded with up to October 30.

TABLE 1—METEOROLOGICAL RECORDS

EXPERIMENTAL STATION, LA FERME, P.Q., 1924

Month	F. Temperature					Precipitation			Total Hours Sunshine
	Maximum	Date	Minimum	Date	Mean	Rain	Snow	Total	
						Inches	Inches	Inches	
January	32	29	−41	23	−7·1	.....	26	2·60	87·2
February	40	26	−35	19	0·75	.....	14½	1·45	131·6
March	45	22	−11	14	21·0	.....	14½	1·45	75·2
April	62	28	9	5	32·1	0·75	5½	1·30	148·2
May	66	17	19	3	41·1	1·72	4	2·12	156·5
June	75	13	30	2	55·9	1·40	.....	1·40	272·4
July	87	7	39	3–26–31	59·75	4·23	.....	4·23	228·1
August	82	5	37	14–21	59·3	3·47	.....	3·47	181·4
September	77	1	25	22	49·3	6·14	.....	6·14	130·0
October	68	3	20	13	44·6	1·67	3½	2·02	182·0
November	52	1	− 8	16	22·9	0·50	19½	2·45	42·1
December	28	1–3	−40	25	0·8	.....	22½	2·25	60·7
						19·88	110	30·88	1,698·4

TABLE 2—MAXIMUM, MINIMUM AND MEAN TEMPERATURES, 1918–1924

EXPERIMENTAL STATION, LA FERME, P.Q.

	1918			1919			1920			1921			1922			1923			1924		
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
January	22	−44	−5·2	34	−38	4·45	26	−48	−9·62	38	−40	2·72	30	−35	−0·76	29	−39	−6·29	32	−41	−7·1
February	38	−40	−2·6	37	−23	10·34	46	−41	3·46	43	−36	−3·82	34	−25	2·00	30	−41	−6·61	40	−35	0·75
March	54	−35	15·3	50	−30	14·9	58	−20	27·6	57	−25	16·58	48	−16	19·4	42	−31	5·76	45	−11	21·0
April	69	− 4	33·1	68	−13	28·9	57	4	35·8	81	− 1	35·75	57	5	34·05	73	−21	26·6	62	9	32·1
May	79	10	45·3	89	17	49·0	83	29	56·1	90	6	49·03	82	28	52·87	82	2	42·8	66	19	41·1
June	80	20	33·9	94	27	65·1	83	35	58·3	89	29	60·56	89	29	58·43	87	27	56·0	75	30	55·9
July	87	40	63·3	94	34	65·5	82	32	58·4	99	43	69·8	81	37	60·77	86	30	59·8	87	39	29·75
August	82	31	58·5	83	40	59·2	87	33	62·16	83	34	57·86	88	37	59·0	76	33	55·7	82	37	59·3
September	67	30	44·6	72	30	48·3	83	30	54·59	85	31	53·1	79	29	53·3	77	26	51·2	77	25	49·3
October	62	22	39·4	63	14	35·1	70	10	45·34	61	12	38·7	77	12	33·1	67	9	41·1	68	20	44·6
November	49	− 2	28·2	44	−23	21·1	38	−12	19·0	35	− 8	17·03	52	− 6	25·68	50	− 2	27·3	52	− 8	22·9
December	28	−21	9·7	27	−40	−0·5	39	−40	10·23	39	−36	8·9	45	−34	3·23	45	−20	20·5	28	−40	0·8

TABLE 3—PRECIPITATION AT LA FERME STATION 1918-1924

	1918	1919	1920	1921	1922	1923	1924	Average 7 years
	inches	inches	inches	inches	inches	inches	inches	inches
January	1·73	3·45	1·90	1·95	2·00	1·00	2·60	2·09
February	1·58	1·83	1·86	1·20	2·50	1·10	1·45	1·65
March	3·76	3·08	1·25	4·55	0·99	1·87	1·45	2·42
April	0·86	2·96	0·30	2·88	5·68	2·75	1·30	2·39
May	4·23	3·62	1·17	1·15	1·73	1·55	2·12	2·22
June	4·30	1·43	0·81	2·64	2·66	2·86	1·40	2·30
July	4·66	4·14	2·84	2·31	6·24	2·02	4·23	3·78
August	3·15	5·67	3·78	4·58	3·85	5·28	3·47	4·25
September	3·83	5·15	2·71	5·60	0·40	2·78	6·14	3·80
October	3·69	2·96	2·17	1·86	3·56	1·49	2·02	2·53
November	3·59	2·28	0·60	3·31	2·16	0·53	2·45	2·13
December	2·90	3·90	1·98	3·96	3·01	2·90	2·25	2·99
Total	38·28	40·47	21·37	35·99	34·78	26·13	30·88	32·55

ANIMAL HUSBANDRY

Stock raising in this district expanded considerably during the year. With a superabundant production of fodder, the farmers realize that dairying must occupy an important place in the mixed farming system adopted here. Although there are no separate statistics available for the district, it is admitted that the number of animals increased in the proportion of 25 per cent. Two creameries were operated in 1924 and they produced about 17,000 pounds of butter. Two new creameries were built for use in 1925. Three others will be erected in the spring, to be followed by three more that will doubtless be in operation during 1925. Notwithstanding, the butter output from the two creameries, this district imported, during the year, 178,180 pounds of butter valued at $80,181, or $4.74 per capita. There is no reason why the northern Quebec farmer should not secure this market.

As set forth in this report, investigations on animal husbandry occupy an important place in the programme of this Station. It also provides neighbouring settlers and farmers with good breeding stock at moderate prices.

DAIRY CATTLE

On December 31, 1924, the dairy herd included thirty-two head, an increase of seven over the previous year. The pure-bred herd is now composed of four cows, three heifers and one calf, all registered Ayrshires. The grade herd is made up of twelve cows, eight heifers (yearlings and older stuff) and three calves. Both herds are accredited.

The two herds are headed by the Ayrshire bull "Ottawa Lord Kyle 10th No. —86753—," raised at the Central Experimental Farm, Ottawa. He is out of "Spottie No. —69878—" by "Ottawa Lord Kyle 2nd No. —77050—," the latter from "Hairshaw Tibby No. —70082— (49,470)" by "Overton Lord Kyle No. —70090— (18,830)," both imported. He is a very well developed young bull and, it is hoped, will greatly improve the herd.

PRODUCTION OF MILK

Records are kept of the feed given to each cow during the period of lactation as well as the dry period before parturition. The milk from each cow is weighed morning and evening during the whole lactation period and recorded. The milk is also tested once a month as to fat percentage. These data are used to figure the quantity of feed required by an animal for a year, and to find the cost of producing milk.

The cows received the following ration during the winter: 7 to 8 pounds of clover hay, 35 to 40 pounds of O.P.V. silage, and one pound of the following mixture for every four pounds of milk produced: bran, 5 parts; oat meal, 2 parts; barley meal, 2 parts; and linseed cake, 1 part.

Two feeds only are given daily. The silage is fed first and the meal and hay come last. The quantity of hay is based on the animal's appetite, and the quantity given has been found sufficient to keep the herd in good condition. It has been shown that the addition of silage to the ration is very economical as it provides a cheap, succulent feed.

The cows are pastured during the summer and as soon as the grass is hard and scarce, it is supplemented with green feed and a light grain ration. By this means, a nearly constant production is maintained.

The accompanying table shows the quantity of milk produced by each cow that completed her lactation in 1924. It includes the quantity of milk, quantity of feed consumed, value of products and cost of feed. The profit column represents only the comparison between the cost of feed and value of products; it does not include labour, value of calves, interest on capital and depreciation. (Table 4.)

IMPROVEMENT OF A GRADE HERD THROUGH THE USE OF A PURE-BRED BULL

This experiment was started when the Station acquired a herd. Its object is to improve a herd of grade cows and render it more uniform through the use of a pure-bred bull of good breeding.

The first bull used did not, however, influence the last two lots as much as expected. Although the percentage of fat was improved, the quantity of milk was apparently lower. The results obtained to date are shown in table 5.

It would be premature to draw conclusions from this experiment as only one bull was used and the number of females was too limited. "Springbank King Theodore 2nd," the second bull used in this experiment, is out of a cow with a record of 15,178 pounds of milk and 646 pounds of fat. It will be interesting to compare the progeny of this bull with that of the first sire used.

COST OF REARING HEIFERS

The feed consumed by the heifers is recorded from birth to calving, and the figures are used to find the cost of rearing.

The accompanying table (table 6) shows the cost of raising eight heifers from 1919, when the Animal Husbandry division was organized on this Station, to date.

TABLE 4—RECORDS OF MILCH COWS IN 1924

Name of cow	Age at beginning of lactation	Number of days in period of lactation	Total production of milk	Average daily milk production	Average percentage of fat in milk	Value of milk at $3.20 per 100 pounds	Quantity of meal consumed at $35.95 per ton	Quantity of silage consumed at $7.33 per ton	Quantity of roots consumed at $3.66 per ton	Quantity of hay consumed at $22.00 per ton	Quantity of green feed consumed at $7.33 per ton	Pasture at $1 per month	Cost of producing 100 pounds of milk	Total cost of feed	Profit per 100 lbs of milk	Profit or loss per cow, (value manual labour and calf not included)
	yrs mth		lb.	lb.		$ cts.	lb.	lb.	lb.	lb.	lb.	month	$ cts.	$ cts.	$ cts.	$ cts
Nellie		329	9,728	29·5	4·2	311 30	2,889·4	8,890	850	3,025	4,323	2	1 41	137 20	1 79	174 10
Ottawa Mina	4 9	282	4,299	15·2	4·0	137 57	1,629·9	6,704	850	2,583	4,323	2	2 36	101 68	0 84	35 89
Doucette		289	7,974	27·5	3·6	255 17	2,600·9	8,280	850	2,721	4,169	2	1 57	125 87	1 63	129 30
Primrose of Athens	5 4	269	7,162½	26·6	4·4	229 20	1,986·0	10,096	850	2,233	1,884	2	1 53	107 73	1 67	121 47
Primrose of Ottawa	2 11	306	5,567	18·2	4·4	178 14	2,150·1	8,448	850	2,993	4,323	2	2 01	121 93	1 19	56 21
Blanche	2 10	639	7,416	11·6	4·0	237 31	1,837·2	13,694	1,733	3,876	6,086	5½	2 11	156 82	1 09	80 49
Glista	3 9	430	13,001½	30·2	3·4	416 05	3,949·9	11,907	1,973	3,723	4,978	2	1 38	179 44	1 82	236 61
Anna	2 6	358	6,595	18·4	3·8	211 03	1,949·0	7,860	420	2,548	1,975	2	1 54	101 87	1 66	109 16
Daisy "A"	3 9	357	7,856	22·0	4·7	251 39	2,548·0	8,056	850	2,618	2,289	2	1 47	116 07	1 73	135 32
Daisy "B"	3 9	338	5,600½	16·5	4·8	179 22	1,635·0	8,195	855	2,891	3,420	3	1 93	108 36	1 27	70 86
Jumelle	4 10	330	8,727½	26·4	4·1	279 28	2,403·0	8,060	970	3,248	4,255	2½	1 47	128 34	1 73	150 94
Total		3,937	83,977			2,685 66	25,578·4	100,190	11,051	32,459	42,035	27		1,385 31		1,300 35
Average		330·6	7,629	21·4	4·37	244 15	2,325·3	9,108	1,004·6	2,950·8	3,821·4	2·5	1 65	129 45	1 55	114 75

TABLE 5—IMPROVEMENT OF GRADE MILCH COWS

Name of cow	Breed of cow	Number of lactation periods	Age at calving	Average number of days of lactation period	Average quantity of milk	Average daily milk production	Percent Fat	Total Fat	Remarks
					lbs.	lbs.		lbs.	
Daisy	Ayrshire	2	Adult	368	10,039	17·0	4·7	473	Excellent milking qualities. A few Shorthorn characteristics.
			yrs mths						
Daisy A	Ayrshire	1	2 7	315	7,115	22·5	4·8	343	
Daisy A-1	Ayrshire	2	2 10 3 9	345	7,232	21·0	4·7	340	Good heavy cow. Some Shorthorn character.
Doucet	Holstein	3	Adult	293	8,315	28·0	3·6	299	Over three-quarter Holstein blood. Very good cow.
			yrs mths						
Doucet A	X Ayrshire	2	1 9 2 10	516	7,026	13·0	4·0	281	Ayrshire character.
Doucet B	X Ayrshire	1	2 6	388	5,416	14·0	4·1	222	Ayrshire character.
Glista	Holstein	2	2 3 3 9	465	12,625	27·0	3·4	429	Three-quarter Holstein blood. Very good cow.
Glista A	X Ayrshire	1	2 6	358	6,595	18·1	3·9	251	Holstein character.

TABLE 6—COST OF RAISING HEIFERS

Name and number of heifer	Date of birth	Date of calving	Age at calving	Feed consumed								Total cost
				Whole milk at $3.20 per 100 pounds	Skim-milk at 50c. per 100 pounds	Meal at $36.30 per ton	Hay at $22 per ton	Green feed at $7.33 per ton	Silage at $7.33 per ton	Roots at $3.66 per ton	Pasture at 50c. per month	
			mths.	lbs	lbs	lbs	lbs	lbs	lbs	lbs	m.	$ cts.
8 Blanche of La Ferme	Aug. 24, 1919	May 8, 1921	20½	320	1,423	401	2,704	.....	4,771	.....	3½	73 61
9 Belle of La Ferme	June 24, 1920	Dec. 8, 1922	29½	180	937	963	2,067	1,512	9,977	474	7½	97 38
10 Anna of La Ferme	June 4, 1921	Dec. 18, 1923	30½	680	2,020	754	3,189	3,502	7,785	687	7½	127 00
11 Desneiges of La Ferme	May 16, 1921	Feb. 6, 1924	32½	681	2,021	727	3,347	3,502	9,049	687	6½	132 42
12 Emma of La Ferme	May 8, 1921	Feb. 28, 1924	33½	680	2,022	727	3,496	3,502	9,934	687	6½	137 27
13 Rose of La Ferme	Feb. 19, 1922	July 4, 1924	28½	207	2,794	1,037	3,466	2,722	10,036	430	3½	126 84
18 Rita of La Ferme	Dec. 6, 1922	July 7, 1924	18	390	1,362·5	1,172	2,248	1,172	7,449	437	1½	98 44
21 Eva of La Ferme (a)	April 10, 1923	Jan. 2, 1925	21	554	1,680·5	1,062·5	1,838	2,023	6,882	430	3½	100 80
Total	.....	.....	214	3,692	14,260	6,843·5	22,355	17,935	65,883	3,832	40	893 76
Average	.....	.....	26·75	461·5	1,782·5	855·4	2,794·4	2,241·9	8,235·4	479	5	111 72

(a) This heifer calved prematurely.

