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DOMINION OF CANADA  
DEPARTMENT OF AGRICULTURE  
DOMINION EXPERIMENTAL FARMS

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# EXPERIMENTAL STATION

LENNOXVILLE, QUE.

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REPORT OF THE SUPERINTENDENT  
J. A. McCLARY  
FOR THE YEAR 1922



A corner of the sheep pasture on the banks of the St. Francis river.

OTTAWA  
F. A. ACLAND  
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY  
1923

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# EXPERIMENTAL STATION, LENNOXVILLE, QUE.

REPORT OF THE SUPERINTENDENT, J. A. McCLARY

## THE SEASON

The weather throughout the month of January was quite cold, the thermometer registering below zero on eighteen days. February was changeable, there being some mild days, while the thermometer dropped to 37 degrees below zero the night of the 16th, the coldest registered during the winter. March was unusually mild, while April was cool, cloudy and wet. The frost was out of the ground so that ploughing was commenced on April 10. May was cool and dry with only one-quarter inch of rain the last three weeks of the month.

The first seeding was done on May 1 and Indian corn was planted on the 22nd. During June rain fell on sixteen days, amounting to 10.34 inches, which is the heaviest rainfall experienced since the Farm started. July was cool and favourable for haying which was commenced on the 6th. Rain fell on eight days during the month of August amounting to 4.75 inches. Harvesting was commenced on the 14th and threshing on the 22nd.

September was an unusually dry month, which made it difficult to do fall ploughing. Cutting corn and filling silos was commenced on the 6th. The weather during October and November was cloudy and mild which enabled farmers to finish ploughing, fencing and other fall work.

### METEOROLOGICAL RECORDS, 1922

Month	Temperature—F.			Precipitation			Total Sunshine
	Highest	Lowest	Mean	Rainfall	Snowfall	Total	Hours
				Inches	Inches	Inches	
January.....	38	-35	8.58	0.25	17.50	2.00	139.4
February.....	47	-37	14.28	1.28	14.50	2.73	104.2
March.....	60	-10	27.98	1.44	6.50	2.09	155.9
April.....	67	12	40.21	2.25	10.00	3.25	166.3
May.....	85	20	53.12	1.50	.....	1.50	251.3
June.....	86	37	62.48	10.34	.....	10.34	156.0
July.....	87	42	65.32	2.12	.....	2.12	279.0
August.....	86	36	62.56	4.75	.....	4.75	220.9
September.....	88	26	56.05	1.28	.....	1.28	208.1
October.....	81	16	44.25	3.23	1.00	3.33	108.3
November.....	57	09	34.31	1.19	2.60	1.45	68.3
December.....	53	-32	14.19	0.15	13.00	1.45	57.6
Total.....	.....	.....	.....	29.78	65.10	36.29	1,915.3

## ANIMAL HUSBANDRY

### WINTER FEEDING OF BEEF CATTLE

During the fall of 1921, ninety-two head of beef steers were purchased locally in order to use up the surplus hay and ensilage produced at the Farm. They were mostly two-year-old Shorthorn grades and included some fairly good stockers which were used as experimental feeders. The different experiments carried on included the testing of standard elevator screenings as a meal ration for fattening steers; a comparison of heavy versus light stockers for



winter feeding; long versus short grain feeding periods, and a comparison of the gains made by steers kept loose in a pen and steers tied up in the stable. The steers were kept until the first of May when they were sold and shipped to Montreal.

LIGHT *versus* HEAVY STOCKERS FOR WINTER FATTENING

In this experiment two lots of ten steers each were used, the first lot averaging 719 pounds per steer and the second lot averaging 886 pounds per steer,



Group of winter fattened steers of export size, ready for market, May 1.

or a difference of 167 pounds when they entered the stable in the fall. Lot No. 1 cost 4½ cents per pound and lot No. 2, 5½ cents per pound.

LIGHT VS. HEAVY STOCKERS

	Light Stockers	Heavy Stockers
Number of days in test.....	192	192
Number of steers in each lot.....	10	10
Average weight at beginning of period..... lb.	719.5	886
Average weight at end of period..... "	983.0	1,169.5
Average gain per steer..... "	263.5	283.5
Average daily gain..... "	1.37	1.48
Average cost per steer..... \$	32.38	48.73
Hay eaten per steer daily..... lb.	10.0	10.0
Silage eaten per steer daily..... "	30.0	30.0
Meal eaten per steer daily..... "	3.96	3.96
Cost of feed per steer for period..... \$	33.25	33.25
Cost of feed per pound gain..... cts.	12.6	11.7
Feed consumed per pound gain—		
Hay..... lb.	7.3	6.7
Silage..... "	21.8	20.3
Meal..... "	2.9	2.7
Price per cwt. realized May, 1922..... \$	7.10	7.50
Average value of steers May, 1922..... \$	69.79	87.81
Average profit per steer..... \$	4.17	5.73

The table shows that although the lighter steers cost one cent per pound less when purchased, yet the extra gains made by the heavier steers, coupled with the extra price realized on account of their superior finish when marketed, enabled them to make a gain of \$1.56 per steer over lot No. 1.

EARLY *versus* LATE GRAIN FEEDING OF STEERS

A question which often comes up in connection with the winter fattening of steers is the length of time during which grain should be fed in order to produce the most economical gains. With the object of securing some information on this subject, an experiment was begun in November, 1920, which will be carried on each year, until a definite conclusion can be arrived at. Eighteen grade Shorthorn steers are selected in the fall and divided as evenly as possible into three lots of six steers each. They all receive forty pounds of ensilage per head and as much hay as they can eat up clean. After grain feeding is begun the ensilage ration is gradually decreased. Lots No. 1 and No. 2 are fed meal from November 15 and January 15 onward, respectively, while the third lot receives only ensilage and hay until March 1. The meal mixture is made up of ground elevator screenings two parts and oats and bran one part each. During the last few weeks of feeding, cornmeal is used in place of oats. The steers are stabled the first week in November and marketed about the first of May. The averages of the results for two years are given in the following table:—

EARLY *vs.* LATE GRAIN FEEDING

	Lot No. 1	Lot No. 2	Lot No. 3
Number of steers in each lot.....	6	6	6
Number of months steers were stabled.....	6	6	6
Number of days grain was fed.....	169	109	61
Average weight per steer Nov. 1..... lb.	942.9	903.2	943.2
Average weight May 1..... "	1,216.3	1,131.3	1,155.4
Average gain per steer in 6 months..... "	273.4	228.1	212.2
Average daily gain..... "	1.53	1.27	1.13
Total amount of grain fed per steer..... "	1,003.0	671.0	414.0
Feed consumed per pound gain—			
Hay..... "	6.87	8.3	8.80
Ensilage..... "	17.44	20.97	22.48
Meal..... "	3.67	2.94	1.95
Average cost per steer November 1, at 5 cents per pound..... \$	47.15	45.16	47.16
Cost of feed per steer..... \$	33.74	29.77	25.38
Total cost per steer May 1..... \$	80.89	74.93	72.54
Value of steers May 1, at 7 cents per pound..... \$	85.14	79.19	80.88
Average profit over cost of feed per steer..... \$	4.25	4.26	8.34

The results shown in the foregoing table indicate that the steers in lots No. 1 and 2 made a greater average daily gain than those in lot No. 3. The latter, however, made their gains largely on cheap home-grown feeds, and, therefore, show a greater profit over cost of feed than either of the other two lots.

LOOSE *versus* TIED

This experiment has been conducted for several years and is an effort to determine whether steers when dehorned and allowed to run loose in box-stalls make as good gains as those tied up in the stable. The steers fed in pens were dehorned when purchased so there was no setback such as might have occurred if dehorning had been done shortly before they were stabled. Both lots received the same ration of hay, silage and meal. The meal mixture was made up of two parts of ground corn and one part each of ground oats, bran and ground barley. They were fed hay and ensilage for the first two weeks, after which two pounds of meal per day was fed and increased at the rate of one pound per month until the end of the feeding period, when they were getting seven pounds per day.



## LOOSE vs. TIED

	1919		1920		1921		1922		Average	
	Loose	Tied	Loose	Tied	Loose	Tied	Loose	Tied	Loose	Tied
Number of steers in each lot	10	10	10	10	10	10	10	10	10	10
Average weight Nov- ember 1..... lb.	838.0	853.7	878.0	932.6	877.5	1,038.8	725.0	947.5	829.6	943.2
Average weight May 1. "	1,056.5	1,060.0	1,187.0	1,234.0	1,130.5	1,251.9	1,029.0	1,235.0	1,100.8	1,195.2
Average gain in 6 months "	218.5	206.3	309.0	301.4	253.0	213.1	304.0	287.5	271.2	252.0
Average daily gain..... "	1.2	1.1	1.7	1.6	1.4	1.1	1.7	1.6	1.5	1.4
Feed required per pound gain—										
Hay..... "	8.6	9.1	5.8	6.0	7.7	9.2	5.9	6.2	7.0	7.8
Ensilage..... "	20.7	21.9	14.6	15.0	16.6	19.7	17.7	18.7	17.4	18.8
Meal..... "	3.3	3.5	1.9	1.9	3.3	4.0	2.6	2.8	2.2	3.0
Cost of feed per pound gain..... cts.	14.8	15.7	9.3	9.5	12.94	15.5	10.4	11.0	11.8	12.97

The table shows that independent of the saving in labour and equipment, dehorned steers wintered and fattened in large pens made cheaper gains each year.

## RECLEANED ELEVATOR SCREENINGS AS A MEAL RATION FOR FATTENING STEERS

In order to ascertain whether recleaned elevator screenings make a suitable meal ration for winter fattening of beef cattle, an experiment was undertaken with steers in the fall of 1920. Two lots of eight steers each were selected and fed the same hay and ensilage ration. Lot No.1 received a meal ration composed of equal parts of bran, corn, ground oats and barley, while lot No. 2 received ground screenings two parts and bran one part. The following table gives the average of two years' results:—

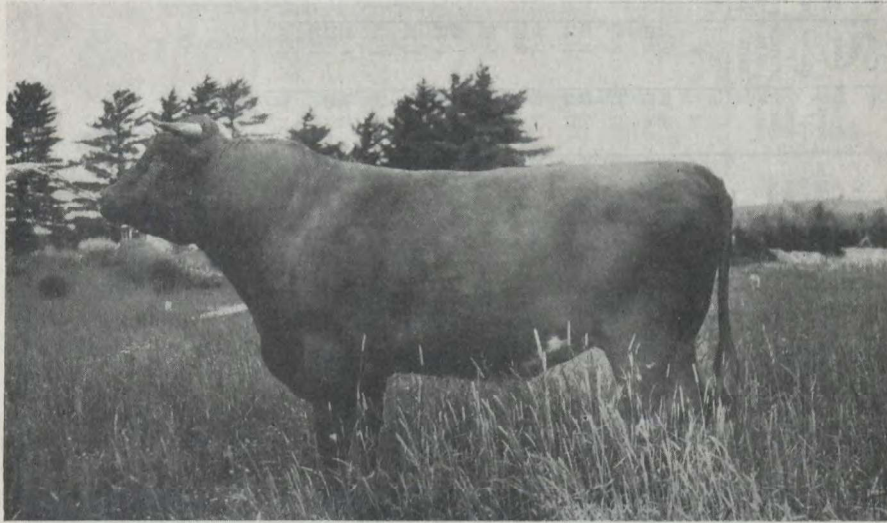
## TEST OF RECLEANED ELEVATOR SCREENINGS

	Lot No. 1	Lot No. 2
	fed corn, oats, barley and bran	fed screenings and bran
Number of steers in lot.....	8	8
Average weight Nov. 1..... lb.	993.1	936.0
Average weight May 1..... "	1,243.4	1,187.0
Average gain in 6 months..... "	250.3	231.0
Average daily gain..... "	1.44	1.23
Feed consumed per pound gain—		
Hay..... "	7.66	8.26
Ensilage..... "	19.24	20.03
Meal..... "	3.36	3.43
Cost of feed per pound gain..... cts.	12.85	12.45

As shown by the table, the steers fed screenings and bran made slightly cheaper gains. Screenings are a valuable feed when they can be bought at a reasonable price. Owing to their tendency, however, to vary in quality and weed seed content, they should be bought on a basis of analysis only. Ground screenings are too heavy and pasty for feeding alone, and, therefore, should be mixed with bran or ground oats to render them more digestible.