On the average, the raising of a heifer up to her first calving, when 27 months of age, requires the following: whole milk, 461.5 pounds; skim-milk, 1782.5 pounds; meal, 855.4 pounds; hay, 2794.4 pounds; green feed, 2241.9 pounds; silage, 8235.4 pounds; roots, 479 pounds; and pasture, 5 months. The average cost is $111.72. This figure is very high, but it must be admitted that feed prices have been exceedingly high in the past. In figuring the cost of raising the heifers, the interest on capital, depreciation of equipment and labour are not included.

By figuring the cost of the above quantities of feed according to current prices in his locality, the farmer is able to find the cost of raising a heifer; he will readily see that in order to obtain a profit from his herd, he must keep only heifers out of good milch cows.

If the farmer must keep only heifers out of good milch cows, it is also necessary that he give them a generous quantity of succulent feed, in order that they may attain a maximum development and give the best results. Experiments conducted at the Cap Rouge Experimental Station on the effects of extra-good and average care on size, type and production of mature cows, show without the slightest doubt that good breeding is not sufficient; the animals must be well fed. (Interim Report of the Superintendent, year ending March 31, 1921.) The following method of caring for the heifers is economical and has given good results. The calves are separated from the dam as soon as born. They receive whole milk for the first 3 or 4 weeks; the whole milk is then gradually replaced by skim-milk, until nothing but skim-milk is fed at the age of five weeks. For each pound of skim-milk substituted, one ounce of the following calf meal is added: 6 parts of corn meal, 3 parts of oatmeal, and 1½ parts of ground flax-seed. This mixture is scalded, left standing for some time and then put in the milk. The calves receive skim-milk up to the age of six months. As soon as they can eat, they are given good clover hay in the manger and a small portion of the following mixture of dry grain: 4 parts of bran, 3 parts of oatmeal and 1 part of corn meal. They are kept in the stable during the first year, to protect them from the heat and flies. When a year old, the heifers receive only good clover hay and silage, and they are pastured in the summer. They calve betweeen the age of 2 and 2½ years, and, for some time before freshening, they receive 2 or 3 pounds of the grain ration fed to the milch cows.

HORSES

On January 1, 1924, there were eleven grade draught and two lighter delivery horses at this Station. In the summer of 1924, a mare with her foal, two fillies 2½ and 1½ years of age, and a stallion 2 years of age were received, all of French-Canadian breed. These colts were all sired by "Albert de Cap Rouge No. 1489."

These French-Canadian horses will be used for breeding purposes as the present horses need replacing. Some experimental investigations will also be carried on, such as cost of rearing, maintenance of a brood mare and of a stallion, and an endeavour will be made to find if these horses can adapt themselves to the heavy Abitibi soils.

No investigations have been conducted with draught horses, but an accurate record is kept of the number of hours of labour in each division on the station, and of the cost of the feed consumed.

When working, these horses receive a ration of 16 pounds of hay, 15 pounds of oats and about 3 pounds of bran. This ration has been found sufficient for horses performing medium hard to hard work.

The total number of hours of labour from January 1 to December 31 by an average of 10.8 horses was 21,941 hours, an average per horse of 2,031.6

hours. It is the highest average ever recorded. It is true that during the winter horses were rented for a total of 4,345 hours when they could not be employed otherwise.

From January 1 to December 31, 1924, the following quantities of feed, which was valued at market prices, were consumed by 10.8 horses:—

33·9 tons of hay at $22 per ton	$ 734 80
1973 bushels of oats at $0·534 per bushel	1,053 58
4·75 tons of bran at $27 per ton	128 25
1·3 tons of roots at $3.66 per ton	4 76
215 pounds of rock salt at $0.02 per pound	4 30
Total cost of feed	$ 1,925 69
Average cost per horse	178 30
Average cost of feed per hour of work	8·7 cents

SWINE

On December 31, 1924, there were at this Station eight sows, one boar, twenty-two pigs being fattened and seventeen young pigs, all of Yorkshire breed. Eleven sows farrowed ninety-three pigs of which only sixty lived. They arrived fairly weak, some even stillborn, and many died two or three weeks later. It was noticed that the pigs at this Station suffered from intestinal worms, and an appropriate treatment was applied at once to each pig. For this purpose, the sows received a tablespoonful of Chenopodium oil, three months before farrowing; the same dose is repeated about three days before farrowing. The young pigs are treated when five weeks of age, or as soon as they can eat easily at the trough, and the dose is repeated six weeks later. The dose for the young pigs is one teaspoonful. The pigs must be deprived of food for twelve hours before they receive this remedy, which is mixed with the milk or usual feed.

A fair number of breeding pigs were sold to the members of the Agricultural Society. At a meeting held here at the Station, the directors of the society decided to adopt the Yorkshire breed as the one which is due to give the best service in the district, and contests were organized to encourage the development of the bacon type and to create a breeding centre.

COST OF REARING SWINE

The feed required for the maintenance of five sows from which eight litters have been obtained (a few of them having farrowed twice) has again been compiled. The period from weaning to farrowing covers 7½ months.

FEED COST OF FIVE SOWS (WEANING TO FARROWING) FOR 7½ MONTHS

11,952 pounds of meal at $33 per ton	$ 197 20
1,904 pounds of roots at $3.66 per ton	3 48
1,378 pounds of skim-milk at 50 cents per 100 pounds	6 89
Total	$ 207 57

FEED COST FROM PARTURITION TO WEANING, INCLUDING THE FOOD OF THE YOUNG PIGS

3,051 pounds of meal at $34.25 per ton	$ 52 25
1,776 pounds of milk at 50 cents per 100 pounds	8 88
Total	$ 61 13
Total cost of eight litters (40 pigs) raised to 8 weeks	$ 268 70
Average cost per pig	6 72

FEED COST OF TWENTY-FIVE PIGS FROM EIGHT WEEKS TO EIGHT MONTHS OLD, WHEN BRED

7,467 pounds of meal at $37.60 per ton	$ 140 38
7,295 pounds of milk at 50 cents per 100 pounds	36 48
Total	$ 176 86
Average cost per pig	$ 7 07

SUMMARY OF FEED COST OF PIG AT EIGHT MONTHS OF AGE

Average feed cost of pig at 2 months of age including feed of sow and young pigs	$ 6 72
Average cost per pig from weaning to 8 months of age	$ 7 07
Total	$ 13 79

These pigs are in perfect condition. The feed costs will be recorded until two sows have farrowed, in order to find the average cost for one sow. The average cost per pig at eight weeks of age is relatively high, but this is due solely to the worms which affected them, as mortality was very high.

COMPARISON OF BARLEY MEAL AND CORN MEAL FOR FATTENING OF PIGS

The object of this experiment is to compare the value of barley meal and corn meal in the fattening ration.

Twenty pigs were divided into two equal groups for this experiment. The first group received the following ration: 1 part of oatmeal; 1 part of corn meal; 1 part of middlings; and ½ part of linseed oil cake.

The second group received a similar ration, except that the corn meal was replaced by barley meal.

The results are given in the following table:—

TABLE 7.—BARLEY AND CORN MEAL FOR FATTENING RATION

Number of Group		1 Corn meal	2 Barley meal
Number of pigs in each group		10	10
Initial weight	lbs.	1,221	1,176
Average weight of each pig	"	122	117
Final weight of each group	"	1,696	1,705
Final weight of each pig	"	169·8	170·5
Total increase in each group (40 days)	"	475	529
Average daily increase per group	"	11·9	13·2
Average daily increase per pig	"	1·19	1·32
Feed consumed			
Meal ration consumed per group	lbs.	2,261	2,415
Average daily ration per group	"	56·5	60
Average daily ration per pig	"	5·65	6
Quantity of meal required per 100 pounds of increased weight	"	476	456
Quantity of meal required for one pound of increased weight	"	4·76	4·56
Cost of feed per group	$	57 88	57 23
Cost of 100 pounds of increased weight (labour not included)	$	12 17	10 82

The results obtained in 1921 with a similar experiment showed that the cost of producing 100 pounds of increased weight was $13.25 for corn meal and $13.78 for barley meal, but the latter was estimated at the same price as the former. The average figures for both years are: $12.71 for corn meal and $12.30 for barley meal.

The difference in favour of barley meal this year is explained by the fact that the pigs had a better appetite and consumed nearly half a pound of meal more each day than group No. 1. This experiment will be continued for another year, to obtain more conclusive results. It must be noted, however, that the barley was valued at the market price, $40 per ton, which is greatly in excess of the cost of production and which leaves a very wide margin of profit to the producer. The farmers would therefore, be well advised to sow more barley.

SHEEP

The flock now includes twenty ewes, fourteen ewe lambs and one ram of pure Cheviot breeding, as well as ten grade ewes. The grade ewes kept at this Station early in the year were largely disposed of in the fall for slaughter, although a few were sold for breeding purposes. Five grade ewes were retained in order to continue the experiment concerning the improvement of the flock through the use of a pure-bred ram; the object being to confirm the results obtained with the first ram used, as those from the second ram were negative. This experiment is now under way and the results will be published as soon as available.

The pure-bred flock is headed by "Monarch-1430", a ram imported from Scotland.

The 1924 lamb crop was exceptionally satisfactory. Thirty lambs were obtained from the sixteen ewes which were bred in 1923, a 187.5 per cent production. The lambs were all strong at birth and none died. These records refer to pure-bred ewes only.

BREEDING OF EWE LAMBS

The experiment was dealt with in the report for the year 1923, and was continued in 1924. As explained in the report for that year the object of this experiment was to determine if it might be advisable to breed ewe lambs at the age of seven to eight months, so that they might lamb when they are one year old. Six of the best ewe lambs born in 1921, eight in 1922, and six in 1923 were used in this experiment. Twelve ewe lambs born in 1921 and six in 1922 were kept as checks; these ewe lambs were to be mated at the age of eighteen to twenty months, so as to lamb when two years old. The ewe lambs were weighed at the age of 6 months and at each of the following seasons. The number of lambs born and the weight at birth, as well as the number of lambs that died, were recorded. The results to date are shown in the accompanying tables 8 and 9

SUMMARY.—The following table (table 10) shows the average for the fourteen ewes bred at the age of 8 to 8½ months (group No. 1) that gave two crops of lambs, and those bred at the age of 19 to 20 months (group No. 2) that gave only one crop of lambs. This experiment covers a period of three years, from 1921 to 1924.

TABLE 8.—EWE LAMBS BRED AT THE AGE OF EIGHT AND EIGHT AND A HALF MONTHS

——	Date of birth	Weight of mothers			Lambs born the first year					Lambs born the second year				
		Six months old	One and a half years old	Two and a half years old	Date of dropping lamb	Number of lambs	Number dead	Per cent of mortality	Weight at birth	Date of dropping lamb	Number of lambs	Number dead	Per cent of mortality	Weight at birth
									lbs.					lbs.
Claire of LaFerme.....No. 34	1921	110	118	138	27-4-22	1-F	.....	.....	7	30-3-23	2-F-M	1	.....	8
Catherine of LaFerme...No. 36	1921	111	120	128	26-4-22	1-F	.....	.....	6	21-3-23	1-F	.....	.....	9½
Cunégonde of LaFerme..No. 44	1921	109	115	136	21-4-22	1-M	.....	.....	7	31-3-23	1-F	.....	.....	9
Caroline of LaFerme.....No. 45	1921	110	120	128	23-4-22	1-M	.....	.....	9	13-4-23	1-M	.....	.....	13
Charlotte of LaFerme...No. 48	1921	107	138	154	21-4-22	2-M	2	.....	.....	23-3-23	2-M-F	1	.....	8
Colombine of LaFerme..No. 30	1921	107	114	126	21-4-22	1-M	.....	.....	8	16-4-23	1-F	.....	.....	6½
(a)Dorothée of LaFerme.No. 92	1922	55	91	118	.....	.....	.....	.....	.....	30-4-24	1-M	1	.....	.....
(b)Dora of LaFerme.....No. 89	1922	75	116	125	24-4-23	1-M	1	.....	.....	8-4-24	1-M	.....	.....	9
Desneiges of LaFerme...No. 65	1922	110	161	176	7-4-23	1-M	1	.....	.....	12-4-24	2-F-M	.....	.....	5½-6
Daphnée of La Ferme....No. 54	1922	101	141	153	13-4-23	1-M	.....	.....	10	26-3-24	2-M	2	.....	.....
Delphine of LaFerme....No. 62	1922	95	114	130	15-4-23	1-M	.....	.....	6	5-4-24	1-M	.....	.....	9½
Deidonnée of LaFerme..No. 58	1922	92	136	144	15-4-23	1-M	.....	.....	5½	10-4-24	1-F	1	.....	.....
Denise of LaFerme.....No. 57	1922	98	126	134	16-4-23	1-M	.....	.....	9½	8-4-24	1-M	.....	.....	10
Dardanelle of LaFerme..No. 85	1922	95	111	118	3-6-23	1-F	.....	.....	4½	12-4-24	1-F	.....	.....	9
Average for 2 years.....	.....	98·9	122·6	131·1	.....	14	4	28·6	7·2	.....	18	6	33·3	8·5
(c)Eveline of LaFerme..No. 131	1923	55	.....	.....	.....	.....	.....	.....	.....	Did not lamb.				
Euphrosine of LaFerme.No. 125	1923	70	.....	.....	17-5-24	1-M	.....	.....	6					
Emélia of LaFerme.....No. 110	1923	126	.....	.....	14-4-24	1-M	.....	.....	8					
Europe of LaFerme.....No. 77	1923	94	.....	.....	.....	.....	.....	.....	.....	Did not lamb.				
Eudoxine of LaFerme...No. 121	1923	116	.....	.....	.....	.....	.....	.....	.....	Did not lamb				
Elmire of LaFerme.....No. 108	1923	111	.....	.....	22-4-24	1-F	.....	.....	6					
Elmira of LaFerme.....No. 107	1923	116	.....	.....	10-5-24	1-F	.....	.....	5½					
Average.....	.....	98·3	.....	.....	.....	4	.....	.....	6·4					

(a) Daughter of Claire de LaFerme No. 34
(b) Daughter of Catherine de LaFerme No. 36.
(c) Daughter of Dardanelle de LaFerme No. 85.