## SHORTHORNS

The herd consists of nine cows, one two-year-old heifer, two yearlings, four calves and the dual-purpose herd sire, "Weldwood Lassie's Lad"—135100—



Weldwood Lassie's Lad, —135100—, the dual-purpose Shorthorn bull heading the Lennoxville herd.

acquired from Weldwood herd of London, Ont. The dam of this sire has an official record, as a three-year-old, of 13,891 pounds of milk. With this excellent milk production behind him, and taking into consideration his size, length and excellent beef conformation, he is what might be called an ideal dual-purpose Shorthorn sire.

The beef conformation is a point that cannot be too strongly emphasized in the breeding of the dual-purpose Shorthorn.

As the females of the Lennoxville herd are practically all of Scottish breeding, the object of using a sire with milk production behind him is to see what improvement can be made in the milking qualities of the females of this breeding.

All young bulls raised are sold to farmers at reasonable prices.

## DAIRY CATTLE

## AYRSHIRES

The herd at present comprises thirty-eight head, namely, one stock bull, "Ottawa Master"—52603—sixteen cows, seven two-year-olds, three yearlings and eleven calves. All cows are entered in the Record of Performance and a large percentage have qualified. It is very encouraging to see the increased interest being taken in this district in Record of Performance work. There is practically no demand for young bulls of the dairy breeds unless they are from qualified dams. It is very noticeable that as soon as a breeder takes up record work he usually becomes a better feeder and gives his herd more thought and attention.

The Station herd is fully accredited at present.

Following will be found a table giving the amount of milk produced, butter fat test, feed consumed and cost to produce milk from Ayrshire cows which finished their lactation period in 1922:—

Dairy Records, 1922—Ayrshires

Name of cow	Age at time of calving	Date of dropping calf	No. of days in lactation period	Total pounds of milk	Daily average yield of milk	Average per cent fat	Pounds of butter produced	Value of butter at 34 cents per pound	Value of skim milk at 25 cents per cwt.	Total value of product	Meal and beet pulp eaten at 1 1/2 cts. per pound	Roots and silage eaten at \$4 per ton	Hay eaten at \$12 per ton	Green feed eaten at \$4 per ton	Months on pasture	Total cost of feed for period	Cost of feed required to produce 100 lb. milk	Cost of feed required to produce 1 lb. butter	Profit over cost of feed per cow
	yrs. m's.							\$	\$	\$	lb.	lb.	lb.	\$		\$	cts.	\$	
Pauline's Pride	5-9	Oct. 8, 1921	357	11,889.3	33.3	4.37	611.25	207.82	28.43	236.25	4,169	6,300	1,007	.....	5.5	86.68	0.73	14.0	146.57
Lennoxville	4-8	Nov. 26, 1921	331	9,970.6	30.1	4.40	516.13	175.48	23.83	199.31	4,802	7,215	1,064	.....	7.5	100.34	1.01	19.5	96.97
Roxie	9-8	Nov. 10, 1921	365	9,976.5	27.3	3.54	415.49	141.27	24.06	165.32	3,920	6,885	1,227	930	5.5	87.29	0.88	21.0	78.03
more.	3-9	Dec. 9, 1921	326	8,052.8	24.7	4.22	399.80	135.93	19.28	155.21	4,674	7,655	934	.....	5.5	96.52	1.20	24.0	58.69
Pearl	3-9	April 13, 1921	321	7,668.9	23.9	4.33	390.66	132.82	18.34	151.16	3,126	5,859	1,517	2,158	5.5	77.53	1.61	19.8	73.63
Marjorie	4-8	May 18, 1921	286	7,401.5	25.9	4.40	383.14	130.26	17.69	147.95	3,096	9,464	1,761	5,540	5.5	92.52	1.25	24.1	55.43
Lennoxville	5-1	Nov. 30, 1921	304	8,834.5	29.0	3.54	367.93	125.10	21.31	146.40	3,230	5,365	1,033	5,020	5.5	80.92	0.92	22.0	65.48
Bettina	2-7	Sept. 24, 1921	361	7,278.3	20.2	4.13	353.64	120.24	17.44	137.68	3,134	5,990	981	1,110	7.5	74.60	1.03	21.0	63.08
Dairymaid 2nd	4-4	May 11, 1921	324	7,367.7	22.4	4.01	347.58	118.18	17.68	135.86	3,150	7,857	1,481	5,540	5.5	88.43	1.20	25.0	47.43
Flo of Cloverside	3-1	April 21, 1921	285	7,133.1	25.0	3.94	330.64	112.42	17.13	129.55	2,961	6,443	1,186	5,540	5.5	81.00	1.14	24.5	48.55
Lennoxville	7-3	Dec. 11, 1921	324	7,721.7	23.8	3.63	329.76	112.12	18.60	130.72	4,464	7,915	1,064	.....	8.0	97.17	1.26	29.5	33.55
Daisy of Bridgeview	2-9	Jan. 26, 1921	245	5,208.6	21.5	5.14	318.60	108.32	12.49	120.81	2,371	5,727	808	.....	4.5	56.36	1.16	20.8	64.45
Lennoxville	2-4	July 13, 1922	252	5,975.8	16.9	4.37	307.22	104.45	14.29	118.74	2,561	6,000	1,341	2,160	7.5	70.28	1.18	22.5	48.46
Halcyone	4-9	Sept. 28, 1921	276	5,970.8	21.6	4.33	304.16	103.41	14.28	117.69	2,304	7,983	1,674	510	5.5	67.09	1.12	22.0	50.60
Lennoxville Susie	8	Nov. 30, 1921	389	5,730.0	14.7	4.30	289.87	98.56	13.71	112.27	2,723	5,165	2,258	570	5.5	71.37	1.25	24.6	40.90
Annabel																			
Hillcrest Duchess																			
Average			323	7,749.3	24.0	4.17	377.72	128.42	18.57	146.99	3,379	6,788	1,289	29,078	6.0	81.87	1.09	22.3	65.12

## COST OF KEEPING AYRSHIRE HERD BULL

Age of bull.....	6 years
Cost of Feed—	
1,915 pounds hay at 60 cents per cwt.....	\$11 49
5,210 pounds ensilage at 20 cents per cwt.....	10 42
1,874 pounds meal at \$1.50 per cwt.....	28 11
Total cost of feed.....	\$50 02

## COST OF FEED REQUIRED TO RAISE AYRSHIRE HEIFERS TO BREEDING AGE

Average weight at birth.....	54 pounds
Average weight at twenty-six months of age.....	850 pounds
Cost of Feed—	
Whole milk, 898 pounds at \$1.50 per cwt.....	\$13 48
Skim-milk, 3,922 pounds at 25 cents per cwt.....	9 55
Meal, 1,132 pounds at \$1.25 per cwt.....	14 15
Hay, 1,800 pounds at 60 cents per cwt.....	10 80
Roots, 28 bushels at 10 cents per cwt.....	2 80
Pasture, 6 months at \$1 per month.....	6 00
Total cost of feed for 26 months.....	\$56 78

## JERSEYS

There were purchased, from the principal Jersey herds of this district last spring, six females of excellent type and breeding as a nucleus of a herd of this



Lucinda's Prince,—126601 A., sire of Brampton Princess Lucy,—9459—, one of the Lennoxville Jersey herd.

dairy breed, which has been gaining in popularity in recent years in the St. Francis district.

## MILKING MACHINES

There are in operation at this Farm, two single unit Empire and one Macartney milking machines. The reason for using the single units is because all cows are on Record of Performance work. Both kinds have given satisfaction, but there are doubtless other makes on the market that have proven just as serviceable.

All heifers take very readily to this process of milking and very little udder trouble has arisen due to the effects of machine milking.

The principal points to be observed in getting satisfaction from a mechanical milker are, to see that it is kept in good repair, all parts, especially tubes, thoroughly cleaned, and to have a sufficient number of cows to make it worth while, which should be fifteen or more.

#### HORSES

There are, in all, sixteen horses at the Farm at the present time, including fourteen work-horses, one driver and one-three-year-old gelding. Two mares were purchased during the year, one horse sold and one mare exchanged. During the winter of 1922, two idle horses were kept in an open yard provided with a covered shelter for bad weather. They received hay, roots and a small quantity of grain each day and were in good condition when brought to the stable the latter part of March. This method of wintering idle horses has been practised every year and has proved very satisfactory. The two mares purchased in April were sent to pasture the first of June and taken to the stable in September before the fall work was begun.

#### COST OF HORSE LABOUR

In order to arrive at the cost of labour supplied by the horses kept on the Farm, everything pertaining to their upkeep had to be considered. Interest was charged on investment in horses, buildings, harnesses and stable equipment. As a horse was considered to have reached his maximum value at eight years of age, ten per cent depreciation was charged on the value of all horses over eight years old. The following statement shows how the cost of one hour's horse labour was arrived at:—

#### COST OF HORSE LABOUR

Number of work-horses.....	14	
Average value of each horse.....	\$200 00	
Hours work done during year.....	22,897	
Average number of hours labour per horse.....	1,635.5	
Average number of 10 hours worked per horse.....	163.6	
Cost of Feed—		
80,850 pounds hay at 60 cents per cwt.....	\$ 485 10	
45,768 pounds oats at \$1.60 per cwt.....	732 29	
8,333 pounds bran at \$1.10 per cwt.....	91 66	
5,840 pounds corn and oats (ground) at \$1.50 per cwt.....	87 60	
Three months' pasture for 2 horses at \$1 per month.....	6 00	
Total cost of feed for 14 horses for 12 months.....	1,402 65	
Average cost of feed per horse for 12 months.....	100 19	
Cost of feed required to produce 1 hour of labour.....	6.1 cents	
Cost of feed for 14 horses.....	\$1,402 65	
Veterinary fees and medicines.....	20 00	
Horse shoeing.....	158 85	
Repairs to harnesses.....	99 63	
Brushes, sweat pads, etc.....	24 88	
Stableman's labour, 2,555 hours at 31 cents per hour.....	792 05	
Interest on investment \$5,000 for one year at 5 per cent.....	250 00	
Ten per cent depreciation in value of horses over 8 years.....	180 00	
Eight per cent depreciation in value of harnesses.....	56 00	
Five per cent depreciation in value of buildings.....	75 00	
	\$3,059 06	
Less value of manure.....	40 00	
Total cost of 22,897 hours horse labour.....	\$3,019 06	
Cost of one hour horse labour.....	13.2 cents	



## SHEEP

The flock of sheep at the Farm on December 31 numbered seventy-two head, including the aged Oxford ram, "Bruce"—13130—, thirteen pure-bred Oxford ewes, thirty-four grade Oxford ewes, and twenty-four lambs. Sixty-four head were kept over the winter of 1922, of which fifty-two were breeding ewes. The lambs began to arrive about the first of April and were practically all dropped before the sheep were sent to pasture on April 26. Shearing was done about the middle of April, the sixty-four fleeces averaging 8.9 pounds each. The wool, which was sold through the Canadian Co-operative Wool Growers' Association, and paid for according to grade, realized an average price of \$2.13 per fleece. Sheep and lambs were dipped, all lambs docked and the ram lambs, intended for market, castrated. The lambs were weaned in August and transferred to clover pasture on which they made very good gains. Of the fifty-five lambs saved, four rams were sold to neighbouring farmers for breeding purposes, one ram was kept, fifteen ewe lambs were selected for breeding stock and the remainder marketed. The average weight of the lambs when weighed in November was 110.5 pounds each. Twelve old ewes were culled out of the breeding flock and sold on the local market at an average price of \$8.12 each. It has been found to be a good practice to have at least two pasture fields, so that the sheep can be moved from one to the other during the summer. This helps to prevent lung worms, the sheep make better gains, and, besides, less injury is done to the pasture by close cropping.

Sheep are usually healthier and make better gains on upland pastures than on low-lying wet ground. Careful feeding during the winter, proper attention to ewes and lambs at lambing time, and plenty of good pasture during the summer were largely responsible for the good returns from the farm flock this year.

## COST OF RAISING LAMBS TO MARKET AGE

In order to obtain the cost of lambs at the time they were ready for market, the cost of carrying the breeding flock over for one year had to be taken into account. This included feed for the ewes and ram for one year, less the value of the fleeces, pasturage, interest on investment and depreciation in value of the ram. No charge was made for housing or the ordinary labour of feeding the flock during the winter, as the value of the manure was considered sufficient to offset those costs. Depreciation at the rate of \$15 per year was charged against the ram. No charge for depreciation was made against the ewes, however, as the value of the old sheep when marketed this year was considered sufficient to cover the cost of raising a sheep to breeding age. The lambs are charged for pasture at the same rate as the sheep, from weaning time until they were ready for market.

## COST OF RAISING LAMBS TO MARKET AGE

Number of breeding ewes November 1, 1921.....	52
Value of breeding ewes at \$15 per ewe.....	\$780 00
Number of lambs saved.....	55
Average number of lambs saved per sheep.....	1.05
Average weight of lambs at birth.....	Lb. 9.5
Average weight of lambs when weaned.....	" 86.3
Average weight of lambs when ready for market.....	" 110.5
Average value per lamb 110.5 pounds at 11 cents per pound.....	\$ 12 15
Cost of Feed for 52 ewes—	
7 tons hay at \$12 per ton.....	84 00
6,685 pounds ensilage at 20 cents per cwt.....	13 37
8,731 pounds roots at 20 cents per cwt.....	17 46
1,272 pounds whole oats at \$1.60 per cwt.....	20 35
1,669 pounds meal at \$1.50 per cwt.....	25 04
6 months' pasture at 20 cents per month per sheep.....	62 40
Total cost of feed for 52 sheep for one year.....	\$222 62
Average cost of feed per sheep for one year.....	4 28
Average weight of fleece.....	Lb. 8.9
Average value of fleece.....	\$ 2 13
Average cost of feed per sheep less value of fleece.....	2 15

## COST OF RAISING LAMBS TO MARKET AGE—Concluded

Cost of ewes' feed charged against lambs 52 sheep at \$2.15 per head.....	\$111 80
3 months' pasture for 55 lambs at 20 cents per head per month.....	33 00
Cost of feeding ram (less value of fleece).....	12 59
Depreciation in value of ram.....	15 00
Interest on investment \$840 for one year at 5 per cent.....	42 00
Cost of extra care during lambing time.....	21 00
Medicine, etc.....	5 00
Total costs for 55 lambs.....	\$240 39
Average cost of raising a lamb to market age.....	4 37

## SWINE

Only one breed of swine, the Yorkshire, is kept at this Station. The herd consists of the herd boar, "Glenhodson Emperor F" —69124—, four sows, three gilts and thirty-one experimental feeders. Each of the four sows had two litters during the year, from which seventy-four young pigs were saved. Of these, nineteen were sold to neighbouring farmers for breeding stock, three young sows were kept for breeding purposes on the Farm and the remainder used for experimental work.

## COST OF RAISING YOUNG PIGS

The following statement is made up from the records of four Yorkshire brood sows kept at the Farm during 1922. Each of the sows had two litters during the twelve months. No pasture was available for hogs during the summer, so the cost of feed was higher than on the average farm. The ordinary meal ration of the sows consisted of three parts ground wheat screenings, one part beet pulp and one part bran. Clover hay was fed regularly and roots when available. The sows were kept in hog cabins in the yard, summer and winter until just before farrowing time, when they were removed to the hog barn. The meal ration then was made up of middlings 100 pounds, ground oats 80 pounds, cornmeal 50 pounds and beet pulp 50 pounds. Skim-milk was fed when it could be obtained, otherwise a little oilmeal was added to the meal ration. The young pigs from three to six weeks of age received ground oats fed in the hopper and sweet skim-milk in addition to the mother's milk. Small quantities of sulphur, charcoal and salt were added at all times to the meal ration of the sows.

## COST OF RAISING YOUNG PIGS TO WEANING AGE

Number of sows bred.....	4
Total number of young pigs farrowed.....	91
Total number of young pigs saved.....	74
Average number of pigs farrowed per sow.....	22.3
Average number of pigs saved per sow.....	18.5

## COST OF FEED FOR SOWS FOR ONE YEAR AND FOR YOUNG PIGS FROM BIRTH TO SIX WEEKS OF AGE

2,640 pounds middlings at \$1.50 per cwt.....	\$ 39 60
2,325 pounds wheat screenings at \$1.25 per cwt.....	29 06
2,636 pounds ground oats at \$2 per cwt.....	52 72
1,764 pounds bran at \$1.10 per cwt.....	19 40
690 pounds cornmeal at \$1.50 per cwt.....	10 35
690 pounds beet pulp at \$1.25 per cwt.....	8 63
105 pounds oil-meal at \$2.50 per cwt.....	2 63
228 pounds clover hay at 50 cents per cwt.....	1 14
35 bushels roots at 10 cents per bushel.....	3 50
8,263 pounds skim-milk at 25 cents per cwt.....	20 65
Charcoal, sulphur and salt.....	2 00
Total feed used during year by sows and young pigs.....	\$189 68

To obtain the cost of raising young pigs to six weeks of age all charges against the sows, with the exception of labour and housing charges, were considered. An average value of \$50 per sow was given in order to obtain the interest charge.

Total cost of feed for sows and young pigs.....	\$189 68
Extra labour at farrowing time.....	24 00
Cost of service at \$2 per service.....	16 00
Interest on \$200 for one year at 5 per cent.....	10 00
	\$239 68
Total cost of raising 74 young pigs to weaning age.....	3 24
Average cost of young pigs at weaning age.....	

## FIELD HUSBANDRY

The season of 1922 was a favourable one, on the whole, throughout the Eastern Townships, for field crops and pastures. The frost came out of the ground during the first week in April, but owing to the cool, dark weather which followed, very little field work, other than spring ploughing, was done before the 24th. May was a fine month, however, and favourable for seeding operations. June was very wet, the rainfall for the month being 10.34 inches. Grain, hay, sunflowers, roots and pastures came on well, but corn suffered during the wet weather, which hindered proper cultivation and allowed the weeds to get a start. Considerable damage was done to crops on the field husbandry experimental area by a rainstorm which occurred during the night of June 21. Rows of corn were washed out in the drainage experiment and sand and gravel from the road were carried on to the plot ground. July followed with three weeks of very fine weather which facilitated hay making. Grain ripened during the first two weeks in August, but was damaged somewhat throughout the district by bad weather and smut. September, October and November were fine months and favourable for all kinds of fall work. The first killing frost of the season occurred the night of September 18 and did some damage to standing corn. The ground did not freeze up, however, until the last week of November, and consequently more than the average amount of fall ploughing was done.

## YIELD AND COST OF PRODUCING CORN ENSILAGE

The yield of ensilage corn, on the general farm rotation, was below the average in 1922. This was due, mainly, to the extremely wet weather during June and the first part of July, which checked growth and prevented proper cultivation.

The corn land was ploughed in the fall of 1921 and manured during the winter, at the rate of sixteen tons of barnyard manure per acre. This was supplemented by an application of commercial fertilizers, made up of 100 pounds nitrate of soda, 400 pounds acid phosphate and 150 pounds muriate of potash, applied along the rows with the corn planter at the rate of 250 pounds to the acre. The corn was planted on May 25 and 26 in rows 42 inches apart, after which the ground was harrowed at intervals until the plants were two or three inches in height. Frequent cultivation before the corn was high enough to be injured by the harrows prevented the ground from hardening and retarded the growth of weeds. Several varieties of corn were sown, but the best results were obtained with Compton's Early, which was the most mature and gave the highest yield when cut. Harvesting was done from the 14th to the 16th of September, 14.5 acres producing an average yield per acre of 9 tons, 500 pounds.

A four-year rotation of corn, oats, clover and timothy is practised at the Lennoxville Station. When working out the cost of producing the different farm crops, it was estimated that in such a rotation, forty per cent of the value of the manure is used up by the corn, thirty per cent by the grain, twenty per cent by the clover and ten per cent by the timothy. As both manure and fertilizers were applied to the corn, for the sake of making the calculations less complicated the value of the two applications were considered to be equal to twenty tons of barnyard manure. This was charged against the different crops at the rate of \$1 per ton, which was considered to be sufficiently high to cover the cost of handling and hauling. The following table is a statement of the cost of producing an acre of corn in a five-acre field, which gave the nearest approach to an average yield at the Station this year:—

COST PER ACRE OF PRODUCING ENSILAGE CORN

Item	Statement	Amount
Rent of land.....	\$100 per acre at 7 per cent.....	\$ 7 00
Manure.....	8 tons at \$1.....	8 00
Seed.....	½ bushel at \$1.80.....	0 90
Machinery.....		3 00
Twine.....	3.5 pounds at 16 cents.....	0 56
Manual labour.....	42.3 hours at 30 cents.....	12 69
Horse labour.....	50.4 hours at 13 cents.....	6 55
Total cost per acre.....		38 70
Yield per acre.....	12.7 tons.	
Cost per ton.....		3 05

Corn ensilage is not a marketable crop and, therefore, it is often a puzzle for the average farmer to determine, even if he knows the cost of production, whether he is raising his crop at a profit or at a loss. In his report for 1921, the Dominion Field Husbandman gives a method of computing the value of ensilage, based on the market value of hay. One ton of hay contains 1,760 pounds of dry matter, which this year is worth \$15 per ton. One pound of dry matter in hay is, therefore, worth .85 of a cent. He estimates that the dry matter in ensilage corn has a feeding value of eleven per cent more than the dry matter in hay. Working on this assumption, therefore, a pound of dry matter in corn is worth .94 of a cent, which would give a ton of corn ensilage containing 500 pounds of dry matter, a value of \$4.70. Deducting the cost of production, which was \$3.05, would leave a net profit per ton of \$1.65, or a net profit per acre of \$20.96.

## YIELD AND COST OF PRODUCING SUNFLOWER ENSILAGE

Sunflowers grown alone for ensilage, gave a yield of 21.4 tons per acre on a low-lying field, containing 3.5 acres, which had been under hay for several years. The soil was by no means lacking in fertility, however, as it gets the wash from the higher ground during heavy rains. It is also flooded by the river each spring. This accounts, no doubt, for the high yield of sunflowers obtained this year, in spite of the fact that only a comparatively light dressing of commercial fertilizers and manure was applied. The land was spring ploughed and received a light dressing of barnyard manure, fifteen tons in all, on the poorer portions of the field. A mixed fertilizer, similar in composition to that applied to the corn, was spread along the rows, at the rate of 400 pounds per acre, after the sunflowers were sown. This was incorporated with the soil by subsequent harrowing. The seed was sown with the corn planter in drills, 42 inches apart, at the rate of ten pounds per acre. Planting was done on May 30 and

harvesting on the 20th and 21st of September, when over sixty per cent of the plants were in bloom. The growth was so tall and rank, however, that most of it had to be cut by hand.

Adjoining the main sunflower field was an acre of sandy loam, which received a dressing of twenty tons of barnyard manure and was sown to swedes. A very poor stand of roots was obtained, and the field was ploughed up and resown to sunflowers on June 28. This crop was harvested with the corn binder on September 18, when the plants were about fifteen per cent in bloom. The yield from one acre was 19 tons. The crop was much more easily handled and the quality of the ensilage was much better than where the plants were allowed to reach a greater stage of maturity.