TABLE 9.—EWE LAMBS BRED AT THE AGE OF NINETEEN TO TWENTY MONTHS

Name and number	Weight of mothers			Lambs born of 2-year-old ewes				
	Six months old	One and one-half years old	Two and one-half years old	Date of dropping lamb	Number of lambs	Number dead	Per cent dead	Weight at birth
	lbs.	lbs.	lbs.					lbs.
Ewe lambs, born in 1921—								
Cécile de LaFerme....No. 41	109	145	151	27-3-23	1-M	.....	.....	9½
Cérès de LaFerme....No. 42	89	117	124	28-3-23	1-F	.....	.....	8
Cesarine de LaFerme.No. 32	85	114	126	23-3-23	2-M-M	.....	.....	6-5
Chloris de LaFerme..No. 46	91	126	141	30-3-23	1-M	.....	.....	9
Christine de LaFermeNo. 38	103	128	121	11-4-23	1-M	.....	.....	7½
Cibèle de LaFerme...No. 35	93	122	116	14-4-23	1-F	.....	.....	8½
Clara de LaFerme....No. 40	82	119	114	31-3-23	1-F	.....	.....	8½
Claudine de LaFerme.No. 31	95	128	136	11-4-23	2-F-F	.....	.....	7-7½
Clémentine de La-Ferme.....No. 49	109	148	144	28-3-23	2-F-M	.....	.....	8-7
Chloée de LaFerme...No. 47	113	158	161	21-3-23	1-M	.....	.....	10
Cordélia de LaFerme.No. 37	80	106	106	26-3-23	1-M	.....	.....	9½
Corinne de LaFerme..No. 33	104	143	176	5-4-23	1-M	.....	.....	5½
Ewe lambs born in 1922—								
Diane de LaFerme....No. 67	61	114	129	30-3-24	1-F	.....	.....	9
Dionée de LaFerme...No. 68	58	94	120	11-4-24	1-F	1	.....	.....
Dircée de LaFerme...No. 72	77	121	135	8-4-24	1-M	.....	.....	8
Djamma de LaFermeNo. 73	70	96	127	7-4-24	2-M	1	.....	7
Djennie de LaFerme..No. 76	72	91	118	.....	.....	.....	.....	.....
Dolorès de LaFerme..No. 84	70	124	137	7-4-24	1-F	.....	.....	9
Average, 2 years.....	86·7	121·9	132·3	.....	21	2	9·5	8

TABLE 10.—SUMMARY—LAMBING AT ONE YEAR OF AGE *vs* TWO YEARS OF AGE

—	Group 1	Group 2
	Ewe lambs served at the age of 8 to 8½ months	Ewes served at the age of 19 to 20 months
Number of ewe lambs	14	17
Average weight at 6 months..... lbs.	98·9	86·7
Average weight at 1½ years..... "	122·6	121·9
Average weight at 2½ years..... "	131·1	132·3
Number of lambs produced	32	21
Lamb production per 100 ewes bred	228·57	123·53
Number of lambs that died 3 days after birth	10	2
Lamb production per 100 ewes bred—living lambs	157·1	111·7
Percentage of mortality	31·25	9·5

As a ewe lamb in group No. 2 did not lamb owing to what was considered to be accident, she was not included in the average. The number of living lambs produced by group No. 1 exceeds that of group No. 2 by 45.4 per cent, but the mortality in the former was 21.75 per cent higher than in the latter group.

The ewe lambs served in 1923 (when 8 to 8½ months old) gave a first crop of only 6.6 per cent, two of them failing to lamb. There, however, was no mortality.

It was noted that the lambs produced by group No. 1 (lambing at one year of age) were much smaller, and in two cases, it was impossible to have the female progeny bred at the same age as were the mothers; while in another case, the lamb died at birth.

CONCLUSIONS.—It might be deduced that the mating of ewe lambs at eight months has little influence on their size if they are well fed. Ewe lambs may be mated at that age if they are well developed, but in most cases it is not advisable to have their ewe lamb progeny bred at the same age, for lambing is often delayed and the ewe lambs are consequently too thin in the fall. The rations of these ewe lambs must be succulent and substantial.

BARLEY VS. CORN FOR MARKET-LAMB FEEDING

The object of this experiment was to compare barley meal with corn meal for lamb fattening in the fall. The results are given for the years 1923 and 1924.

Twenty-two grade (castrated) lambs were taken in 1923, and twenty-four in 1924; in each instance, they were divided into two groups of equal weight and number. The first group received the following grain ration: Oat meal, 2 parts; bran 2 parts; corn meal, 1 part; linseed cake, 1 part. The second group received the same ration, less the corn meal which was replaced by barley meal.

The average results for the two years are shown in the following table:

TABLE 11.—BARLEY *vs* CORN

		1 Corn meal	2 Barley meal
Number of lambs in group		23	23
Total weight at beginning of fattening period	lbs.	2,035	2,034
Total weight upon completion of fattening period	"	2,272	2,217
Total gain during the period (28 days)	"	237	183
Average weight at beginning of fattening period	"	88·5	88·4
Average weight upon completion of fattening period	"	98·7	96·4
Average gain per lamb (28 days)	"	10·2	8·0
Food consumed			
Hay at $22 per ton	lbs.	1,123	1,123
Silage at $7.33 per ton	"	1,307	1,307
Corn ration at $39.70 per ton	"	1,123	.....
Barley ration at $36.36 per ton	"	.....	1,123
Average grain ration per lamb	"	48·8	48·8
Average grain ration per lamb per day	"	1·74	1·74
Quantity of meal required per 100 pounds of increased weight	"	473·84	613·66
Quantity of meal required per pound of increased weight	"	4·74	6·14
Cost of feed per group (labour not included)	$	39·43	37·56
Cost of producing 100 pounds of increased weight (labour not included)	$	16·63	20·52

The two-year average indicates that corn is superior to barley. The whole difference in the gain comes from the first year, when group 1 gained 58 pounds over group 2. The results for 1924 were contradictory, as group 2, which was fed the barley meal, gained 4 pounds over group 1. The experiment will be continued.

The lambs were shipped to Montreal, graded No. 1, and sold as frozen lamb at the price of 18 cents per pound.

FIELD HUSBANDRY

Seeding was about three weeks later than the average for the preceding years, but there was a better distribution of rainfall; as a result, growth was rapid, and those who sowed an early variety of oats obtained ripe grain. The grain was sown on May 17, but the grounds was still frozen and when it began to thaw out, seeding had to be postponed until the first days in June. The hay crop was by far the best ever obtained at this Station. Sunflowers and roots did not give a very good yield owing to the excessive moisture in certain cases and to the cold. These crops also suffered a little from the July frost as did the potatoes. The oats sown in May ripened well, but those sown after June 10 did not ripen. The first barley seedings gave a satisfactory yield, but the crop from the last ones was mediocre.

COST OF PRODUCTION OF CROPS

In all cultural and rotation experiments and in the cost of production of different crops, the following values were used for 1924:—

COST VALUES

	$ cts.
Labour, per hour	0 30
Horsepower, per hour	0 10
Rent, of land per acre	4 50
Use of machinery, per acre	3 00
Farm manure (cost of spreading, $1; value of manure, $1) per ton	2 00
Nitrate of soda, per ton	98 00
Acid phosphate, per ton	48 00
Seed, oats, per bushel	1 35
" wheat, per bushel	2 75
" barley, per bushel	2 00
" buckwheat, per bushel	2 00
" Swede turnips, per pound	0 55
" corn, per pound	0 09
" O.P.V. mixture, per bushel	6 32
" Sunflower, per pound	0 14
" red clover, } Total cost to be divided among the number of years in hay and pasture.	0 28
" alsike, }	0 16
" timothy, }	0 16
" potatoes, per bushel	1 50
Twine, per pound	0 15
Threshing, per bushel	0 07
Ensilage, per ton	0 68

RETURN VALUES

Barley, per bushel	1 30
Oats, per bushel	0 58
Oats, when cut for ensilage, per ton	5 33
Hay, per ton	16 00
Ensilage, per ton	5 33
Small potatoes, per ton	4 00
Potatoes, per bushel	0 87
Straw, per ton	6 40

COST FOR PRODUCING OATS

Twenty-eight acres were sown in Banner oats for grain from May 17 to June 12, but only those sown in May on the three acres ripened. These oats ripened very well and were accepted as registered seed. They were harvested on September 24 and stored on October 3. This seed will be cleaned and kept for spring sowing.

The cost of production of oats is as follows:—

Total cost per acre	$ 24 04
Yield of grain per acre	33·3 bushels
Yield of straw per acre	1·43 tons
Cost per bushel of grain	$ 0·546
Cost per ton of straw	$ 4 05

COST OF PRODUCING BARLEY

Nine acres were sown in barley from June 10 to 15 for cultural experiments. The barley was sown at the rate of two bushels per acre on fall-ploughed land, previously in oats. The crops were cut during the last days of September. The grain was of good quality but the yield was not high.

Total cost per acre	$23 69
Yield of grain per acre	16·2 bushels
Yield of straw per acre	0·75 ton
Cost per bushel of barley	$ 1·193
Cost per ton of straw	$ 5 86

COST OF PRODUCING OATS, PEAS AND VETCHES

Fifty-one acres were seeded in June at the rate of two bushels of oats, three-quarters of a bushel of peas and one quarter of a bushel of vetches. This green feed mixture was partly sown in land cleared the previous year. Part of this

land was a heavy clay and the remainder was covered with a thick layer of moss. It required much labour to prepare it, and still it was not satisfactory. The yield varied from 1.5 to 5.85 tons per acre. The cost of production is as follows:—

Cost per acre	$22 08
Yield	2·55 tons
Cost per ton	$ 8 66
Value per acre at $5.33 per ton	$13 59
Loss per acre	$ 8 49

This mixture makes an excellent ensilage. It was mixed with green oats and sunflowers.

COST OF PRODUCING SUNFLOWERS

As the sunflower yield was not high and frost injury occurred, the cost of production is not given. The cost was compiled, however, for the rotation experiments. The cost of production in these rotations varies from $8.77 to $24.20 per ton.

COST OF PRODUCING HAY

A little over 218 tons of hay were cut in 1924 on an area of 111.5 acres, the crop being the largest ever obtained at this Station. Owing to the cold and drought, growth was delayed until fairly late in June and gave promise of a poor crop, but the mid-June and July rains gave renewed strength to the hay. Cutting was very late as compared with the preceding years. There were delays also due to frequent rains at haying time; owing to these rains, the hay was not all of first quality. The first cut was made on July 25, and storing was not over before August 18. The yields per acre varied between 1 ton and a little over 3.75 tons. The cost of production is as follows:—

Total cost per acre	$13 39
Yield per acre	1·96 tons
Cost per ton	$ 6 83
Total value of yield per acre at $16 per ton	$31 36
Profit per acre	$24 53

The clover and grass mixture used per acre was formerly composed of twelve pounds of timothy, eight pounds of red clover and two pounds of alsike clover. As alsike clover grows extremely well in this section and seems to come along better than red clover, two pounds of red clover were taken out and the alsike clover seed increased by the same quantity.

On account of the heavy crop of this year, the price of hay fell from $22, last year's figure, to $16 per ton, notwithstanding the 25 per cent increase in the live stock. It is a sure sign that the crop nearly suffices for the needs of the district, and it is a warning that it will be necessary to increase live stock in proportion to the production of hay, for as stated in a previous report, the exporting of hay is out of the question owing to prohibitive freight costs.

ENSILAGE CROPS VS ROOT CROPS

The object of this experiment is to compare the yields of fodder corn, sunflowers, and a mixture of oats, peas and vetches for ensilage with the yields from mangels and swede turnips.

The corn and sunflowers were sown with the seed drill at the rate of twenty-eight and eight pounds respectively per acre, in rows 42 inches apart. The O.P.V. mixture included two bushels of oats, three-quarters of a bushel of peas and a quarter bushel of vetches, sown at the rate of three bushels per acre. The swede turnips and mangels were seeded on ridges, the former at the rate of four pounds per acre and the second at the rate of eight pounds. Both the turnips and mangels failed entirely, none being harvested.

The corn was entirely frosted again this year, and sunflowers did not grow as well as usual. On the other hand, the mixture of oats, peas and vetches gave a good yield. Silo owners would be well advised to produce this crop.