The value of the sunflower as an ensilage crop has attracted a great deal of attention lately, especially in districts where corn does not always give a satisfactory yield. There is no question but that sunflowers will thrive under a greater variety of soil and climatic conditions than corn. If cut at the right stage, it produces an ensilage, almost, if not equal to corn ensilage, for feeding value and palatability. A good rate of seeding for sunflowers is from eight to ten pounds per acre. This can be sown with the corn planter, in rows 42 inches apart. During the summer it requires the same cultivation as corn.

In the following table a statement is given of the cost of producing sunflower ensilage in the acre field sown on June 28. The different cost items are charged at the same rate as for corn:—

COST PER ACRE OF PRODUCING SUNFLOWER ENSILAGE

Item	Statement	Cost	
		\$	cts.
Rent of land.....	\$100 an acre at 7 per cent.....	7	00
Manure.....	8 tons at \$1 per ton.....	8	00
Seed.....	10 pounds sunflower seed at 9 cents.....	0	90
Machinery.....	Interest and depreciation.....	3	00
Twine.....	4.5 pounds at 16 cents.....	0	72
Manual labour.....	85.7 hours at 30 cents.....	25	71
Horse labour.....	65 hours at 13 cents.....	8	45
Total cost per acre.....		53	78
Yield per acre.....	19 tons.		
Cost per ton.....		2	84

YIELD AND COST OF PRODUCING OATS

The average yield of 58 acres of oats grown at the Station in 1922 was 42.4 bushels per acre. Sowing was done from May 2 to May 11, and harvesting from August 14 to September 4. The variety used was Banner, which was sown at the rate of three bushels per acre. All the seed grain was treated with formalin before sowing. There was, therefore, no trouble from smut, although the season was favourable for the spread of all kinds of fungus diseases. The grain ripened well, but harvesting was difficult, due to the unfavourable weather in August. Threshing was done as the grain came in from the field and the straw cut before it was stored.

The following table contains a statement of the cost of producing oats in a 22-acre field, on which careful records of costs and yields were kept. This field had been under corn in 1921, the soil was in a good state of fertility and, therefore, the yield was somewhat higher than on some of the other fields. As it is included in the general farm rotation, it was considered to be more typical of the farm land in this district than the fields which are used for experimental work:—



## COST OF PRODUCING ONE ACRE OF OATS

Item	Statement	Cost
Rent of land.....	\$100 an acre at 7 per cent.....	\$ 7 00
Manure.....	6 tons at \$1 per ton.....	6 00
Seed.....	3 bushels at \$1.10.....	3 30
Machinery and threshing outfit.....	Depreciation and interest charges.....	3 00
Twine.....	4.5 pounds at 16 cents.....	0 72
Manual labour.....	20.5 hours at 30 cents.....	6 15
Horse labour.....	29.3 hours at 13 cents.....	3 81
Total cost per acre.....		\$ 29 98
Less value of straw.....	0.8 tons at \$7.....	5 06
Cost of grain per acre.....		\$ 24 38
Yield per acre.....	46.1 bushels.	
Cost of grain per bush.....		52.9 cts.

At the time of writing, western feed oats are quoted on the local market at 54 cents per bushel. This leaves a profit per acre of only 51 cents, which does not seem to be a very strong argument in favour of growing more grain in this section of the country. However, it must be considered that the man who raises oats at that price gets paid for his own labour and the labour of his horses, besides realizing a good rate of interest on the money invested in land and implements.

## YIELD AND COST OF PRODUCING HAY

The yield of clover in 1922 was below the average throughout this section of the country, owing to the poor catch secured in 1921. Many farmers were compelled to plough up their newly seeded ground and sow an annual hay crop, such as, oats, peas and vetches, or millet. Where clovers withstood the rigours of the previous season, the growth was backward until well on into June. The continued wet weather, which prevailed during the early part of the summer was ideal for the growth of hay, and gave the newly seeded ground the chance it needed. It was not so good, however, for curing hay, and it was not until the second week in July that haying was begun at this Station. One field, containing sixteen acres of clover, was cut during the latter part of June and put in the silo. It is turning out of the silo in good shape, and is used for feeding to steers. They seem to relish it as well as corn or sunflower ensilage. An average yield of 1.9 tons of hay was secured in 1922 at the Lennoxville Station from 146.4 acres.

Many farmers throughout the Eastern Townships claim that they cannot get clovers to do well on their land. This is probably due to the fact that most of the soils in this district are decidedly acid. This can be corrected by applications of lime. Ground lime stone can usually be obtained at a fairly reasonable price, and should be applied at the rate of two tons per acre. One application is sufficient to correct the acidity in the soil for several years. The addition of two or three pounds of alsike to the seeding mixture will also help to improve the quality of the hay produced on acid soils.

More hay is produced each year at the Station than the stock can utilize during the winter, therefore, the second crop of clover is usually pastured. The following statement is made up from the records kept on an 18-acre field, which was under first year hay in 1922. The hay contained a large percentage of red clover and was housed in good condition. No second cutting was taken off this field:—

## COST PER ACRE OF PRODUCING HAY

Item	Statement	Cost
Rent of land.....	\$100 per acre at 7 per cent.....	\$ 7 00
Manure.....	4 tons at \$1 per ton.....	4 00
Seed.....	Red clover, 10 pounds at 30 cents.. \$3 00	
	Alsike, 2 pounds at 31 cents..... 0 62	
	Timothy, 8 pounds at 12 cents..... 0 96	
	2)4 58	
	2 29	2 29
Machinery.....		3 00
Manual labour.....	15 hours at 30 cents.....	4 50
Horse labour.....	13.9 hours at 13 cents.....	1 81
Total cost per acre.....		\$ 22 60
Yield per acre.....	2.3 tons.	
Cost per ton.....		\$ 9 83

## PASTURES

There are, in all, 223 acres of permanent pasture land at the Station, of which approximately 100 acres could be cultivated. During the summer, thirteen acres were cleaned and ploughed. Next year various methods of fertilizing and seeding will be tested out on this area. The wet weather in June and August was ideal for the growth of grasses and helped to revive pasture land which suffered from the drought of the previous season.

There are large areas of permanent pasture land throughout the Eastern Townships which have, in the past, afforded cheap feed for all classes of live stock. Of late years, however, they have been allowed to grow up to bracken, hard hack and scrub timber and produce only a very poor quality of grass.

Experiments with various seeding mixtures, methods of cultivation and fertilizing are under way at the Lennoxville Station, but results are not yet available.

## CORN AND SUNFLOWER MIXTURES

An experiment was begun last season with the idea of determining the most suitable mixture of corn and sunflowers to grow for ensilage purposes. The land was ploughed the previous fall and received a dressing of barnyard manure during the winter at the rate of twenty tons per acre. This was supplemented by an application of commercial fertilizer, broadcasted on the land in the spring, at the rate of 350 pounds per acre. It contained nitrogen 2 per cent, phosphoric acid 6 per cent and potash 9 per cent. The mixtures were planted on one-hundredth acre plots containing two rows each three feet apart. The duplicates were planted in hills three feet each way. As a further check, corn and sunflowers were grown separately in alternate hills and thinned to four plants per hill. Compton's Early was the variety of corn and Mammoth Russian the variety of sunflowers used in this experiment.

## CORN AND SUNFLOWER MIXTURES

	Rate of Seeding per Acre		Per cent Stand by Weight		Yield per Acre		
	Corn	Sunflowers	Per cent corn	Per cent sunflowers	Rows	Hills	Average
	Peck 1	Pounds			Tons Lb. 19 1,400	Tons Lb. 20 300	Tons Lb. 19 1,850
Corn (Compton's Early).....							
Sunflowers (Mammoth Russian).....		8			29 300	28 300	28 1,300
Corn and sunflowers.....	1	1	58	42	23 1,800	25 1,500	24 1,650
Corn and sunflowers.....	1	2	45	55	26 1,700	25 1,600	26 650
Corn and sunflowers.....	1	3	26	74	28 500	28 900	28 700
Corn and sunflowers.....	1	4	17	83	27 1,900	28 300	28 100
Alternate hills.....	1	2½	32	68	25 1,600	24 1,800	25 700
					25 1,886	25 1,814	25 1,850

The above table shows that sunflowers grown alone gave the highest yield per acre. Of the mixtures, the one containing three pounds of sunflowers to the peck of corn gave the highest yield. It was found that as the amount of sunflowers in the mixture increased, the corn was shaded and crowded and did not have a chance to mature. Where sunflowers are grown along with corn, the best results are usually obtained by planting two pounds of sunflower seed to the peck of corn. This produces a crop containing a large percentage of corn by weight, and one which is more easily harvested than where the sunflowers predominate.

## NEW FIELD HUSBANDRY EXPERIMENTS

The experiments in field husbandry begun at the Lennoxville Station in 1922, on which no detailed report is given, include:—

- (1) A comparison of different rotations.
- (2) The cost of producing crops on drained versus undrained land.
- (3) Plot experiments with fertilizers, green manures and different methods of soil cultivation.

The rotation experiment includes a four year grain and hay rotation in addition to three-, four-, five- and six-year rotations with corn as the intertilled crop. The different rotations are compared, side by side, in a fairly uniform, level field, the plots being three-quarters of an acre each in size.

The drainage experiment is carried out on two fields, with the same slope and soil conditions. One field is underdrained, while the other has only natural drainage. A four year rotation containing corn, oats, clover and timothy is run on each field. Careful records of costs and yields will be kept to show the advantage, if any, of underdrainage.

The plot experiments with fertilizers, green manure crops and cultural methods, will be carried on in a fairly level, uniform field on the Ward Farm. It will be several years, however, before definite information from these experiments will be available for publication.

## HORTICULTURE.

### THE SEASON

The winter of 1921-22 was not unusually severe and the ground was covered with snow until well into March. Owing to the very dry season of 1921 strawberry plants were in poor condition when winter set in and as a result winter-killing was quite severe. All other horticultural crops wintered well and many varieties of apples and ornamental shrubs, that have always shown some injury, came through in perfect condition. For the first time since the orchard was planted, no complete winter-killing of an apple tree was observed.

Early spring was backward and although the frost was out of the ground, sufficiently to permit ploughing by April 10, it was impossible to obtain a good seed-bed before May 1. During May the weather was all that could be desired, but June provided the greatest precipitation experienced in a single month at this Station. Flooding caused damage to the vegetable garden and ornamental grounds, and the damp cloudy weather favoured the development of fungus diseases. July, August and September were average as regards rainfall and sunshine, although the recorded temperatures were lower than usual. As a consequence crops such as tomatoes and sweet corn, which require heat and sunshine to a considerable extent, were backward and did not do well. On the other hand the more hardy vegetables as represented by cabbage, celery, beets, carrots, etc., did exceptionally well.

There was no killing frost between May 24 and September 18, although on September 8 the thermometer registered 32 degrees, but no frost injury was observed. This is in some respects a record for the district as there is usually one killing frost during June.

### VEGETABLE TESTS

#### POTATOES

Nine varieties of potatoes were tested in duplicate plots of one-hundredth acre each. The sets were cut from medium sized potatoes and contained at least two eyes each. All of the seed potatoes used were grown at this Station the previous season. Planting was done on May 30, the sets being dropped twelve inches apart in the row and the rows spaced thirty inches apart.

The crop received thorough cultivation during the season and was sprayed with Bordeaux mixture five times. Good control of the potato and blister beetle was obtained by adding one and a half pounds of calcium arsenate to forty gallons of Bordeaux mixture at three of the sprayings. All varieties were dug on September 28 and graded into marketable and unmarketable. The results are shown in the accompanying table:—

POTATOES—TEST OF VARIETIES

Variety	Average Yield from Two One-hundredth Acre Plots			
	Marketable		Un-marketable	
	Bush.	Lb.	Bush.	Lb.
Green Mountain.....	352	10	55	20
Irish Cobbler.....	318	20	75	10
Kerr Pink.....	129	20	95	10
Great Scott.....	122	25	86	20
King George.....	115	15	68	10
Rose of the North.....	100	15	75	20
Edzell Blue.....	98	40	71	30
Masterpiece.....	96	15	100	20
Early Ohio.....	67	30	79	10

The results obtained by the past season's work have merely confirmed those indicated in former seasons and demonstrate clearly that Green Mountain, as a main crop, and Irish Cobbler, for early use, is a very satisfactory combination for the Eastern Townships. In addition they are the main commercial varieties and the small grower will find little difficulty in disposing of his surplus, whereas, stocks of other varieties may prove hard to get rid of.