ROTATIONS

The object of these rotations is to find out the following: —

1. The value, if any, of a short rotation in restoring the fertility of the soil.
2. The effect of a one, two, or three-year old sod on the crops following.
3. The yield of hay for one, two or three years.
4. The yield of sunflowers after grass or grain, or after clover or grass sod.
5. The yield of grain after: (*a*) sunflowers, (*b*) hay, (*c*) grain.
6. The advantage of different rotations including various crops in different proportion.
7. The value of potatoes as a cash crop.

The advantages that may result from the use of these rotations may be classified as follows: —

1. The land may be prepared for the growing of a crop one or more years before this plant is actually grown.
2. The rotation may be arranged so as to meet the special requirements of the system of farming that is followed.
3. The use of special rotation makes it easier to control or even to destroy completely some weeds.
4. Many plant diseases may be controlled or extirpated by the use of certain rotations.
5. The fertility of the soil may be maintained as well as gradually increased through the supply of humus by adopting well-planned rotations and by good use of clover and manure.
6. A more systematic programme of farm work may be prepared, thus eliminating unnecessary work and fences.
7. It is generally possible to keep the land in better condition, thus increasing the yield.

The following rotations were started in 1923. They should meet the requirements of the district.

THREE-YEAR ROTATION

This rotation should meet the needs of those who have much rough pasture. It is splendidly adapted for the extirpation of weeds.

First year.—Hoed crop. The land is ploughed the previous fall and 12 tons of manure are applied per acre.

Second year. — Grain seeded down with 6 pounds of timothy, 8 pounds of red clover and 4 pounds of alsike clover.

Third year. — Clover hay cut early, before the weeds have ripened. The land is ploughed soon after and cultivated the rest of the season.

FOUR-YEAR ROTATION

This rotation may be suitable for the raising of live stock as it produces more hay than the first one.

First year. — Hoed crop. Sixteen tons of manure per acre are spread on the land ploughed the preceding fall.

Second year. — Grain, seeded down with 12 pounds of timothy, 6 pounds of red clover and 4 pounds of alsike clover.

Third year. — Clover hay.

Fourth year.—Timothy hay. As soon as the hay is cut, the land is ploughed and cultivated the rest of the season.

FIVE-YEAR ROTATION

This rotation gives as much hay as the preceding one, and more grain.

First year. — Grain, sown at the rate of 2½ bushels per acre and ploughed in the fall.

Second year. — Hoed crop, manured on the stubble the preceding fall at the rate of 12 tons of manure per acre.

Third year. — Grain seeded down with 12 pounds of timothy, 6 pounds of red clover and 4 pounds of alsike clover.

Fourth year. — Clover hay.

Fifth year.—Timothy hay with an application of 6 tons of manure per acre as a covering.

SIX-YEAR ROTATION

This rotation gives a great deal of grain, besides giving three crops of hay. It would be very suitable for dairying.

First year. — Hoed crop manured the preceding fall on the fall-ploughed land, at the rate of 16 tons of manure per acre.

Second year. — Grain.

Third year. — Grain seeded down with 12 pounds of timothy, 6 pounds of red clover and 4 pounds of alsike clover.

Fourth year. — Clover hay manured at the rate of 8 tons of manure per acre.

Fifth year. — Timothy hay.

Sixth year.—Timothy hay.

Although the rent of land valuation was increased by 65 cents per acre, the manure estimated at $1 per ton more that last year, and the value of hay was $6 per ton less, these rotations showed a very great decrease in the loss or gain column. The yields will not be at their maximum before these crops have completed a whole cycle.

LAND CLEARING

During the year, twenty-eight acres were stumped, and the stumps piled. It was impossible to burn this pile on account of the extremely wet weather in late August and September. This last operation, as well as the picking up of the roots, will be performed in the spring as soon as the weather will permit; if possible the land will be sown to oats, peas and vetches. The cost of clearing will be given upon completion of the work.

HORTICULTURE

Although 1924 was not the worst year for horticulture, neither was it the most favourable. There were no summer frosts, but the season was comparatively cold.

APPLES

The apple trees came through the winter of 1923-24 very well, and some of the trees made a growth of twenty-four inches. Nearly all the trees which had been injured during the 1922-23 winter gave a new growth that was satisfactory. A few varieties bloomed again this year, but no fruit set.

SMALL FRUITS

The currant, gooseberry and raspberry bushes bloomed in the spring of 1924, but with the exception of black currants, gave practically no fruit. The new plantation made in 1923 gave a satisfactory growth and it should yield a good crop next year, judging by the development of the bushes.

VEGETABLES

BEANS

VARIETY TEST.—Nineteen varieties were sown on June 2 in rows thirty feet long. Although there were no frosts, they suffered from the cold, and anthracnose was greatly favoured by the moisture; however, a few varieties were but lightly affected. When the first heavy frost arrived, on September 24, the plants were still loaded with pods. The yields are tabulated. (Table 12.)

TABLE 12—BEANS—TEST OF VARIETIES

Varieties	Source of seed	Number of days from sowing until ready for use	Yield per acre
			lb.
Masterpiece	0-2746	111	3,630
Davis White Wax	0-2772	111	3,521
Plentiful	Sutton	116	3,456
Ex. Ey. Valentine	0-1479	115	3,340
Bountiful Green Bush	D. & F.	113	3,194
Wardwell Kidney Wax	McDonald	111	2,468
Bountiful Green Bush	0-2825	113	2,214
Yellow Eye Yellow Pod	0-2821	111	2,214
Stringless Green Pod	0-2747	111	1,889
Challenge Black Wax	0-592	108	1,779
Davis Wax	McDonald	111	1,779
Wardwell Kidney Wax	0-2823	111	1,462
Pencil Pod Black Wax	Burpee	111	1,452
Round Pod Kidney Wax	0-5232	116	1,089
Plentiful French	0-2824	111	1,030
Refuge or 1000 to 1	0-1631	134	726
Round Pod Kidney Wax	McDonald	116	617
Refuge or 1000 to 1	S.B.	138	581
Kentucky Wonder Wax (Pole)	Will	133	290

The following varieties were very late and did not bear:—

Hodson Long Pod	Rennie
Dwarf French or Bountiful	Shell
Hodson Wax	Harris
Hodson Long Pod	0-2748
No. 1 White Pole	0-5964

The varieties which were not much affected by anthracnose are:—

Round Pod Kidney Wax	McDonald
Davis Wax	McDonald
Plentiful French	0-2824
Bountiful Green Pod	0-2825
Extra Early Valentine	0-1479

DISTANCE OF PLANTING IN ROW.—The object of this experiment is to find if it is advantageous to plant beans at a distance of 2, 4 or 6 inches in the row, with regard to yield and earliness. The results of one year only show that the interval affects the yield, but not the earliness. Two varieties were sown on June 2 in connection with this experiment. The results obtained are given in the accompanying table.

TABLE 13—INTERVALS FOR PLANTING BEANS

Varieties	Date of sowing	Date ready for use	Yield per acre		
			Two inches	Four inches	Six inches
			pints	pints	pints
Stringless Green Pod	June 2	Aug. 25	5,583	4,937	3,270
Round Pod Kidney Wax	June 2	Aug. 25	1,947	1,666	1,947
Average			3,765	3,301	2,608

LENGTHENING THE SEASON.—The object of this experiment is to compare the planting of an early variety at different dates with plantings of early, medium, late and extra-late varieties at the one time, in order to find which plan is preferable in securing a continuous production. The results are as follows:—

TABLE 14—BEANS—LENGTHENING THE SEASON

Varieties	Season of variety	Date of sowing	Date ready for use	Yield per acre
				lb.
Refugee	Very late	May 23	Sept. 13	175
Extra Early Valentine	Late	May 23	Aug. 26	2,862
Stringless	Medium	May 23	Aug. 26	2,949
(a) Round Pod Kidney Wax	Early	May 23	Aug. 26	(a) 348
Round Pod Kidney Wax	Early	June 7	Aug. 26	2,091
Round Pod Kidney Wax	Early	June 17	Aug. 26	.....
Round Pod Kidney Wax	Early	June 23	Aug. 26	.....

(a) 87 per cent of the plants failed to grow.

Total yield for the four varieties..... 6,334 lbs.
Total yield for two seedings..... 2,439 lbs.

As the season for beans is none too long already, it would seem useless to make a late sowing of early varieties; nor is it advisable to sow late varieties. When the first frost occurred, in September, these beans were all producing heavily and in fact, they had not reached their maximum production. The latest variety and the two sowings made on June 17 and 23 had produced little or nothing at that date. Past experience shows that early or medium varieties should be used.

BROAD BEANS

VARIETY TEST.—Eighteen varieties were sown on May 23, in rows thirty feet long and two and a half feet apart. These plants stand very heavy frosts and promise to be of great value in nothern Quebec. They provide a considerable quantity of fodder. The number of pounds of green feed are stated in table 15, next to the number of pounds of green pods.

It is interesting to note the quantity of fodder given by these beans. The best yield is much superior to that ever obtained from sunflowers or any other fodder.

TABLE 15—BROAD BEANS—VARIETY TEST

Variety	Source of seed	Number of days from sowing until ready for use	Yield per acre, green pods	Yield per acre, green fodder	Average for two years, green fodder
		days	lbs.	lbs.	lbs.
Long Pod Hang Down	Sharpe	131	14,520	7,550	20,918
Long Pod Johnson Wonder	"	131	13,358	8,422	23,668
Windsor Giant four-seeded	"	131	11,616	8,712	21,489
Windsor Broad Taylor	"	131	11,035	16,262	26,139
Windsor Harlington	S.B.	131	9,292	27,878	29,040
Windsor Green	Sharpe	131	9,292	16,843	29,330
Long Pod Masterpiece Green	"	131	8,712	15,101	27,007
Long Pod Early	"	131	8,712	16,262	25,273
Long Pod Monarch	"	131	7,841	13,358	27,732
Long Pod Conqueror	"	131	7,550	11,616	22,951
Windsor Common	"	131	7,550	12,197	18,586
Long Pod Green	"	131	7,550	11,616	25,555
Long Pod Seville	"	131	6,970	8,712	13,408
Long Pod Aquadulce	"	131	6,098	7,550	10,744
Long Pod Bunyard Exhibition	"	131	5,808	16,262	27,738
Beck Green Gem	"	131	4,696	5,808	12,778
Early Mazagan	"	131	4,066	13,939	21,489
Dwarf Fan or Cluster	"	131	4,646	6,389	15,682

BEETS—VARIETY

VARIETIES.—Eight varieties of beets were sown on June 14 in rows thirty feet long and thirty inches apart. The plants were thinned to three inches in the row.

TABLE 16.—BEETS—VARIETY TEST

Varieties	Source of seed	Days from seeding until ready for use	Average number of days for two years	Yield per acre	Average yield for two years
				lbs.	lbs.
Eclipse	McDonald	89	105·5	12,342	11,398
Crosby Egyptian	S.B.	103	112·5	10,164	10,019
Columbia	Burpee	101	111·5	10,164	9,147
Detroit Dark Red	McDonald	103	.....	9,583	.....
Detroit Dark Red	Graham	89	.....	8,712	.....
Detroit Dark Red	0-3494	103	.....	6,679	.....
Sunnybrook	Burpee	101	.....	5,227	.....
Black Red Ball	Burpee	108	115	3,775	5,307

For 1924 and the two-year average, the Eclipse variety is first with an average yield of 11,398 pounds per acre; the Crosby Egyptian variety follows closely with 10,019 pounds per acre. Both varieties are of good quality.

THINNING TEST.—The Detroit Dark Red variety was sown on May 14, on a hundred-foot row, being one of several rows thirty inches apart. One third of the row was thinned to two inches, one third to three inches, and another third to four inches. The results for 1924 and the average for three years are shown in the accompanying table.

TABLE 17.—BEETS—THINNING TEST

Year	Date of Sowing	Thinned to 2 inches Yield per acre	Thinned to 3 inches. Yield per acre	Thinned to 4 inches. Yield per acre
		lbs.	lbs.	lbs.
1921	.....	28,456	22,176	12,672
1922	May 16	4,224	3,320	1,056
1924	May 14	11,341	10,310	18,042
Average for 3 years	.....	14,673·3	11,935·3	10,590

DATES OF SOWING.—One row, 30 feet long, of the variety Detroit Dark Red was sown as soon as possible in the spring, and also every ten days thereafter, the rows being 30 inches apart. One-half of the row was harvested whenever the plants were ready for the market, while the other half was harvested at the end of the season. The green crops, as well as the crop at the end of the season, are compiled for an area of half an acre. The part of the row which was to be harvested at the end of the season was flooded by water from a blocked drain. The best basis of comparison in connection with the date of sowing is the "total per acre" column. The results are shown in table 18.

Although it is not wise to judge by the results of one year only, this experiment shows that the second date of sowing gave a better yield than the first, and that the green crop was ready to use as soon as the first. The two last sowings gave unmarketable plants only.

TABLE 18.—DATES OF SOWING BEETS

Date of sowing	Early crop on ½ acre				Harvested end of season, ½ acre				Total per acre	
	Marketable			Unmarketable	Marketable			Unmarketable	Bunches	Number of pounds
	Date ready for use	Number of bunches	Number of pounds	Number of pounds	Date of harvesting	Number of bunches	Number of pounds	Number of pounds		
May 14	Sept 15	2,323	3,940	290	Oct. 3	1,742	2,323	726	4,065	6,263
" 26	" 15	4,066	5,227	290	" 3	2,323	3,485	286	6,389	8,712
June 5	" 29	1,742	3,341	194	" 3	1,742	2,904	871	3,484	6,245
" 16	.....	.....	.....	1,742	" 3	.....	.....	1,162	.....	.....
" 26	.....	.....	.....	1,742	" 3	.....	.....	1,162	.....	.....

FALL VS. SPRING SEEDING.—A row of the Detroit Dark Red variety was sown on October 24, immediately before the soil froze. Another thirty-foot row was also sown in the spring, as soon as the soil was ready. Germination of the fall sowing was not as good, which explains the difference in the yields. The roots of the fall sowing were a little larger than those of the spring. The results are as follows:—

TABLE 19.—BEETS—FALL VS. SPRING SOWING

Season of sowing	Date of sowing	Date ready for use	Number of bunches	Number of pounds
Fall	Oct. 24	Aug. 11	1,742	5,372
Spring	May 14	Aug. 16	4,065	6,263

BORECOLE

TRIAL OF VARIETIES.—The two varieties, Tall Scotch, from McDonald's, and Dwarf Green Curled, from Rennie's, were sown on June 16. They were ready for use on September 15. Their yield was 17,424 and 16,552 pounds per acre respectively.

BRUSSELS SPROUTS

VARIETY TEST.—Four varieties were sown on April 15, but the plants perished in the bed. Peculiarly, it has not been possible to grow Brussels Sprouts during the last four years; the plants die in the bed or else, the sprouts do not develop.

CABBAGE

VARIETY TEST.—Seventeen varieties, including two of red cabbage, were sown in sixty-foot rows. The results for 1924 as well as the average for three years are shown in tabular form.

TABLE 20.—CABBAGE —TRIAL OF VARIETIES

Variety	Source of seed	1924		1924	
		Number of days until ready for use	Average number of days for 3 years	Yield per acre	Average yield for 3 years
				lbs.	lbs.
Flat Swedish	D. and F.	99	130·3	78,408	37,558
Enkhuizen Glory	Rennie	66	106	71,438	48,368
Danish Ballhead	S.B.	130	133·5 (a)	69,696	55,757 (a)
Dala	McDonald	115	.....	63,803	.....
Marblehead Mammoth	Ewing	130	122·5 (a)	56,628	45,447 (a)
Danish Ballhead Int.	Harris	130	133 (a)	52,272	37,171 (a)
Danish Short Stem	Harris	99	116	52,272	38,112
Kildonan	S.B.	130	130	52,272	32,104
New Babyhead	D. and F.	99	.....	52,272	.....
Perfection Drumhead Savoy	McKenzie	130	141	43,560	30,104
Danish Ballhead	0-3422	130	.....	43,560	.....
Imp. Amer. Curled Savoy	Farquar	130	.....	43,560	.....
Danish Ballhead solid Imp. (Spain)	Harris	130	.....	39,104	.....
Golden Acre	Harris	66	.....	37,461	.....
Fottlers Imp. Brunswick	S.B.	130	151	34,848	29,795
Red Cabbage					
Danish Delicatess	D. and F.	130	140	52,272	30,784 (a)
Danish Stonehead	Graham	130	.....	43,560	.....

(a) Average for 2 years only.

STARTING CABBAGE.—The object of this experiment is to find if there is any advantage in starting the plants in hotbeds, compared with seeding in the open as soon as the land is ready. Cabbages started in hotbeds yielded 41,236 pounds of marketable heads per acre, while the seed sown in the open did not give a single marketable cabbage. The experience of two years proves that the season of production is too short to sow in the open. This experiment will be continued one or two years yet, as it might be possible, in a very favourable season, to harvest good cabbages from seed sown in the open.

DATES OF SOWING.—A thirty-foot row of each of the varieties Copenhagen Market and Extra Amager Danish Ballhead were sown on May 14 and every ten days thereafter until four sowings had been performed. Although the first sowing was seventeen days earlier than in 1923, the cabbages did not reach their maximum growth and were unmarketable. For this reason, no yield was recorded. Although the results have been negative for two years, this experiment will be continued as it might be possible to harvest marketable cabbages in a warm season. No definite conclusion will therefore be drawn for the time being.

CABBAGE ROOT MAGGOT.—The Early Jersey Wakefield and Copenhagen Market varieties were used for this experiment. A hundred-foot row of each variety was sown; one third was protected with tar-paper discs, one third was sprayed with a 1/1500 bichloride of mercury solution and the other third received no protection. The results are tabulated.

TABLE 21.—PROTECTION OF CABBAGE PLANTS

Variety	Protected with bichloride of mercury		Protected with tar paper		Unprotected	
	Per cent dead	Yield per acre	Per cent dead	Yield per acre	Per cent dead	Yield per acre
		lbs.		lbs.		lbs.
Early Wakefield	0	29,620	0	33,967	8	24,255
Copenhagen Market	0	60,984	0	61,855	8	40,113
Average	0	45,304	0	47,911	8	32,184

The following table shows the comparative results for four years between the protected and unprotected cabbages, as well as the average for the four years:—

TABLE 22—CABBAGE—AVERAGE OF YIELDS

Year	Varieties	Yield per protected acre	Yield per unprotected acre
		lbs.	lbs.
1921	Copenhagen Market	25,612	27,878
	Early Jersey Wakefield	25,960	22,302
1922	Copenhagen Market	26,486	22,304
	Early Jersey Wakefield	23,698	14,288
1923	Early Jersey Wakefield	16,843	28,459
	Danish Ballhead	17,424	22,651
1924	Early Jersey Wakefield	31,793	24,255
	Copenhagen Market	61,419	40,113
	Average	28,654	25,281

Although the average for 1923 was in favour of the unprotected cabbages, the figures are reversed this year, the maggots having caused more injury. At any rate, it is advisable to protect the cabbages against the maggots.

FALL VS. SPRING SEEDING.—Sowings performed in the fall before the ground froze gave no result, and the seed sown in the open made a good growth, but the cabbages were not firm enough for the market. This experiment will be continued.

CAULIFLOWER

CAULIFLOWERS AND ROOT MAGGOT.—A 100-foot row of each of the Early Snowball and Dwarf Erfurt varieties was sown for this experiment. A third of each row was protected with tar-paper discs, a third was sprayed with a bichloride of mercury solution and the remaining third received no protection. The following table shows the percentage of cauliflowers destroyed by the maggots, as well as the yields for 1924.

TABLE 23.—PROTECTION OF CAULIFLOWERS

Varieties	Protected with bichloride of mercury		Portected with tar paper discs		Unprotected	
	Per cent dead	Yield per acre	Per cent dead	Yield per acre	Per cent dead	Yield per acre
		lb.		lb.		lb.
Early Snowball	20	7,405	0	12,705	28	4,782
Dwarf Erfurt	20	8,857	40	8,821	40	6,316
Average	20	8,131	20	10,763	34	5,549

In spite of the protection given, 20 per cent of the protected plants were again destroyed; however, the injury to unprotected cauliflowers was 17 per cent in excess of that to protected plants. The accompanying table gives the yields since 1921 and the average for those years. The average favours the unprotected cauliflowers, but the difference is so slight that protection is recommended just the same, at least to those who have noticed the presence of root maggots. This difference in favour of the unprotected cauliflowers is explained by the fact that there were no root maggots in 1923, and it leads to the belief that the tar-paper discs impede the growth. Two or three additional years will provide definite data.

TABLE 24.—PROTECTION OF CAULIFLOWERS—AVERAGE FOR 1921-24

Year	Varieties	Yield per protected acre	Yield per unprotected acre
		lb.	lb.
1921	Early Snowball	17,598	16,726
	Dwarf Erfurt	10,366	17,598
1922	Early Snowball	13,392	10,455
	Dwarf Erfurt	5,925	5,218
1923	Early Snowball	6,762	13,794
	Dwarf Erfurt	6,982	9,460
1924	Early Snowball	10,055	4,782
	Dwarf Erfurt	8,839	6,316
	Average	9,990	10,543

CARROTS

TEST OF VARIETIES.—Seven varieties were sown in 30-foot rows 30 inches apart. The yields of Rennie's Danvers and McDonald's Chantenay varieties were not recorded as they were injured by water.

TABLE 25.—CARROTS—VARIETY TEST

Varieties	Source of seed	Number of days from seeding until ready for use	Yield per acre
			lb.
Early Scarlet Horn	D. and F.	89	26,136
Nantes Half Long	McDonald	89	23,232
St. Valery	Ewing	89	20,328
Oxheart	Steele	89	18,295
Chantenay	O-2011	89	17,424

DATES OF SOWING.—A 30-foot row of the Chantenay variety was sown as early as possible in the spring, and a row every ten days thereafter until five successive seedings were made. Half of each row was harvestd as soon as the plants were ready for the market, the other half being harvested at the end of the season. Both early and late crops were figured on an area of half an acre. This experiment was conducted alongside the same experiment with beets and it also suffered from the flooding caused by the blocked drain.

The first sowing gave by far the highest yield, and the carrots were ready for the market nearly one month ahead of those of the second sowing. As these are the results of one year only, it would be premature to draw conclusions at the present time. This experiment will be repeated.

THINNING.—A 100-foot row of the Chantenay variety was sown on May 14, at a distance of 30 inches from the adjoining rows. One-third of the row was thinned to 1½ inches, one-third at 2 inches and the remaining third at 3 inches. The following table shows the yields in 1921, 1922 and 1924, as well as the average for three years.

TABLE 26.—THINNING OF CARROTS

Year	Thinning to 1½ inches	Thinning to 2 inches	Thinning to 3 inches
	lb. per acre	lb. per acre	lb. per acre
1921	9,504	12,672	10,560
1922	1,843	2,107	1,185
1924	9,279	12,837	10,310
Average for 3 years	6,875	9,555	7,351

During the three years, thinning to 2 inches has yielded 39.9 per cent over thinning to 1½ inches, and 29.9 per cent over thinning to 3 inches. This experiment will be continued a few years more. It was observed also that the carrots thinned to 2 and 3 inches were more uniform and earlier.

SPRING VS. FALL SEEDING.—A 30-foot row of the Chantenay variety was sown on October 24, that is, just before the ground froze. Another 30-foot row was sown as soon as the soil was ready in the spring. Germination of the fall seeding was not very uniform, but the roots were larger in the fall and ready for the market seven days ahead of the spring-sown carrots. The results are as follows:—

TABLE 27.—CARROTS—FALL VS. SPRING SOWING

Season of sowing	Date of sowing	Date ready for use	Number of bunches	Number of pounds per acre
Spring	May 14	Aug. 18	12,777	18,145
Fall	Oct. 24	Aug. 11	11,035	14,084

CELERY

Seventeen varieties were tried, but none gave good results. The irregular weather, and perhaps the moisture, affected them to a great extent and for that reason, no yields are given. It was the same for the blanching experiments; no yield was recorded.

CUCUMBERS

TRIAL OF VARIETIES.—Ten varieties were sown on May 28. Three hills of each variety, 9 feet apart each way, were sown outside under glass. Growth was very slow at first, due to the cold nights, but it was satisfactory later on. Giant Pera is the earliest, closely followed by Extra Early Russian and Improved Long Green. The results are shown in tabular form:—

TABLE 28—CUCUMBERS—TRIAL OF VARIETIES

Varieties	Source of seed	Number of days from seeding until ready for use	Yield per acre
			lb.
Extra Early Russian	Burpee	98	1,637
Imp. Long Green	McDonald	98	1,032
Davies Perfect	Graham	113	807
Giant Pera	Graham	94	577
Ex. Early White Spine	Livingston	108	431·5
Arlington White Spine	Bruce	113	202
Davies Perfect	O-5621	Frosted on Sept. 24.	
The Vaughan	Vaughan	Frosted on Sept. 24.	
West Indian Gurkin	Burpee	Frosted on Sept. 24.	

KOHL-RABI

Two varieties were sown in 30-foot rows 30 inches apart. McDonald's White Vienna variety yielded 21,054 pounds per acre, while Graham's Purple Vienna variety gave only 6,629 pounds. Both were ready for use 103 days after seeding.

LETTUCE

VARIETY TEST.—The eleven varieties were sown in 15-foot rows, and the plants thinned to 6 inches in the row. The seeding was performed on May 16. The accompanying table shows the yields:—

TABLE 29—LETTUCE—VARIETY TEST

Varieties	Source of seed	Number of days from seeding until ready for use	Yield per acre
			lb.
Cos Paris White	Graham	73	43,560
Trianon	Vaugham	69	39,204
Early Curled Simpson	Ewing	73	34,848
Curled Silesia	Ewing	73	34,848
Grand Rapids	McKenzie	73	34,848
Cabbage Variety	McKenzie	69	30,492
Iceberg	Ewing	77	30,492
Black Seeded Simpson	Ewing	74	30,492
Grand Rapids	O-3412	73	30,492
Grand Rapids	Burpee	73	26,136
Crisp as Ice	Will	73	26,136

FALL VS. SPRING VS. HOTBED SEEDING.—The object of this experiment is to compare, with regard to earliness and yield, fall and spring seedings with plants started in hotbeds and set in the open. The fall sowing was performed on October 24 and the spring sowing, on May 16, that is, as soon as the ground was ready. Seed was sown in hotbeds on April 15 and the plants set out on May 20. The results are as follows:—

TABLE 30—LETTUCE—COMPARISON OF SEEDING

Seeding	Date of sowing	Date ready for use	Number of plants	Number of pounds
Fall	Oct. 24	July 31	4,646	3,485
Spring	May 16	July 28	18,586	14,900
Hotbed	April 15	July 9	32,324	27,878

This table speaks for itself. About 94 per cent of the fall-sown plants failed to grow. A large proportion of the spring-sown plants was destroyed by cutworms, but there was less loss among the plants set out.

ONIONS

The onions of the variety and cultural tests were all injured or destroyed by root maggots, and it was impossible to record the yields. None of the different protective methods tried gave good results. The year was too wet to allow a trial of the method whereby the plants are covered with straw to prevent the fly from depositing her eggs near the plants. These experiments will be continued next year.

PARSLEY

Both varieties, Moss Curled and Triple Curled, are of good value. They were sown on May 14 and ready for use on August 11.