*Potato-Spraying Experiment.*—This experiment has been conducted for the past three years with a view to determining the comparative value of some of the most popular commercial insecticides used in combination with Bordeaux mixture, or otherwise as recommended, as a control for the potato beetle. Applications of each spray were made on separate plots, at necessary intervals throughout the season, and their killing power determined by a count of beetles, on a few vines, before and twenty-four hours after spraying. At the end of the season a further determination of the value of the insecticide, as evidenced by the effect on the plant development, was obtained by weighing the crop produced on each plot. The following table shows the results for the past season:—

POTATO SPRAYING EXPERIMENT

	Average per cent of beetles and slugs killed by four applications	Yield per Acre			
		Marketable		Un-marketable	
		Bush.	Lb.	Bush.	Lb.
Calcium arsenate, 1½ pound to 40 gallons of Bordeaux.....	97	310	..	30	20
Pyrox, 8 pounds to 40 gallons of water.....	87	270	10	30	40
Arsenate of lead paste, 3 pounds to 40 gallons of Bordeaux..	82	260	10	40	30
Arsenate of lead, dry, 1½ pound to 40 gallons of Bordeaux..	84	250	30	40	20
Paris green, 8 ounces to 40 gallons of Bordeaux.....	89	230	20	50	10
Plant food, 5 gallons to 40 gallons of water and 1½ pound dry arsenate of lead.....	86	220	..	30	20

The results obtained in 1922 are in close accord with those of former years and indicate that the most complete and effective killing, as well as the best crop of potatoes, is obtained by the use of calcium arsenate at the rate of one and a half pounds to forty gallons of Bordeaux mixture.

*Comparison of Different Kinds of Potato Sets.*—Four different kinds of potato sets were tried; whole small potatoes under two inches in diameter, and pieces cut to one, two and three eyes each. The results for 1922 are as follows:

Kind of Set	Yield per Acre			
	Marketable		Unmarketable	
	Bush.	Lb.	Bush.	Lb.
Sets cut to two eyes.....	220	10	20	40
Sets cut to three eyes.....	210	20	50	10
Small whole potatoes.....	180	40	70	10
Set cut to one eye.....	150	30	10	30

The past season was the seventh consecutive year that this experiment has been conducted and the results, over the entire period, clearly indicate that the larger the size of set used the greater the total crop. Two eyes has given the greatest yield of marketable potatoes and if the cutting of seed is carefully done it should prove the best course to follow. Generally speaking, therefore, it would seem advisable to use seed cut to at least two good eyes each.



## ONIONS

Twenty-six varieties of onions have been tested since 1915 and during the past season fourteen were grown. Results of the best varieties that have been tested for the past three years are as follows:—

ONIONS—TEST OF VARIETIES

Variety	Colour	Shape	Yield from two 30-foot rows 3 year's average	
			Lb.	Oz.
Extra Early Flat Red.....	Red.....	Flat.....	31	..
Giant Prize Taker.....	Yellow.....	Oval.....	29	..
Red Wethersfield.....	Red.....	Slightly flat.....	24	..
Ailsa Craig.....	Yellow.....	Oval.....	24	..
Yellow Globe Danvers.....	Yellow.....	Oval.....	23	5

White Barletta, a small white variety, suitable for pickling, has given an average yield for the past three years of fourteen pounds from two thirty-foot rows. It is the best variety for pickling that has been tested at this Station so far.

*Transplanting Onions.*—Seed of Extra Early Flat Red, Giant Prize Taker, Red Wethersfield and Yellow Globe Danvers was started in flats in the hotbed on April 6. The plants were pricked out on April 29 and transplanted to the field on May 8.

The relative standing of the varieties in this test was the same as the three-year average of seeding in the open, but the crop matured three week's earlier and the yield was forty-eight per cent greater. Each of the varieties tested seems to be satisfactory for transplanting.

## GARDEN CARROTS

*Test of Varieties.*—Of the five varieties tested only one, an Ottawa selection of Chantenay, may be called a variety. The others were practically the same throughout, as all were composed of several different types. Comparisons between varieties of such pronounced ununiformity are impossible. Chantenay 0-206-9, a selection made at the Central Experimental Farm, Ottawa, is a good uniform variety and one well suited to this district.

## GARDEN BEETS

*Test of Varieties.*—Seed of eight varieties was sown in rows, thirty feet long and twenty-four inches apart, on May 6. Each variety occupied two rows. A perfect stand was obtained and this, together with the favourable season, made it possible to obtain a good comparison. Crosby Egyptian is without doubt the best variety tested from the market gardener's standpoint. The roots are of medium size, deep colour and excellent quality. Detroit Dark Red is the best second choice.

## PARSLEY

*Test of Varieties.*—Two varieties, Moss Curled and Triple Curled, were grown. The former produced the finest parsley and the heaviest yield.

## EGG PLANT

New York Purple, a very early variety was tried. The seed was started in the hotbed on April 3, and the plants transplanted to the garden May 15. A good crop set, but most of it was killed by frost while still green.

## HERBS

Small areas of Summer Savory and Winter Sage were grown. Each produced a satisfactory crop. Sage was also planted, but did not do well.

## ASPARAGUS

Owing to the moist wet June, asparagus did unusually well. A variety known as Washington was grown and from the results obtained it seems an excellent choice for the Eastern Townships.

## RADISH

*Test of Varieties.*—Six varieties were tested in thirty-foot rows and, as the season was exceptionally favourable, excellent results were obtained. XXX Scarlet Oval was the best variety tested. The quality of the radish was excellent and the size ideal for marketing. Improved French Breakfast proved a good second choice. It was the earliest variety tested and of good quality, but a little small for the best market standard.

## SWISS CHARD

A variety known as Silver Leaf was grown in rows two feet apart. The seed was sown on May 8 and the plants thinned to six inches apart in the row on June 5. It was ready for use by the third week in July. After cutting it grew up again quite rapidly and a total of four cuttings was possible throughout the season. It proved an excellent vegetable to follow summer spinach.

## SPINACH

Two varieties were tested, Victoria, an early summer sort, and New Zealand, a late variety. Both varieties are quite suitable for the district and when both are planted, a good succession of crop is possible.

## PEPPERS

*Test of Varieties.*—Two varieties of the large sweet peppers and two of the small sort were tested. Harris Early proved to be the earliest and best sweet pepper, being ready for use on July 20, and yielding twenty-four pounds of crop from two thirty-foot rows. Small Red Chili was ready for use on September 12 and produced eight pounds of ripe peppers from two thirty-foot rows, before frost. It is the best small pepper for the district.

## GARDEN PEAS

*Test of Varieties.*—Since 1915 thirty-one varieties of garden peas have been tested, and, although it has been impossible to secure good seed of all varieties each year, a good many have been under test for five or more years. Those that have proved most satisfactory, as regards quality and yield, over a period of five years are shown in the following table:—

GARDEN PEAS—AVERAGE OF FIVE YEARS

Variety	Season	Height		Yield of unshelled pods from 30-foot row	
		Ft.	In.	Lb.	Oz.
Thomas Laxton.....	Early.....	2	6	16	3
Telephone.....	Late.....	4	..	14	..
Stratagem.....	Late.....	3	..	13	9
Gradus.....	Early.....	2	6	13	3
Sutton Excelsior.....	Mid season.....	1	8	12	9
American Wonder.....	Early.....	1	4	10	6

Other promising varieties have been under test for shorter periods, but, so far, do not show marked superiority over the best of those mentioned in the preceding table.

#### IMPROVEMENT BY SELECTION OF THE GRADUS VARIETY

With a view to improving the yield, and at the same time maintain the earliness and excellent quality of the Gradus variety, improvement by selection was started during the past season. Two hundred individual plants were grown in rows two feet apart with eighteen inches between the plants in the row. Considerable variation was noted and seed was saved, for further work, from a number of promising individuals.

#### PUMPKINS

*Test of Varieties.*—Pumpkins were the only species of the gourd family that produced a normal crop. Three hills each, of four varieties were grown. The yields were as follows: Connecticut Field, 253 pounds; Large Cheese, 182 pounds; Small Sugar, 172 pounds; and Quacker Pie, 101 pounds.

#### CUCUMBERS

*Test of Varieties.*—Damping off fungous, during June, caused severe loss and, although six varieties were tested, the results obtained were of no experimental value.

Previous results indicate that the best varieties for the district are: Davis Perfect and Improved Long Green for the main crop, and Early Russian for early use. West Indian Gherkin is the best for pickling.

#### WATERMELONS

*Test of Varieties.*—Four varieties of watermelon were tried out, owing to the unfavourable season, no ripe melons were obtained. Results previously obtained indicate that the best variety for the district is Ice Cream.

#### SQUASH

*Test of Varieties.*—Five varieties were tested; Green Hubbard, Golden Hubbard, Delicious, Long White Bush Marrow and English Vegetable Marrow.

The best late variety is without doubt, Golden Hubbard. Three hills of this variety produced seven squash weighing 136 pounds. Green Hubbard is a close second in that the quality is good, but on the other hand it is always a lighter yielding variety. Long White Bush Marrow is the best early variety.

#### CITRON

Citron was tried again this year but owing to the unfavourable weather, early in the season, it did not do well. Usually citron is a sure crop at this Station. Red Seeded is a good variety.

#### MUSK-MELON

*Test of Varieties.*—Nine varieties of musk-melons were tested during the past season. Three hills of each variety were grown in the open garden, and one hill of each in the cold frames. Owing to the heavy rains, experienced during June, practically all of the plants in the open were destroyed by damping off. From the one hill of each variety grown in cold frames a good crop was realized and a fair comparison obtained.

Montreal Market produced 36.5 pounds, with a total number of six melons. The quality was fair.

Milwaukee Market yielded 21.5 pounds, which weight was made up by ten melons. The quality was excellent.

Other smaller melons, Emerald Gem and Paul Rose, produced eleven pounds each. The average weight per melon was about one pound and the quality excellent.

Rocky Ford, Hackensack, Hoodoo, Heart of Gold, and a selection of Milwaukee Market were also under test but showed inferiority in either yield or quality.

## BEANS

Twenty-two varieties of dwarf beans for green picking were tested in thirty-foot rows thirty inches apart, two rows being allotted to each variety. As the season was very favourable for the development of plant disease, the pod spot or anthracnose was quite prevalent. From results obtained so far it is quite evident that disease resistance is the main consideration in garden beans for this district. In the accompanying table the resistance of the various varieties to disease is shown as "percentage of plants not damaged by spot". It is interesting to note therefrom that all of the better yielding varieties this year, were comparatively free from pod spot and varieties such as Davis White Wax and Bountiful Green Bush, that have always been high yielding sorts at this Station, were seriously affected and produced light crops. Details of all varieties tested are shown in the following table:—

BEANS—TEST OF VARIETIES

Variety	Percentage of plants not damaged by spot	Season	Yield of green pods from two 30-foot rows
Refugee 1000-1, O-1469.....	92	Aug. 20-Frost...	lb. 50
Masterpiece, O-1916.....	84	July 30-Aug. 23.	45
Stringless Green Pod, O-1630.....	96	July 24-Aug. 23.	42
Yellow Eye, O-1643.....	82	July 27-Aug. 24.	38
Extra Early Valentine, O-1632.....	78	July 20-Aug. 25.	36
Hodson Long Pod, O-1635.....	98	July 24-Aug. 23.	33
Boston Beauty (Lennoxville).....	38	July 27-Aug. 23.	31
Stringless Green Pod.....	18	Aug. 5-Aug. 23.	25
Fordhook's Favourite.....	30	Aug. 5-Aug. 23.	23
Grenell Rustless, O-1623.....	54	Aug. 27-Aug. 23.	19
Davis White Wax, O-1636.....	26	July 27-Aug. 24.	19
Giant Stringless Green Pod.....	16	Aug. 5-Aug. 28.	18
Challenge Black Wax, O-1915.....	42	July 27-Aug. 23.	16.5
Davis White Wax.....	12	July 30-Aug. 28.	16
Plentiful French, O-1639.....	18	July 27-Aug. 28.	14
Bountiful Green Bush, O-1639.....	22	July 24-Aug. 20.	14
Wardwell Kidney Wax.....	2	July 24-Aug. 23.	12
Fordhook Favourite, O-1641.....	0	July 27-Aug. 9.	12
Round Pod Kidney Wax.....	10	July 24-Aug. 23.	11
Pencil Pod Black Wax, O-1642.....	32	July 24-Aug. 23.	10
Pencil Pod Kidney Wax, O-1638.....	20	July 4-Aug. 23.	10
Kidney Wax.....	0	Aug. 15-Sept. 9.	9

In addition to the dwarf varieties, Kentucky Wonder, Ottawa 1689, a pole variety, was tested. The yield of this variety from two thirty-foot rows was sixty pounds of green pods, and its freedom from pod spot sixty per cent. The first pods were ready for picking on August 15 and from then on until frost killed the vines good pickings were available at intervals of one week. The crop was of excellent quality.