PARSNIPS

VARIETY TEST.—Five varieties were sown in 30-foot rows 30 inches apart, and the plants were thinned to 3 inches in the row. They were sown on May 14 and harvested on October 3. The results are given in the following table:—

According to the four-year average, it would be much better to sow the four varieties of different seasons, as their yield was 21.2 per cent higher. The results of this year show, moreover, that the four varieties had a season of production as long as that of the planting at different dates.

DISTANCES OF PLANTING.—The three varieties used in this experiment were sown on June 2. One row, 30 feet long, of each variety was sown at 1 inch, one row at 2 inches, and another row at 3 inches. The yields are tabulated.

TABLE 36—INTERVALS FOR PLANTING PEAS

Varieties	Date of sowing	Date ready for use	Yield per acre		
			1 inch	2 inches	3 inches
			Pints	Pints	Pints
Thomas Laxton	June 2	Aug. 11	12,777	12,777	11,419
English Wonder	June 2	Aug. 14	16,134	13,550	10,454
Stratagem	June 2	Aug. 28	11,999	9,494	8,323
Average			13,636	11,940	10,065

TABLE 37—AVERAGE FOR TWO YEARS

Year	Yield per acre		
	1 inch	2 inches	3 inches
	Pints	Pints	Pints
1923	28,616	24,393	24,182
1924	13,343	11,936	10,065
Average	20,979	18,164	17,123

The two-year results are identical, that is, the peas planted at 1 inch in the row gave the best yield. This experiment will be continued.

POTATOES

POTATOES—DATES OF PLANTING.—The Green Mountain variety was used for this experiment. The first planting was made on June 2 and five successive weekly plantings were performed thereafter. The rows were 2½ feet apart and the sets at 12 inches in the row. Sets with three eyes only were used, and the seed was weighed in each case. The results are as follows:—

TABLE 38—POTATOES—DATES OF PLANTING

Date of planting	Quantity of seed per acre	Date of digging	Yield per acre	Unmerchantable
	bush.		bush.	bush.
June 2	30·8	Sept. 26	519·2	118·8
June 9	30·8	Sept. 26	492·8	123·2
June 16	31·9	Sept. 26	422·4	105·6
June 23	30·8	Sept. 26	426·8	110·0
June 30	29·7	Sept. 26	272·8	140·8
July 7	25·3	Sept. 26	35·2	158·4

The first date of planting gave by far the best yield. Tubers from each planting have been kept for planting next year, to find which are the best keepers and the most desirable as seed.

KINDS OF SETS.—The object of this experiment is to find the value of sets having one, two and three eyes. The sets were all planted at 12 inches in the row, and the rows were 2½ feet distant. The seed was weighed in each case. The results were as follows:—

TABLE 39—POTATOES—NUMBER OF EYES IN SETS

—	Quantity of seed per acre	Date of planting	Date of digging	Yield per acre	Unsaleable
	bush.			bush.	bush.
One eye	14·3	June 2	Sept. 26	664·1	26·4
Two eyes	23·1	June 2	Sept. 27	554·4	59·4
Three eyes	37·4	June 2	Sept. 26	532·4	136·4

It is remarkable that the single-eye sets gave the highest yield as well as the lowest quantity of unsaleable tubers. The least amount of seed was also required with the one-eye sets. As the above results are for one year only, this experiment will be continued.

DISTANCE OF PLANTING.—Rows 2½ and 3 feet apart and sets at 12 and 14 inches in the row were compared. The quantity of seed required per acre and the yields were recorded in each case. The results are set forth in the accompanying table.

TABLE 40—POTATOES—INTERVALS BETWEEN ROWS AND SETS

Distance between the rows	Distance between the sets	Quantity of seed	Date of sowing	Date of digging	Yield per acre	Unsaleable
	inches	bush.			bush.	bush.
At 2½ feet between the rows	12	23·25	June 2	Sept. 26	528	68·09
	14	20·11	June 2	Sept. 26	533·7	65·9
At 3 feet between the rows	12	19·2	June 2	Sept. 26	500·9	70·19
	14	17·1	June 2	Sept. 26	551·4	67·5

The yield obtained this year is so good that it seems preferable to plant at 14 inches in the row. The distance between the rows does not seem to have affected the yields.

SELECTION WITH REGARD TO IMMUNITY FROM DISEASES AND PURITY OF VARIETY.—From some five hundred hills were selected about fifty hills representing the perfect varietal type and exhibiting no signs of disease. The tubers from these hills will be planted separately, and a selection will be made at the same time from the most productive hills.

LEVEL VS. RIDGE CULTIVATION.—One-half of the plantation was left level during the whole season, and ridged immediately after the last cutivation. The other half was ridged just after planting and after each cultivation. The results were as follows:—

TABLE 41—POTATOES—LEVEL VS. RIDGE CULTIVATION

—	Quantity of seed	Date of planting	Date of digging	Yield of large tubers per acre	Yield of small tubers per acre
	bush.			bush.	bush.
Level	21·6	June 3	Oct. 6	447	137·2
Ridged	22·4	June 3	Oct. 6	383·2	186·4

The level cultivation was superior to ridging; it is also the method generally used.

SPROUTED VS. UNSPROUTED TUBERS.—The Irish Cobbler variety was used for this experiment. The tubers had been exposed to the light to make them sprout, and the sprouts were very strong. The tubers used for comparison had no sprouts. Whole tubers of at least two inches were used for seed. The results are tabulated.

TABLE 42—POTATOES—SPROUTED VS. UNSPROUTED TUBERS

—	Quantity of seed	Date of sowing	Date ready for use	Marketable per acre	Unmarketable per acre
	bush.			bush.	bush.
Whole tubers sprouted	42·9	June 2	Aug. 5	457·6	74·8
Whole tubers unsprouted	40·18	June 2	Aug. 18	466·4	139·8

The sprouted tubers had a start of thirteen days over the unsprouted ones. When the potatoes from sprouted tubers were ready for the market, they were worth, on the local market, 7 cents per pound. When the others were ready, fifteen days later, they were worth 4 cents only.

PUMPKINS

VARIETY TEST.—Four varieties were sown in hills 9 feet apart each way. McDonald's Connecticut Field variety was ready for use 116 days after sowing and yielded 21,332 pounds per acre; the King of the Mammoth was ready after 124 days and it gave 10,756 pounds. Graham's Small Sugar, and Sweet or Sugar from Ottawa did not ripen. Connecticut Field is unquestionably the earliest and most productive.

RADISHES

VARIETY TEST.—Eleven varieties were sown on May 16 in 30-foot rows 15 inches apart. The results are given in the following table:—

TABLE 43—RADISHES—TRIAL OF VARIETIES

—	Source of seed	Number of days from seeding until ready for use	Yield per acre
			lb.
French Breakfast	Patmore	41	7,368·9
XXX Scarlet Oval	Rennie	40	7,114·8
Icicle	D. and F	52	6,606·6
Ey. White Turnip	Steele	56	5,590·2
Scarlet Turnip White Tip	McDonald	52	5,336·1
20-days	Vaughan	41	4,319·7
Ey. Scarlet Globe	Steele	52	3,811·5
Scarlet White Tip	Moore	52	3,811·5
Ex. Ey. Scarlet Wh. Tip	Graham	60	3,557·4
Ey. Scarlet	Moore	52	3,557·4
Chartier	Ewing	56	2,032·8

The French Breakfast variety was the most productive and one of the earliest. It is also of good quality, as well as XXX Scarlet Oval.

FALL VS. SPRING SEEDING.—The object of this experiment is to compare, with regard to earliness and yield, fall seeding, immediately before the ground freezes, with spring seeding as soon as the soil is ready. Germination of the fall-sown seed was very poor and it was impossible to establish a comparison. The spring seeding yielded 4,356 pounds per acre.

RHUBARB

SELECTION FOR PROPAGATION.—Several plants were selected in the plantation from which a very good yield of fine quality rhubarb had been obtained; the seed from these plants will be sown next year and a new selection will be performed in order to obtain an early, productive variety.

FORCING IN THE CELLAR.—Four methods are on trial: Plants exposed to frost for three or four weeks before placing in the cellar; plants not exposed, that is, put in the cellar as soon as dug; roots covered in the cellar with straw kept moist; and roots covered with earth.

The results of this experiment seem contradictory. The roots exposed to frost and covered with straw were ready to use the same day as those covered with earth, while those not exposed to frost and covered with straw were ready to eat nearly three months before the same roots covered with earth. The roots exposed to frost gave a better yield, and those covered with earth were more productive than the ones covered with straw.

SALSIFY

The following varieties were on trial: Rennie's Mammoth Sandwich and Dupuy and Ferguson's Long Black. They were sown on May 14 and ready for use after 193 days. The first variety yielded 5,808 pounds per acre and the second, 3,049 pounds.

SPINACH

The varieties New Zealand (Graham) and Victoria (McDonald) were sown on May 14 and ready for use after 87 and 81 days respectively. The first variety yielded 29,621 pounds per acre and the second, 2,323 pounds only.

TURNIPS

Four varieties were sown on May 14 in 30-foot rows 2½ feet distant, and the plants were thinned to 3 inches in the row. The results were as follows:—

TABLE 44—TURNIPS—TRIAL OF VARIETIES

Varieties	Source of seed	Number of days from seeding until ready for use	Yield per acre
			lb.
Early Snowball	Graham	104	23,232
Golden Ball	Graham	106	22,651
Extra Early White Top Milan	Harris	104	15,245
Extra Early Purple Top Milan	McDonald	104	12,522

GENERAL NOTES

The following kinds of vegetables failed to ripen or were destroyed by frost before they were ready for use: tomatoes, egg-plants, peppers, celeriac, melons, pumpkins, sweet corn, squash. The year did not favour these vegetables; excess moisture and the cold nights are the two main factors which affected them.

FLOWERS

One hundred and eighty-six varieties of flowers were tested in 1924. Many failed to bloom, but the following (by order of merit) may be classified as fairly early and hardy: Aster, Phlox, Stocks, Antirrhinum, Zinnia, Linaria, Malope, Nasturtium, Helichrysum, Calendula, Mignonette. Others also grew

well this year, but in general they were not hardy enough. The flower borders were admired by all those who visited the Station during the summer.

About one thousand flowering bulbs were planted in the fall of 1923. Five per cent only were winter-killed. The soil had been covered with manure.

CEREALS

Variety tests were started this year, under rather poor conditions. The spring was very late. Seeding was begun on June 9 and 10 only, and the cold June nights, added to rather dry weather, prevented a rapid and uniform growth. Moreover, the land used is very retentive of moisture and as it was drained only last year, the effect was not entirely as desired. August and September were very wet, stimulating growth, but, at the same time, much rust appeared which lowered the yields. The oats were fairly thick, but the same cannot be said of wheat or barley.

SPRING WHEAT

Four varieties of spring wheat were tried in 1924. They were sown on June 9 to 10 in triplicate plots measuring one-fortieth of an acre, at the rate of 1½ bushels per acre, in a very uniform sandy loam. This land bore a crop of grain the previous year which was cut green; it had never been manured before. A four-year rotation will be followed in the future in connection with these tests. The results are shown in table 45.

OATS

Seven varieties of oats were tried at this Station in 1924. They were sown on May 9 and 10 in triplicate plots measuring one-fortieth of an acre, at the rate of two bushels and a half, in a sandy loam. This land bore previously a crop of oats which was cut green. It was never manured before. The results are as tabulated. (Table 46.)

TABLE 45—WHEAT—TEST OF VARIETIES

Varieties	Date of ripening	Number of days maturing	Average length of straw including head	Strength of straw on scale of 10 points	Actual yield of grain per acre
			inches		bushels
Prelude *(a)* O–135	Sept. 25	107	24	10	11·1
Garnet O–652	Oct. 2	114	28	10	10·0
Ruby *(a)* O–623	Oct. 3	115	25	10	5·6
Marquis *(a)* O–15	Oct. 8	120	27	10	4·8

(a) Duplicate only.

TABLE 46—OATS—TEST OF VARIETIES

Varieties	Date of ripening	Number of days maturing	Length of straw including head	Strength of straw on scale of 10 points	Actual yield of grain per acre
			inches		bushels
Alaska *(a)*	Sept. 19	101	28	9	37·0
Banner *(a)*	Oct. 2	120	34	10	27·0
Abundance	Oct. 1	113	34	10	27·0
Gold Rain	Sept. 25	107	32	10	23·3
Banner *(a)* 44 M.C	Oct. 8	120	31	10	24·1
Victory	Oct. 4	116	31	10	24·0
Laurel O–477	Sept. 27	111	28	10	11·6

(a) Sown in duplicate plots only.

TABLE 47—BARLEY—TEST OF VARIETIES

Varieties	Date of ripening	Number of days maturing	Length of straw including head	Strength of straw on scale of 10 points	Actual yield of grain per acre
			inches		bushels
Chinese *(a)* O–60 (six-rowed)	Sept. 29	111	30	10	20·0
Duckbill *(a)* O–57 (two-rowed)	Oct. 3	115	30	10	9·8
O.A.C. No. 21 (six-rowed)	Sept. 28	110	29	10	9·5
Albert O–54	Complete failure				
Himalayan O–59	"				

(a) Sown in duplicate plots only.

BARLEY

Three varieties of six-rowed and two of two-rowed barley were tried at this Station in 1924. They were sown on June 9 and 10, in triplicate plots of one-fortieth of an acre, at the rate of two bushels per acre, in a sandy loam. The land has also borne an oat crop which had been cut green. The varieties Albert Ottawa-54 and Himalayan Ottawa-59 were not harvested because it was not worth while.

The results for the three other varieties are as tabulated. (Table 47.)

SPRING RYE

One variety only was sown in the regular triplicate one-fortieth of an acre plot. It was sown on June 9 and harvested on October 3. The soil, a sandy loam, had borne an oat crop the previous year which had been cut green.

The results are as tabulated. (Table 48.)

TABLE 48—SPRING RYE—TEST OF VARIETIES

Varieties	Date of ripening	Number of days maturing	Length of straw including head	Strength of straw on scale of 10 points	Actual yield of grain per acre
			inches		bushels
Ottawa Select 12	Oct. 3	115	45	10	8·8

BEANS

A single variety, Norwegian Ottawa-710, was sown on June 10 in a plot measuring three-fortieths of an acre, and in rows two and a half feet apart. The growth was satisfactory, but it did not ripen prior to the fall frosts.

FORAGE PLANTS

The plan prepared in 1924 relative to forage plants includes variety tests of mangels, swede turnips, fall turnips, field carrots, fodder corn, sunflowers, white, red and alsike clover, alfalfa, sweet clover, clover and grass mixtures for the production of hay, timothy and red clover seed and tests of annual plants for the production of hay.

MANGELS AND SUGAR MANGELS

Mangels were a complete failure in 1924, for of the forty-two varieties sown, not one had a large enough crop to be harvested. They were sown too late in the spring owing to unfavourable weather, and the August and September moisture added to the relatively cold weather during those two months also hindered growth. Over fifty per cent of the mangels were destroyed by cutworms, in spite of frequent applications of poisoned bran as soon as they appeared.

SWEDE TURNIPS

Twenty-two varieties were sown on June 13 on triplicate plots of 1/181.5 acre, at the rate of four pounds per acre, the rows being 30 inches apart. They were thinned to 12 inches in the row. Sixteen tons of manure per acre were applied the previous fall. The turnips were harvested on October 9.

The frequent rains and the cold weather, as well as a late spring, affected the yields to a large extent.

TABLE 49—TRIAL OF SWEDE TURNIP VARIETIES

Varieties	Source of seed	Yield per acre	
		tons	lb.
Dales B.L. 775	D.L.F., Denmark	8	1,121
Bortfelder	Hartman	7	1,732
Haleswood Green Top	Ewing	7	157
Fynsk Bortfelder	D.L.F., Denmark	6	1,250
Ditmars	McNutt	5	1,189
Yellow Tankard B.L.	D.L.F., Denmark	4	1,985
Bangholm	Dupuy & Ferguson	3	1,804
Hall's Westbury	Ewing	3	1,742
Shepherd	Hartman, Denmark	3	1,260
Perfect Model	Dupuy & Ferguson	3	1,260
Garton's Superlative	Ewing	3	897
Kangaroo	Dupuy & Ferguson	3	353
D. & F. Favourite	Dupuy & Ferguson	3	353
Bangholm	Ewing	2	1,751
Shepherd	Trifolium, Denmark	2	1,445
Ne plus ultra	Dupuy & Ferguson	2	1,022
Best of all	Ewing	2	538
Improved Yellow	General Swedish, Sweden	2	235

NOTE.—Eleven other lots were included in this test, all of which were a complete failure.

FALL TURNIPS

Eleven varieties were sown in triplicate 1/181.5 acre plots, the rows being 30 inches apart. The seed was sown on June 13 at the rate of four pounds per acre, and the plants were thinned to 12 inches. The land retained water to a marked degree, and it was injurious to the crop. The results obtained are as follows:—

TABLE 50—FALL TURNIPS—TEST OF VARIETIES

Varieties	Source of seed	Yield per acre	
		tons	lb.
Purple Top Mammoth	Steele Briggs	11	1,351
" Aberdeen	Suttons	8	033
Early Six Weeks	Suttons	7	1,730
White Globe	Ewing	7	822
Pomeranian White Globe	Steele Briggs	6	559
Red Paragon	Suttons	4	1,983
Hardy Green Round	Suttons	4	861
Purple Top Mammoth	Suttons	4	739
Aberdeen Purple Top	Steele Briggs	3	715
Green Top Yellow Aberdeen	Ewing	3	263
Greystone	Steele Briggs	2	960

FIELD CARROTS

Fourteen varieties were sown in triplicate 1/181.5 acre plots, the rows being 30 inches apart and the plants thinned to six inches in the rows. They were sown on June 14 and harvested on October 9. The results are as follows:—

TABLE 51—FIELD CARROTS—TEST OF VARIETIES

Varieties	Source of seed	Yield per acre	
		tons	lb.
Large White Vosges	Dupuy & Ferguson	2	1,445
Improved Intermediate White	Dupuy & Ferguson	2	446
Yellow Belgian	Ewing	2	265
White Belgian	Dupuy & Ferguson	2	178
Improved Intermediate White	Ewing	2	174
White Belgian	Hartman, Denmark	1	1,630
New Yellow Intermediate	Ewing	1	1,509
Half Long White	General Swedish, Sweden	1	1,357
Champion,	General Swedish, Sweden	1	1,125
James B.L. 781	D.L.F. Denmark	1	1,086
White Belgian	Ewing	1	723
Champion	Hartman, Denmark	1	723
White Belgian	Trifolium, Denmark	1	360
Danish Champion	C.E.F.	1	178

SUNFLOWERS

Ten varieties were sown on June 17 in duplicate 1/129.64 acres plots, the rows being 42 inches apart and the plants thinned to 12 inches in the row. Sixteen tons of manure had been applied the previous fall. The crop was cut on October 10, and notes were taken on growth. The sunflowers were very much affected by the wet, cold season. The results obtained are shown in table 52.

TABLE 52.—TRIAL OF SUNFLOWER VARIETIES—

Varieties	Source of seed	Height		Yield per acre, green		Yield per acre, dry	Remarks
		ft.	in.	tons	lb.	lb.	
Russian Giant	Dakota Imp. Seed Co.	5	2	5	047	1,517	No flowers when cut.
Black	C.P.R.	4	6	4	491	1,512	75 per cent in bloom.
C.E.F.	Ottawa	5		4	815	1,182	" "
Manchurian	C.P.R.	4	9	3	1,778	1,169	" "
Mammoth Russian	C.P.R.	4	6½	4	361	1,123	" "
Mammoth Russian	McDonald	4	2	3	676	1,054	" "
Manchurian	McKenzie	4	9	3	546	983	" "
Mixed	C.P.R.	4	8	3	935	932	" "
Montcca	C.P.R.	4	5	3	418	909	" "
Mennonite	Rosthern	3	6	2	1,833	835	" "

ANNUAL HAY CROPS

Seventeen seedings for annual hays were grown in triplicate 1/80 acre plots. The crop truly represented field culture conditions. The results were as shown in table 53.

TABLE 53.—TEST OF ANNUAL HAY CROP

Varieties	Date of sowing	Date of cutting	Yield per acre, green		Yield per acre, dry		Remarks
			tons	lb.	tons	lb.	
Oats, peas and vetches	June 12....	Sept. 27....	5	1,813	2	160	Cut when oats at milky stage. Not much vetch growth. Peas in bloom.
Oats, Gold Rain.....	" 12....	" 25....	5	1,467	2	070	Cut at the milky stage.
Oats and peas.....	" 12....	" 25....	5	560	1	1,198	Oats cut at milky stage. Peas in bloom.
Spring rye.....	" 12....	" 23....	3	1,387	1	915	Cut at dough stage.
Oats, Banner.....	" 12....	" 29....	4		1	803	Cut at dough stage.
Oats, Victory.....	" 12....	" 29....	4	960	1	673	Cut at milky stage.
Hulless barley.....	" 12....	" 27....	3	1,627	1	526	Cut at dough stage.
Oats, O.A.C.....	" 12....	" 26....	2	1,760	1	129	Cut at milky stage.
Peas, Prussian Blue...	" 12....	" 27....	3	760	0	1,474	Cut when in bloom.
Peas, Golden Vine....	" 12....	" 30....	3	533	0	1,399	Cut when in bloom.
Peas, Arthur.....	" 13....	" 27....	2	880	0	1,269	Cut when in bloom.
Hubam clover.....	Complete failure						
Teff grass.....	"						
Japanese millet.....	"						
Hog millet.....	"						
Sudan grass.....	"						
Golden millet.....	"						

FODDER CORN

The trial of fodder corn varieties was again a complete failure. The corn had reached a height of about two feet when it was destroyed by frost. The cold and wet weather contributed to the failure.

TRIAL OF VARIETIES OF CLOVERS AND GRASSES FOR THE PRODUCTION OF HAY AND SEED

The following were sown in the spring: thirty-eight different mixtures of clover and grass for the production of hay, three different varieties of timothy, six of white clover, five of sweet clover, ten of red clover; plots were also seeded in connection with trials on the best way to produce timothy and red clover seed. These tests were all conducted in triplicate plots.

The object of these experiments is to find the best mixture for the production of hay and the best clover and grass varieties.

POULTRY

A considerable poultry extension is noted for the last year, thanks to the encouragement given by the Agricultural Society through the agriculturist for the Abitibi district, in co-operation with the Poultry Division of the Central Experimental Farm, to flock contests, and a diffusion of good males and eggs from excellent hens. In 1923, 2,767 cases of eggs valued at $37,354 were imported into this district, representing a per capita expense of $2.21; in 1924, only 1,791 cases of eggs valued at $24,178.50 were imported, a per capita expense of $1.43. The decrease in 1924 was of 976 cases valued at $13,176, or 78 cents per capita. These figures show the results of the work carried on in this line. The extension work will be continued more vigorously in 1925.

On December 31, 1924, the flock consisted of 142 hens, 175 pullets and 30 cocks and cockerels, all Barred Plymouth Rocks. This breed is well adapted to the climate. The plant now comprises three 100-hen poultry houses, four colony houses, a brooder house which will accommodate over one thousand chicks, and an administration building which includes a grain room, a killing room, an office and a spacious incubator room. The whole faces the south and is protected against northern winds by a hillock and a grove, an ideal location being thus provided.

The poultry investigations cover breeding, incubation, rearing and feeding. Good breeding stock and hatching eggs are sold at reasonable prices.

Hens and pullets with a satisfactory egg production are selected for breeding. In 1924, only twenty-four hens with an egg production over 135 eggs (the average production being 151 eggs), were mated; the mated pullets had produced an average of 33 eggs up to February 10. In 1925, forty-eight hens with an average production of 165 eggs will be mated, and no pullet having laid less than 60 eggs up to February 17 will be mated. The influence of the use of good breeding stock and the value of the trap-nest, through which the best layers only are mated each year, are already visible. The cocks used were out of dams with a 235 to 264 egg production record.

BEST KIND OR MAKE OF INCUBATORS

Three different makes and two different kinds of incubators were compared. Incubator No. 1 was heated by hot air and the two others by hot water. Results obtained are given in table 54.

TABLE 54.—INCUBATION RESULTS WITH DIFFERENT KINDS OF INCUBATORS

Number of incubator	Kind of incubator	Total number of eggs set for incubation	Number of fertile eggs	Per cent fertile	Number of chicks	Per cent total eggs hatched	Per cent fertile eggs hatched	Number of chicks alive at the age of 3 weeks	Per cent hatched chicks alive at the age of 3 weeks	Total eggs required for one chick hatched	Total fertile eggs required for one chick hatched	Total eggs required for a three-week-old chick
1	Hot air.....	650	557	85·7	247	38·0	44·3	195	78·9	2·6	2·2	3·3
2	Hot water.....	900	658	73·1	166	18·4	25·2	136	81·9	5·4	4·0	6·6
3	Hot water.....	830	691	83·3	232	28·0	33·6	161	69·4	3·6	3·0	5·2

The incubation room was very moist, and there is no doubt that under these conditions, the hot-air system is preferable; however, the two hot-water machines have given such good results elsewhere under ordinary conditions that this experiment will be repeated in another incubation room in the new administration building, where ventilation and moisture will be under better control.

BEST SITE FOR INCUBATION

In order to know which is the best site for incubation, an incubator was placed in a room above the ground level (the second story). Another one was left in the incubation room located in the cellar of the boarding house. Both incubators were of the same make and of the same capacity, and they were started at the same date. The total fertile eggs required to hatch one chick in the cellar was 3.09 and in the second story location, 1.8.

The incubation room in the boarding house made a very poor showing as a second story is not considered the best location for an incubator and yet the production in the latter location was 79.5 per cent the better. This experiment will be continued in the incubation room of the administration building.

BEST DATE FOR INCUBATION

The first eggs for hatching were set on March 13 and the last ones, on May 16. The accompanying table shows the results obtained from eggs set in March, April and May. All the eggs set in March hatched in April; 33⅓ per cent of those set in April hatched during the same month and the balance, 66⅔ per cent, in May; and all the eggs set in May hatched from June 1 to 7. (Table 55).

TABLE 55.—BEST INCUBATION DATES

Date set for incubation	Total eggs set for incubation	Number fertile	Per cent fertile	Number of chicks	Per cent total eggs hatched	Per cent fertile eggs hatched	Number of chicks alive at age of 3 weeks	Per cent chicks alive at age of 3 weeks	Total eggs required for one chick hatched	Total fertile eggs required for one chick hatched	Total eggs required for a three-week old chick
March	390	294	75·4	85	21·8	28·9	69	81·2	4·6	2·4	5·6
April	1,350	1,047	77·6	276	20·4	26·3	205	74·3	4·9	3·8	6·6
May	640	565	88·3	284	44·4	50·3	218	76·8	2·3	2·0	2·9

It would seem, according to the table, that the eggs set in March gave a better result than those set in April. These results however are due largely to water which remained stagnant in the cellar during April when snow was melting, and also to the difficulty experienced in obtaining satisfactory ventilation during that period. The better results obtained early in May are due to the disappearance of the water at that time. This experiment will be repeated in the new incubation room.

CRATE VS. PEN FATTENING

While comparing crate and pen fattening, corn and barley meals were also compared, as well as a mixture of barley and corn meals. The check group was left unconfined; it was fed a ration of whole grain and an ordinary wet mash.