It is doubtful if the increase in yield of this variety over the dwarf sorts would compensate the professional market gardener for the additional expense of staking. For the kitchen garden, however, it is unsurpassed and a few hills will prove a very satisfactory addition and give the greatest return, in string beans, for the use of the land.

#### TOMATOES

*Test of Varieties.*—The past season was decidedly unfavourable in this district, for tomatoes, and, although thirteen varieties and strains were tested in lots of twenty-six plants each, no single variety or strain produced a normal crop of ripe fruit. Alacrity, Bonny Best and an Ottawa selection of Chalk's Jewel gave the best results and produced about half of an average crop. These varieties have usually proved the best at this Station and it has been found that the later varieties are not to be depended upon as frequently they do not ripen.

#### CABBAGE

*Test of Varieties.*—Nineteen varieties of cabbage were grown in the variety tests in 1922. The seed was sown in the hotbed on April 6, the plants pricked off during the second week in May and transplanted to the field on June 6.

The season was favourable for cabbage and all varieties produced larger yields than usual, although, the relative standing of varieties that have been under test for a number of years was approximately the same.

Copenhagen Market is the best early variety that has been tested at this Station. The heads are firm, do not burst easily, and are of excellent size. This year the first heads were ready for use on July 5, and the weight of five average heads, taken at full development, was sixty-five pounds.

Early Jersey Wakefield is the next best early variety, the heads are as firm and usually larger than Copenhagen Market, but are more inclined to burst when nearing full development.

Ex. Amager Danish Ballhead is the best late variety. The heads are of medium size, firm, seldom burst and keep well in storage. This year the first heads were ready for use on August 20, and the entire crop was ready for market on September 18. Five average heads weighed fifty-six pounds.

Marblehead Mammoth has usually proved to be the heaviest yielding late variety. The heads are of excellent size and very firm. It, however, cannot be recommended as a first choice for the Eastern Townships, for often as many as forty per cent of the heads will burst before fully grown. The first heads were ready for use this year on August 10 and the crop reached full development on September 15. Five average heads weighed seventy-six pounds.

*Late Seeding.*—Seed of eight late varieties was sown in the open on June 7, and the plants transplanted during the first week in August. The resulting crop was fully as good as that obtained from the early seeding, although none of the varieties produced marketable heads before the first week in October.

Ex. Amager Danish Ballhead and Marblehead Mammoth again proved to be the best varieties.

A further test of late sowing was conducted with Copenhagen Market and Early Jersey Wakefield, the two best early varieties, with a view to determining just how late these varieties may be seeded to produce a crop. The seed was sown in the open at intervals of about ten days from May 1 until July 2. The last seeding proved too late, although good heads were produced from all seedings up to June 22.



## BRUSSELS SPROUTS

*Test of Varieties.*—Two varieties, Amager Market and Paris Market, were tried, but neither produced a crop. Up to the present this vegetable has not proved successful at this Station.

## SWEET CORN

*Test of Varieties.*—In all thirty-five varieties of sweet corn have been tried out in the variety tests since 1915. During the past season nineteen different varieties and strains were grown. The results gained thus far indicate that Early Malcolm is the best early variety and Golden Bantam the best main crop. Pickaninny, a variety originating at the Central Experimental Farm, Ottawa, is the earliest of all varieties tested, and although the ears are rather small they are of excellent quality. For extra early use it is the best variety tested at this Station.

## CELERY

*Test of Varieties.*—Celery is one of the most popular vegetables in this district and large quantities are sold annually at the Sherbrooke market. During the past season more inquiries were received concerning celery than any other vegetable.

Since 1915 eighteen varieties have been tested at this Station and of these, ten have been grown for at least five years. The varieties that have proven most successful over a period of five years are as follows:—

For home use.—White Plume.

For early market.—Golden Self-blanching.

For main crop and winter storage.—Evan's Triumph and French Success.

## TREE FRUITS

## APPLES

*Variety Orchard.*—The area occupied by this project comprises nine and a fifth acres on which are planted 540 trees. The orchard was started in 1915 and, at that time, was made up of standard commercial varieties as well as seedlings originated mainly by W. T. Macoun, Dominion Horticulturist. During the past seven years it has been found that the climatic conditions which prevail at this Station are too severe for practically all of the hardiest standard varieties, and that apple growing in the immediate district must be confined to hardier sorts than are at present available from nurserymen. Of the seedling varieties many have proven entirely hardy and there are at present in the orchard three hundred and ten trees, representing forty-one seedling varieties that have proven sufficiently hardy to withstand our most severe winters. Among this lot are some of the recent introductions that have already met with general favour throughout Canada, such as Melba, Joyce, Pedro, Lobo and Mendel. All of these bore fruit of excellent quality in 1922.

*Scions and Trees.*—Scions, of the best hardy seedling varieties, are now available for distribution throughout the district, and, a nursery is being started with a view to supplying part of the demand for trees, particularly in districts where standard varieties are not successful.

## PLUMS

*Variety Plum Orchard.*—This project was started in 1915 and comprised a number of the best standard American varieties and a large number of seed-

lings. The result has been similar to that obtained with apples, in that most of the commercial varieties will not withstand our climatic variations, and complete hardiness with this fruit, has been found only among the seedling varieties. Of these Waneta, Omaha, Kahinta and Hawkeye are of reasonably good quality and bear well.

#### PEARS

Several varieties of seedling pear trees were planted in 1915, but so far no fruit has been produced. Usually the trees have been partially winter-killed each year, but all came through the winter of 1921-22 without injury and made exceptional growth during the season. The new wood ripened well and the trees entered the present winter in good condition.

#### CHERRIES

Until the past season the cherry trees, planted in 1915, have done little but produce wood which was usually killed back each winter. Owing, however, to the favourable winter of 1921-22, the trees were in good condition at the beginning of the past season. Four unnamed seedlings produced a good yield of fruit of excellent size and colour and quite pleasant flavour. All trees made strong growth which ripened well.

#### SMALL FRUITS

##### GRAPES

Although the past season was rather late and cool throughout, grapes made a good set and grew steadily during the season. The absence of the usual early



Moore's Early Grapes, ready for picking September 10, 1922.

September frost permitted ripening of early varieties, which produced a splendid crop. Moore Early, McTavish and Delaware all produced well ripened fruit.

Of these, Moore Early was the earliest and by far the best as regards quality and size. The crop from this variety was ready for picking on September 10.

From the results obtained during the past six years, it is evident that the commercial growing of grapes in this district is not likely to be very profitable. There is, however, every indication that, with a little extra care with the vines and in the selection of the varieties, good fruit may be grown for home use on a small scale.

#### STRAWBERRIES

After the dry hot season of 1921, strawberry plants entered the winter in a weak condition with the result that winter-killing was general over the whole plantation. Of the twenty-four varieties under test, not one escaped injury, and, the results obtained at picking time are of no experimental value.

From results obtained over the past six years the best varieties are: Senator Dunlap (per.), Buster (imp.), Valeria (per.), and Portia (imp.).

#### BLACK CURRANTS

*Test of Varieties.*—Of the twelve varieties that have been under test for the past six years the outstanding are: Saunders, Kerry and Climax. Black currants do well in this district and there is a good demand for the fruit.

#### RED CURRANTS

*Test of Varieties.*—An excellent crop of red currants was obtained. Of the five varieties tested Red Grape was the heaviest yielding, producing at the rate of 4,288 pounds per acre. Victoria was the next best variety.

#### WHITE CURRANTS

*Test of Varieties.*—Three varieties were grown, Large White, White Cherry and White Dutch. These varieties have been grown for the past six years and the results over the entire period show that White Cherry is the best variety. In 1922 it produced a yield of 1,682 pounds per acre.

#### GOOSEBERRIES

*Test of Varieties.*—Gooseberries did not do very well, and, although eight varieties were tested, none produced an average crop. From 1916 to 1921 the best varieties have been Houghton, Carrie and Downing.

#### ORNAMENTAL GARDENING

*Annuals.*—This district has proved excellent for the growing of annual flowering and foliage plants. Of the two hundred and ninety-eight varieties, strains and selections tested in 1922 there was not a complete failure and many varieties, of the hardier sorts, carried a strong display of bloom well into October. Most of the annuals tried were seeded in the open during the first week in May. Of these the best results were obtained from the various varieties of Sweet Pea, Nasturtium, Poppy, Clarkia, Malope, Mignonette and Salpiglossis.

Of the various kinds of annuals that do better with a longer growing season than is possible with outdoor planting, and are accordingly started in the hotbed, the following have been found very satisfactory: Aster, Balsam, Salvia, Petunia, Verbena, Phlox Drummondii, Marigold, and Cosmos.

Gladioli and dahlia were fully up to standard, particularly one bed, composed of sixty-seven seedling dahlias, that proved of unusual interest to visitors.

*Dutch Bulbs.*—Contrary to expectations this class of flowering plants did not do so well, during the past season, as usual. Early tulips and narcissi were short and of inferior quality as a whole, and many varieties suffered from winter-killing. Darwin and late flowering tulips were somewhat better, although not fully up to the average.

Bulbs are usually very successful at this Station and add greatly to the appearance of the ornamental grounds during the spring. The varieties that have been found most satisfactory are as follows:—

Narcissi.—Emperor, Golden Spur, Madame de Graaf, Empress and Victoria.

Early tulips.—Artus, Cottage Maid, Prosperine, Joost van Vondel and Duchesse de Parma.

Late tulips.—Isabella and Fulgens.

Darwin tulips.—Clara Butt, La Tulipe Noire, Isis and Zephyr.

*Perennials.*—One hundred and ten varieties of perennial flowering plants are now well established throughout the ornamental grounds. The most outstanding of these are: Pæonies, Delphinium hybridum, Delphinium Chinense, Sweet William, Aquilegia, Pyrethrum, Golden Glow, Gaillardia, Lychnis, Lupins, Oriental Poppy, Perennial Phlox, Garden Pink, Iris and Hollyhocks.

During past seasons, seed has been saved from the most popular sorts and tried out in comparison with commercial seed of the same varieties. The results have shown that as a general rule the home grown seed is best.

*Ornamental Shrubs.*—A large number of shrubs have been tested, and, although many of the most popular are too tender to withstand our severe climatic conditions, there are a large number of excellent varieties that have proven hardy and can be recommended for the district. Of these, good results have been obtained with *Philadelphus grandiflorus*, several varieties of lilac, Bush honeysuckle, *Hydrangea paniculata grandiflora*, Japanese quince, Barberry, Dog-wood and Flowering crab.

## CEREALS

### VARIETY TESTS OF GRAIN

The season throughout was favourable for grain crops although the very heavy rainfall during June was responsible for some damage on low-lying areas. The area occupied by the variety tests of grain was, however, high and well drained, and, as a consequence, the crop was benefited rather than retarded by the unusual precipitation. Harvest was a few days later than usual, but the weather was fine and all varieties were cut while at their best.

The land used for the experiments with grain was a rather sandy loam, underlaid with gravel. The preceding crop was grain. Soon after harvest the area was ploughed and, during the winter months, a dressing of barnyard manure, amounting to twelve tons per acre, was applied. This was thoroughly incorporated with the soil, and the land worked up into a good condition for seeding, by discing and drag-harrowing, during the last week in April.

Each variety occupied a long narrow strip, one-quarter acre in area. Before sowing the seed was immersed for ten minutes in a formalin solution made up of two ounces of formalin to five gallons of water. This proved quite effective as very little smut appeared throughout the season. All varieties were sown on May 1st, germination was good, no disease was unduly prevalent and seasonal conditions for crop development quite favourable.

Following are the results obtained:—

## OATS—TEST OF VARIETIES

Variety	Date of ripening	Number of days maturing	Height	Strength of straw on a scale of 10 points	Yield per acre	Weight per measured bushel
			Inches		Lbs.	Lbs.
Banner Ottawa 49.....	Aug. 4	96	46	9.0	2,070	33.8
Gold Rain.....	Aug. 3	95	47	8.5	1,985	36.5
Alaska.....	July 26	87	33	10.0	1,750	37.8
Liberty Ottawa 480.....	Aug. 2	94	41	9.5	1,060	46.8

## BARLEY—TEST OF VARIETIES

Variety	Date of ripening	Number of days maturing	Height	Strength of straw on a scale of 10 points	Yield per acre	Weight per measured bushel
			Inches		Lbs.	Lbs.
O.A.C. 21.....	July 24	85	33	9.1	2,905	47.5
Chinese Ottawa 60.....	July 25	86	34	8.5	2,515	49.2
Himalaya Ottawa 59 (Hulless).....	July 19	79	19	6.0	1,910	60.2

## WHEAT—TEST OF VARIETIES

Variety	Date of ripening	Number of days maturing	Height	Strength of straw on a scale of 10 points	Yield per acre	Weight per measured bushel
			Inches		Lbs.	Lbs.
Huron Ottawa 3.....	Aug. 9	100	41	10	1,872	60.0
Marquis Ottawa 15.....	Aug. 8	99	32	10	1,470	61.0
Ruby Ottawa 623.....	Aug. 3	94	27	10	828	57.0

## FIELD BEANS

*Breeding Work.*—With a view to improving the Yellow Eye and Soldier varieties of beans, twenty-one different lots of seed, originating from selections made in 1920, were planted and observed during the past season. A number of these selections have apparently been the result of natural crossing and show new and distinct varietal characters, while others are easily recognized as variations within the original variety. This work will be carried on for several years as there are indications that improved strains, characterized by increased productiveness, earlier maturity, and greater resistance to disease, may be obtained.

## FORAGE CROPS

## ENSILAGE CORN

## VARIETY TESTS

Owing to heavy rains and low average temperature experienced during June and the first part of July, the corn crop was very backward until mid-season. The later part of the season, however, was more favourable, and this, together with the high state of fertility of the soil, was largely responsible for the fairly large yields obtained.

The land on which the experiment was conducted was fall ploughed grain stubble and received an application of twenty tons of barnyard manure per acre during the winter months. This was thoroughly incorporated with the soil the first week in May, by discing and harrowing, and an application of three hundred and fifty pounds per acre of commercial fertilizer, containing two per cent nitrogen, six per cent phosphoric acid and nine per cent potash, was spread broadcast and mixed with the soil by a light harrowing.

Fifteen varieties were tested in duplicate plots of one-hundredth acre each, and the ranges checked at every fifth plot with a plot of Compton's Early. The crop was grown in hills, three feet apart each way, with four stalks to the hill. The area received horse cultivation at intervals of about ten days, from the time when the crop was about two inches high until the first of August, when it became too tall to permit of further cultivation. It was hand-hoed once during the last part of June. The seed was planted on the 15th of May and the crop harvested the 10th of September. The results are shown in the following table:—

ENSILAGE CORN—TEST OF VARIETIES

Variety	Maturity	Height		Yield per acre First plot		Yield per acre Second plot		Yield per acre Average	
		Ft.	In.	Tons.	Lb.	Tons.	Lb.	Tons.	Lb.
Golden Glow	Early dough	10	4	21	900	20	1,800	21	350
Wisconsin No. 7	Late milk	8	4	19	300	20	1,800	20	750
Compton's Early	Early dough	8	6	18	1,100	20	400	19	750
Improved Leaming	Late milk	9		18	1,900	19	1,500	19	700
Northwestern Dent (Macdonald College)	Late dough	8	3	19	300	18	1,300	18	1,800
Disco Pride Yellow Flint	Late milk	8	5	18	1,100	16	1,900	17	1,500
Disco Pride Yellow Dent	Late milk	8		17	1,100	16	1,000	17	50
Salzer's North Dakota	Early dough	8		17	200	16	400	16	1,300
90 Days White Dent	Early milk	9		16	1,100	16	700	16	900
Wisconsin No. 1	Late milk	8	6	15	1,500	16	900	16	200
Leaming	Late milk	8	6	16	400	15	1,700	16	50
White Cap Yellow Dent	Late milk	7		14	600	16	300	15	450
Bailey	Late milk	9		14	1,700	15	300	15	
Longfellow	Late milk	7	9	15	300	13	1,400	14	850
Northwestern Dent	Late dough	7	6	12	500	12	500	12	500
Average				17	200	17	126	17	163

Although the results obtained in 1922 are not in close accord with those of past seasons, it is worthy of note that Golden Glow and Compton's Early reached the dough stage and produced very desirable yields. The Macdonald College strain of Northwestern Dent made a very creditable showing, as it was the only good yielding variety to reach the late dough stage. It is also a good, uniform strain and produces a liberal yield of cobs. Altogether, it would seem a very desirable variety for this district.

## SUNFLOWERS

## VARIETY TEST

Owing to the fact that sunflowers may be depended upon to produce a crop under a greater variation of soil conditions and at lower temperatures than corn, its use as an ensilage crop has become quite general throughout the Eastern Townships. For the purpose of obtaining information on the value of different varieties and regional strains, nine separate lots were tested on a piece of land adjoining, and similar to, the area on which the variety tests of corn were conducted.

The seed was sown in plots one-fiftieth acre in area on May 16. A good stand was obtained and the plants were thinned to eight inches apart in the row on June 4. The season proved very favourable for the growth of the crop and yields were unusually large. The crop was harvested September 16, and the results obtained are as follows:—

SUNFLOWERS FOR ENSILAGE—TEST OF VARIETIES

Variety	Source	Maturity. Per cent full bloom	Height		Yield per acre	
			Ft.	In.	Tons	Lb.
Mammoth Russian.....	Clarke & Stewart.	55	10		37	500
Mammoth Russian.....	Rosthern.....	80	7	8	32	1,800
Mammoth Russian.....	Kenneth McDon- ald.....	45	12	2	30	1,100
Mammoth Russian.....	Rosthern.....	60	7	9	23	
Mammoth Russian.....	Dakota.....	60	10		22	1,800
Early Ottawa.....	Ottawa.....	65	9	9	21	1,000
Early Ottawa No. 76.....	Ottawa.....	40 ripe	7	3	18	1,100
Mammoth Russian.....	Rosthern.....	45	6	8	17	800
Mixed Mammoth Russian.....	Rosthern.....	50	6	2	15	1,200
					24	811

*Breeding work with Sunflowers.*—In order eventually to obtain a variety or strain of sunflower of greater uniformity and value for the district, a number of plants, possessing desirable characteristics, were isolated and self-fertilized. The seed thus produced was saved separately and will be used for the starting of breeding work next season.

## FIELD ROOTS

The area on which the variety tests of mangels, swede turnips, field carrots and sugar beets were conducted had been in garden the previous season. It was fall ploughed and eighteen tons per acre of barnyard manure applied throughout the winter. During the first week in May the land was ploughed again and harrowed. An application of commercial fertilizer, of the same analysis as that used on the ensilage corn experiments, was spread broadcast at the rate of four hundred and fifty pounds per acre. This was not harrowed in, but was sufficiently incorporated with the soil when the land was run up with shallow drills, twenty-eight inches apart, for planting.

During the season the entire area was cultivated five times and hand-hoed twice. In addition to a comparison of yields, a determination of the purity of the various varieties was arrived at, the results of which are shown under their respective headings as per cent true to type. It is regrettable to note that many of the so-called varieties, obtainable commercially, are largely composed of roots foreign to the variety. With this pronounced lack of uniformity, it is impossible

to forecast the yielding ability of many of the most popular commercial varieties. It was also found that the types varying from the standard of the variety were nearly always composed of inferior sorts. This not only tends to depress the yield of the variety, but lowers the quality of the crop as a whole.

## MANGELS

The seed was sown on May 4 and the plants thinned to eight inches apart on the 25th and 26th of the same month. The season was quite favourable for the development of the crop and good yields were obtained. The roots were harvested on the 3rd and 4th of October. The yield and purity of the different varieties is shown in the accompanying table:—

MANGELS—TEST OF VARIETIES

Variety	Per cent true to type	Yield per acre. First plot		Yield per acre. Second plot		Yield per acre. Average	
		Tons	Lbs.	Tons	Lbs.	Tons	Lbs.
Half Sugar Mangel.....	67	44	1,300	46	1,600	45	1,450
Yellow Intermediate.....	84	33	1,200	38	1,100	36	150
Giant White Half Long.....	42	31	1,100	37	1,800	34	1,400
Golden Tankard.....	51	29	1,300	35		32	650
Best of All.....	57	30	900	33	700	31	1,800
Long Red Mammoth.....	41	31	1,300	30	400	30	1,850
Prize Mammoth Long Red.....	31	35	1,300	25	800	30	1,050
Red Globe.....	53	26	1,300	28	300	27	800
Perfection Mammoth Long Red.....	28	25	200	26	400	25	1,300
Select Mammoth Long Red.....	49	26	1,800	26	900	26	1,350
Red Globe.....	67	11	300	15	100	13	200
		29	1,445	31	372	30	909

## SWEDE TURNIPS

Seeding was done on May 12, at which date the weather and soil conditions were ideal, but the eleven days of dry hot weather which followed, were responsible for a very slow germination, consequently the plants were not ready for thinning until the second week in June.

On June 17, while the plants were in a weakened condition from thinning, a very heavy rain and hail storm caused a further set-back to the crop, from which it did not recover until well into July.

During the latter part of the season conditions for growth were more favourable, but the period was too short for successful crop development and rather light yields were realized. The crop was harvested on October 23.