The object of this experiment was (1) to demonstrate that it is more profitable to fatten cockerels in crates; (2) to find the relative value of corn and barley meals respectively in fattening, and of both combined.

Thirty-six birds were selected for this experiment; they were divided into groups of six birds. The first three groups were placed in crates and the three others were left free in pens. Group No. 1 received equal parts of ground oats, corn meal and shorts with skim-milk; group No. 2 was fed equal parts of ground oats barleymeal and shorts with skim-milk; group No. 3 ground oats 1 part, barleymeal ½ part, cornmeal ½ part, shorts 1 part, and skim-milk; group No. 4 received the same ration as crated group No. 1, and pen No. 5, the same ration as crated group No. 2. Group No. 6 (unconfined) was fed an ordinary ration composed of whole grain, corn chop and wheat in equal parts and a small quantity of a wet mash including equal parts of cornmeal middlings and oats. The birds in each group were all of the same weight, and the fattening period began on December 6 after the birds had been starved for twenty-four hours. The birds were killed twenty-one days later, on December 27. The results are shown in table 56.

TABLE 56—FATTENING EXPERIMENT

Pen and special feed	Initial weight	Weight upon completion of experiment	Value at outset at 30c. per lb.	Value upon completion, at 30c. per lb.	Increase in value	Value of feed	Profit	Fattening method
	lbs.	lbs.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	
Group No. 1— Corn meal	38	45	11 40	13 50	2 10	0 56	1 54	Crate.
Group No. 2— Barley meal	38	42½	11 40	12 68	1 28	0 37	0 91	Crate.
Group No. 3— Corn meal and barley meal	38	42	11 40	12 60	1 20	0 46	0 74	Crate.
Group No. 4— Corn meal	38	41	11 40	12 30	0 90	0 56	0 34	Pen.
Group No. 5— Barley meal	38	40½	11 40	12 08	0 68	0 37	0 31	Pen.
Group No. 6— Usual ration	38	43	11 40	12 90	1 50	1 17	0 33	Pen.

The crated groups made the best gains, with the group which was fed cornmeal in the mash leading the others. This group had also the best appearance, and the flesh was yellower than in the other groups which is advantageous for the local market. It is astonishing that group No. 6 made such a considerable gain; it may have been due to the fact that feed was not withheld from the birds prior to the fattening period and that owing to the cold, fattening season, the grain ration supplied more animal heat. They consumed from sixteen to twenty pounds more than any other pen. This experiment will be repeated and started earlier.

PULLET VS. HEN EGGS FOR INCUBATION

One thousand nine hundred and fourteen hen eggs and four hundred and sixty-six pullets eggs were incubated, and separate records were kept of their fertility, of the number of chicks hatched and of those alive after three weeks. The results are given in table 57.

In 1923, 4.3 hen eggs and 7.9 pullet eggs were required to produce one chick. This year, the fertility and percentage of hatches were a little higher in hen than in pullet eggs, and the mortality of chicks from the pullet eggs was greater. The mortality had been exactly the same in 1923, but in 1924, it was 8.3 per cent higher among chicks from pullet eggs than among those from hen eggs.

TABLE 57.—INCUBATION RESULTS WITH HEN AND PULLET EGGS

—	Total eggs	Number fertile	Per cent fertile	Number of chicks	Per cent eggs hatched	Per cent fertile eggs hatched	Number of chicks alive at age of 3 weeks	Per cent chicks alive at age of 3 weeks	Total eggs required for one chick hatched	Total fertile eggs required for one chick hatched	Total eggs required for a three-week-old chick
Hen eggs	1,914	1,560	81·5	513	26·8	32·9	400	78·0	3·7	3·0	4·7
Pullet eggs	466	346	74·2	132	28·3	38·1	92	69·7	3·5	2·6	5·1

CORN VS. BARLEY FOR EGG PRODUCTION

The object of this experiment is to ascertain the relative value of corn and barley for egg production. As barley can be produced economically in this district, its use as a poultry feed would obviate the necessity of importing corn into the district, should it prove to be of equal or nearly equal value with the latter grain.

Twenty-five pullets were selected for this experiment; they were weighed at the beginning and end of the experiment, which covered a period of six months (from November 1 to April 30). The first group was fed a ration composed of equal parts of wheat, corn and oats, and a dry mash including equal parts of bran, oats and corn very finely ground, and one-half part of meat meal. The second group received exactly the same ration except for the corn, which was replaced by barley.

The cost of one dozen of eggs from the pullets which received the barley in their ration was 1½ cents over that of one dozen of eggs from the pullets which were fed the corn. The scratch feed used with the corn was valued at $2.06 and the mash, at $2.59; with the barley, the figures were $1.86 and $2.31 respectively. (Table 58). This experiment was repeated in the fall and will end on April 30 next, in order to establish comparisons for an average covering several years.

TABLE 58.—COMPARISON OF CORN AND BARLEY FOR EGG PRODUCTION

—	Number of birds	Number of days in the experiment	Total weight on November 1	Total weight on April 30	Increase in weight	Number of eggs laid	Value of eggs at 60c. a dozen	Grain	Mash	Meat at $1 per 100 lb.	Oyster shell at $3 per 100 lb.	Sprouted oats at $1.69 per 100 lb.	Value of feed	Gain per pen	Cost of 1 doz. eggs
			lbs.	lbs.	lbs.			lbs.	lbs.	lbs.	lbs.	lbs.	$	$	cts.
Lot 1— Corn	25	180	87	127·5	40·5	664	33·20	464·5	327·5	54·5	38·5	121	21·89	11·31	39·5
Lot 2— Barley	25	180	85	124·5	39·5	583	29·00	464·0	328·5	54·5	38·5	121	19·96	9·04	41·1

COMPARISON OF CLOVER AND MANGELS FOR EGG PRODUCTION

The object of this experiment is to compare clover leaves with mangels as green feed. It was started in 1922-23 and repeated in 1923-24, from November 1, 1923 to April 30, 1924. Ninety-eight pullets were selected, divided into two equal lots and placed in a 100-hen house. When dividing the birds, the age and general development were also considered. The two groups received exactly the same ration with regard to the scratch feed and the mash meal. The first group was fed cut clover in a wet mash at noon, and had clover leaves constantly available in a hopper. The other group received pulped mangels in the noon wet mash; mangels were also constantly available to these birds.

The grain ration was composed of equal parts of wheat, corn and oats and it was scattered morning and evening in the litter. The mash included equal parts of bran, ground oats and corn meal and one-half part of meat meal. The birds were also constantly provided with grit, oyster shell and charcoal in a hopper. The results are given in Table 59.

In 1923, the group which was fed the mangels produced less eggs, and the latter cost about one-half cent less per dozen. However, the average for the two years shows a superiority of five cents in favour of the clover. These results must not be regarded as conclusive, and the investigations will be continued. It may be reasonably believed, however, that the clover leaves picked up in the mow have a great value for winter feeding, and the clover may be fed jointly whenever it is possible to give a succulent feed.

TABLE 59.—COMPARISON OF CLOVER AND MANGELS FOR EGG PRODUCTION

—	Number of birds	Number of days	Total weight Nov. 1	Total weight April 30	Increase in weight during experiment	Number of eggs laid	Value of eggs at 60 c. per doz.	Grain at $2.08 per 100 lb.	Mash at $2.59 per 100 lb.	Meat scrap at $1 per 100 lb.	Oyster shell at $3 per 100 lb.	Clover at $1 per 100 lb.	Mangels at 20c. per 100 lb	Value of feed	Gain per pen	Cost of 1 doz. eggs.
				lbs.	lbs.		$	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	$	$	cts.
Lot 1— Clover	45	180	207	247·0	40·0	973	48·65	968	502·5	101·5	51·2	112·5	.....	37·09	11·56	45·8
Lot 2— Mangels	47	180	205	248·0	43·0	962	48·10	976	499·0	101·5	51·0	.....	278·5	36·31	11·79	45·2
Average for 2 years:— Clover	35	140	184	177·7	30·12	776	38·80	755	386·4	92·2	34·6	80·2	.....	28·35	10·45	43·9
Mangels	36	140	183	177·6	31·12	711	35·55	742	385·0	92·2	34·5	.....	218·7	27·86	7·69	47·1

BEES

Eight hives were placed in the cellar of the superintendent's house, on November 8, 1923, The bees had had a flight on a bright day and the hives were in perfect condition when put in. All these hives wintered perfectly except one, which by an accident died as the material which blocked its entrance during transportation of the hives to their winter quarters was not removed. The seven remaining hives were taken out on April 29. They had lost few bees and the queens were all alive. There was still an ample quantity of stores left for consumption until the first honey flow.

The 1924 season did not favour honey production. The weather was relatively cold and wet. Out of a total of sixty-two days, it rained on fifteen days in July and seventeen days in August. The first nectar was taken off osiers and willows on May 7. Dandelions commenced to bloom on May 27; choke cherries, on June 8; blueberries and Labrador tea, on June 18. Alsike clover was first in bloom on June 25, but the weight of the scale colony began to increase from this source on July 2 only. Fireweed gave a good flow from July 21 up to August 10. Little or no honey was obtained after that date.

As in previous years, a hive was placed on a scale in order to find out each day the weight increase or decrease. The maximum and minimum temperature were also recorded, as well as the hours of sunshine each day, to determine the effect of temperature on flow. The results given by the scale hives are as follows:—

——	May	June	July	Aug.	Sept.	Total
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Gain	.....	33½	69½	48	.....	151
Loss	2½	.....	.....	.....	19	21·5

The highest gain was recorded in July. The highest gain in a single day, ten pounds, was recorded on July 20.

Seven artificial swarms were obtained during the summer, which raised the total to fourteen, but four of these colonies failed to build up to desired strength by fall and in two others, the queen died. As it was found impossible to obtain queens, those six colonies were united with the parent colonies, which left a total of eight hives, the number placed in the cellar in the fall. The hives were fed in the fall and taken into the superintendent's cellar on November 8, after a cleansing flight.

The folowing is a detailed statement of the season's operations:—

Quantity of honey produced	346 lbs.
Average quantity of honey, spring count	49·4 lbs.
Net value of honey produced	$55.26
Net value of honey per hive	$7.89

FIBRE CROPS

The season of 1924 was most unfavourable to flax and hemp culture. Owing to the cold weather and to snow which fell on May 19, it was very late when the soil thawed out, and it was not possible to seed before June 16. It must be said, however, that the soil is a sandy loam, cold and very retentive of moisture. Seeding on other parts of the farm provided with better drainage was commenced on June 2. The season was also very cold, and the crops grew very slowly.

The experiments were conducted on land which had borne a crop of roots the previous year, and to which 16 tons of manure per acre had been applied. The following four-year rotation was adopted this year: Hoed crop; grain; clover hay; flax.

Although no experiment of value was conducted with the rotations which included flax, it is generally known that flax gives better results following hay or grain. It is generally admitted that flax succeeding a manured, hoed crop grows too luxuriantly, and its quality is altered.

TRIAL OF FLAX VARIETIES.—Seven varieties were sown on June 16 and pulled on September 26. These tests were made on triplicate plots measuring one-sixtieth of an acre, and the seed was broadcast at the rate of 1½ bushels per acre. One foot around each plot was seeded and pulled, and the flax discarded just before the harvest; this was done to prevent including the border plants when compiling the yield of the plot, as such plants, which benefit by the path around the plot, influence the yield to a large extent. The average yields are shown in table 60.

TABLE 60—TRIAL OF FIBRE FLAX VARIETIES

Varieties	Height	Yield per acre	Remarks
	inches	lb.	
Longstem	26	2,800	Too green when pulled.
829 C	24	2,800	" "
Saginaw	24	2,720	" "
Pure Line No. 5	23	2,640	" "
770 B	24	2,373	" "
Yellow B	22	2,040	Not sufficiently advanced.
Riga Blue	22	2,013	The earliest. Pulled when about half of the bottom leaves were yellow.

DIFFERENT DATES OF SEEDING FLAX.—Four different sowings were performed in triplicate plots measuring one-sixtieth of an acre. The Riga Blue variety was used and the first seeding was made on June 16, simultaneously with the variety test sowing. The three subsequent sowings were performed at weekly intervals. The flax from the first sowing was ready to pull on October 1, and the yield was 2,013 pounds per acre. The others did not mature sufficiently for pulling.

TRIAL OF HEMP VARIETIES.—Two varieties only, Chington and Minnesota No. 8, were sown on June 16 in order to ascertain if hemp for fibre may be profitably grown in the district. They were sown in triplicate plots measuring 18½ by 46 feet, with a one-foot border to be discarded all around the plot, leaving an area of one-sixtieth acre. Germination of seed was very poor and the weather relatively cold and wet, so growth was very irregular. The highest plants barely reached 3½ feet, and the average was only 2½ feet. As these tests were complete failures, the yields were not recorded.

DIFFERENT DATES OF SEEDING HEMP.—Five different sowings were performed in triplicate plots measuring one-sixtieth of an acre, the same method being used as for the variety tests. The first seeding was made on June 16 and the four subsequent seedings were performed at weekly intervals. For the reasons stated above in connection with the variety tests, the hemp was not cut, the last sowings having reached a height of a few inches only.

GENERAL NOTES

During the summer, Farmers' Field Days were organized for the first time at this Station. The first one, for the eastern section, drew nearly two hundred persons. The number was lower for the western section, as train hours did not permit coming and returning the same day. Upon the latter occasion, three

meals and sleeping accommodation were provided for twenty-two persons. For the eastern excursion, a noon lunch was served.

The farmers' growing interest in the work of the Station is also shown by the increase in the number of letters received requesting information and bulletins.

The superintendent and the assistant visited many farmers and attended several school fairs as well as a poultry exhibition.

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