The following table gives the yield per acre and the per cent true to type:—

SWEDE TURNIPS—TEST OF VARIETIES

Variety	Per cent true to type	Yield per acre. First plot		Yield per acre. Second plot		Yield per acre. average		Average yield per acre of tops	
		Tons	Lbs.	Tons	Lbs.	Tons	Lbs.	Tons	Lbs.
New Century.....	93	30	100	29	800	29	1,450	6	150
Ditmar's.....	94	24	1,800	21	400	23	100	5	850
Hartley's Bronze Top.....	73	21	1,400	19	800	20	1,100	4	1,300
Kangaroo.....	57	18	1,400	22	200	20	800	6	1,350
Mammoth Clyde.....	63	20	800	19	1,800	20	300	8	1,250
Perfection.....	69	19	100	19	1,600	19	850	4	400
Hall's Westbury.....	64	19	1,750	18	550	19	150	6	1,450
Good Luck.....	58	19	200	18	1,900	19	50	7	200
Bangholm.....	88	18	700	19	850	18	1,775	6	500
Halewood's Green Top.....	51	18	900	17	1,750	18	325	5	350
Monarch.....	55	20	750	15	1,200	17	1,975	4	1,200
Average.....		20	1,090	20	350	20	1,170	5	1,909



## FIELD CARROTS

The seed was sown on May 4 and the plants thinned to a distance of two inches apart, during the first week in June. The season was very favourable for the development of this crop and the yields obtained were unusually large for the district. The crop was harvested on October 3, with the following results:—

FIELD CARROTS—TEST OF VARIETIES

Variety	Per cent true to type	Yield per acre. First plot		Yield per acre. Second plot		Yield per acre. Average	
		Tons	Lbs.	Tons	Lbs.	Tons	Lbs.
Improved White Intermediate.....	93	22	1,100	25	300	23	1,700
Giant White Belgian.....	92	25	1,800	20	400	23	100
New Yellow Intermediate.....	87	20	600	21	600	20	1,600
Danish Champion.....	96	21		20	200	20	1,100
Danver's Half Long Stump.....	73	16	1,600	18	100	17	850
Average.....		21	620	20	1,920	21	270

## SUGAR BEETS

The work with this crop consisted of testing four regional strains or seed from four different sources for yielding ability. The seed was sown on May 3, the plants thinned to six inches apart on May 25, and the crop was harvested October 3. The season was quite favourable for this crop and good yields were obtained. The following table gives the results of the experiment:—

SUGAR BEETS—TEST OF VARIETIES

Source of Seed	Per cent sugar in juice	Yield per acre	
		Tons	Lbs.
Denmark.....	14.52	19	500
Chatham, Ont.....	15.24	18	
Waterloo, Ont.....	15.44	17	800
British Columbia.....	15.30	17	600
Average.....		17	1,975

## BREEDING WORK WITH FIELD ROOTS

With a view of obtaining strains or varieties of both mangels and swede turnips of greater value for the Eastern Townships than those that are now obtainable commercially, a number of roots of the Long Red variety of mangels and Bangholm swede turnips were selected. All of these are of excellent type and uniform as to outward characters. To obtain as high a standard of feeding value as possible, all roots below a fixed standard of specific gravity, as determined by weight in proportion to volume, were rejected. It is hoped that by following such a course through several generations, varieties of fixed type and superior agricultural value will be obtained.

## GRASSES AND CLOVERS

### THE PERSISTENCE OF AGRICULTURAL GRASSES

In order to test the persistence of the most common agricultural grasses when sown with a standard mixture for hay, five mixtures containing respectively red top, timothy, meadow fescue, tall oat and orchard grass, were seeded along with the regular farm oat crop in 1921, in half-acre blocks.

The standard mixture was composed of eight pounds red clover, two pounds alsike, one pound White Dutch and four pounds timothy per acre.

The resulting crop in 1922 showed but little difference in the stand and quantity on any of the plots, although tall oat and red top showed the greatest persistence and formed a good percentage of the crop. Tall oat also produced an excellent aftermath.

### NEW EXPERIMENTS

The following new experiments were laid out and started during the past season and will be reported on in the 1923 report:—

1. Broadcast vs. seeding in rows for red clover seed production.
2. Variety test of red clover.
3. The extent to which alsike may replace red clover in the standard mixture for hay.
4. Test of sweet clovers.
5. Variety test of timothy.

With each experiment the work is duplicated, in some form, and the entire area comprises eighty-seven plots. On every plot a good stand was obtained and all crops entered the winter in excellent condition.

## POULTRY HUSBANDRY

The weather conditions during the year 1922 were very suitable for poultry work in general; a short spell of wet weather in the early spring made the brooding of chickens more difficult, but that was balanced by a splendid summer and autumn for the proper development of the growing stock. In order to provide some form of shade for the growing stock during the hot weather, a strip of land in each yard of the range was ploughed and planted to sunflowers; these plants grew to a height of twelve to fourteen feet before being cut for silage purposes; the shade provided was ideal for the roaming birds which developed in splendid shape.

An additional colony house 10 by 12 feet in size was built in March to provide more housing space to brood young chicks, and later used for the growing stock on free range. Two straw loft laying houses, each 16 by 32 feet in size, are used to house each year two hundred pullets for trapnest selection, and to secure data on different feeds, costs of feeding, producing, etc. These straw loft houses are meeting with approval on many farms in the district, and are giving splendid satisfaction as a dry well-ventilated house for the cold winter weather of the province.

### STOCK

Only Barred Plymouth Rocks are kept on this Station. There were on hand at the beginning of the year 1922, one hundred and ninety-nine pullets, eighty-two yearling hens, eight two-year-old hens and fifteen cockerels. The original stock was secured by purchasing eggs in the spring of 1919 from purebred Barred Plymouth Rock flocks, but it was impossible to get the eggs from flocks where

trapnesting or pedigree work had been carried on, so the only alternative was to endeavour to raise up a bred-to-lay strain by careful trapnest selection and the use of males for breeding from dams of known high production. All the females are trapnested as long as they are kept on the Farm, and only those giving a profitable record are kept after their first year. The average production per bird for the first year was 121 eggs, those females were used for breeding, mated to sons of hens with records of over 200 eggs, and the progeny gave an average production per bird of 170.5 eggs in 1920-21, two pullets of that year making the respective records of 290 and 301 eggs. Another year's work along the same lines of breeding brought the average production per bird to 178 eggs in 1921-22, with thirty birds making records over 200 eggs, four of these going over 250 eggs each. A number of the best birds kept as breeders in 1921, with records over 200 eggs each were mated to sons of "Lennoxville Dandy," whose record is 290 eggs. The eggs used for hatching from those pens gave an average fertility of 84.5 per cent with a hatchability of 54 per cent of the fertile eggs. Almost all the chicks reared on the Farm in 1922 were from these pens. The remainder of the yearling hens and a number of the best pullets were mated to cockerels from hens of high production, and the eggs used for hatching to supply the demand for day-old chicks. The eggs were all hatched artificially in a 2,440-egg machine operated in the basement of the Administration Building. Altogether 2,350 chicks were hatched in the spring of 1922, 1,000 being kept for the Farm, and 1,350 were sold as day-old chicks in lots of fifty or less to an order. Pedigree baskets were used to separate the eggs of individual hens and practically all chicks kept on the Farm were pedigree banded. The chicks were all artificially brooded, colony houses being used, equipped with coal-burning brooder stoves, which proved most satisfactory for brooding chicks in large numbers.

An account is kept of the feed used each month during the summer in order to get information as to the cost of rearing birds for the laying pens. These prices are charged according to actual prevailing feed prices in the vicinity. Below is given the feed costs for the past four years:—

FEED COSTS OF GROWING CHICKS

Year	April	May	June	July	August	Sept.	Oct.	Total feed cost per chick
								cents
1919.....		3½	6½	14½	18½	20½	23½	0.87
1920.....	0.02½	0.06½	0.07	13½	17½	20½	27½	0.94½
1921.....	0.01½	0.05½	0.07½	12½	15½	15	16½	0.74½
1922.....	0.01½	0.03½	0.05½	09½	09½	10½	11	0.51½

NOTE:—A number of pullets were laying in October in 1921 and also in 1922. Approximate average cost of feed to raise a pullet to laying age, according to past four years' prices, would be seventy-seven cents per bird.

## METHODS OF FEEDING THE YOUNG STOCK

The chicks were allowed no food until about sixty hours after hatching, they were then given small feeds of dried bread, which was put through a grinder and then very slightly moistened with water or milk, this was gradually substituted by a mash composed of bran, middlings, cornmeal and a small percentage of fine beefscrap after two or three days of feeding. Some good prepared chick feed of finely cracked grains is also used as alternate feeds after the second or third day of feeding, this chick feed is scattered in a litter of

cut straw to encourage exercise. Fresh water is kept before them, and sour milk is gradually introduced after the fifth day. A small percentage of hard-boiled infertile eggs may be used after the third or fourth day also. Great care must be exercised in providing proper temperature and food during the first two weeks. Musty or mouldy food or litter must not be used if success is expected. As soon as the stock get free range self-feeding hoppers are used, supplied with a home-mixed ration of equal parts wheat and cracked corn in one compartment, and a dry mash of bran, middlings, cornmeal and ground beefscraps in another compartment. If more hasty growth was desired, a wet mash made of the same mixture as fed in the hoppers was moistened with sour skim milk and fed at noon.

### DISPOSAL OF THE STOCK

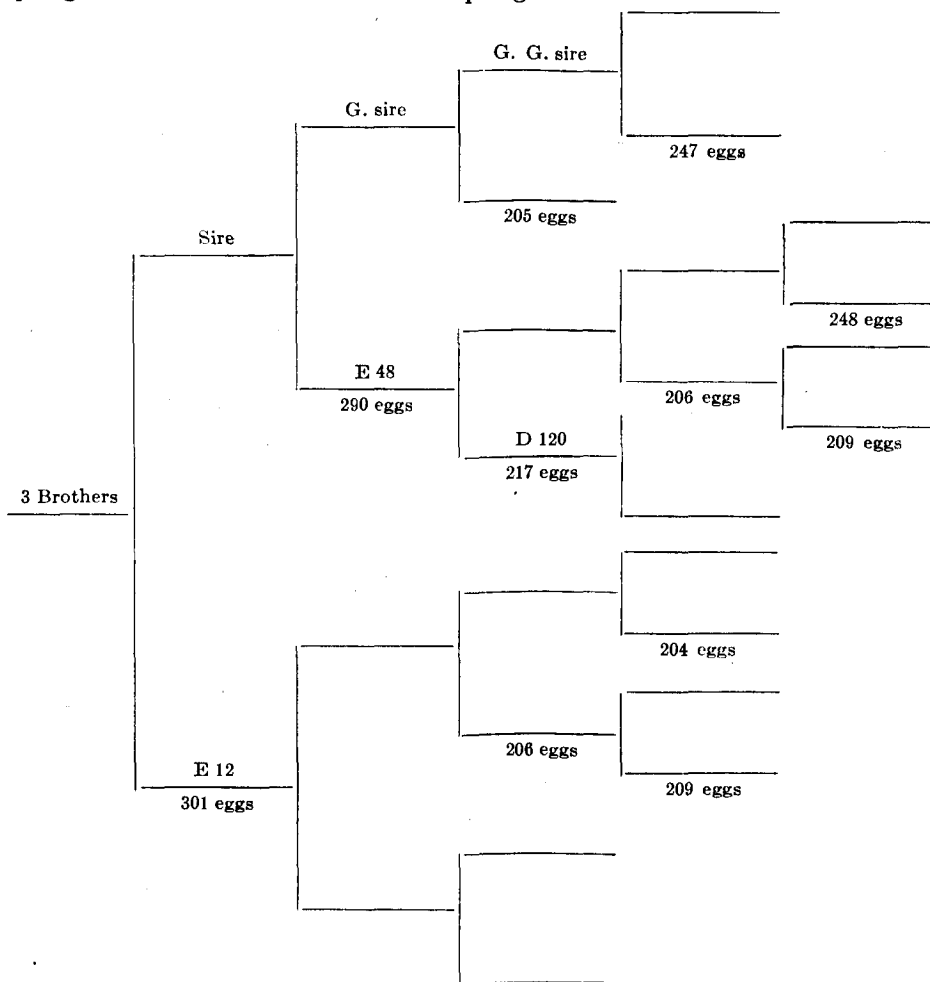
In order to allow more space for the growing stock, in July one hundred and twenty cockerels which were not pedigreed, or were from hens with the lowest records were disposed of as broilers. In October two hundred pullets were selected for the winter-laying houses, ninety-three pullets were sent to the Experimental Farm at La Ferme, Que., and about seventy-five more were sold in small lots locally for laying purposes. A number of cockerels for breeding were sent to the Experimental Farms at Charlottetown, P.E.I., Fredericton, N.B., Cap Rouge, Que., La Ferme, Que., and Kapuskasing, Ont., over fifty cockerels were sold to farmers in the province for breeding purposes, fifteen were retained for use in the breeding pens on the Farm next spring, and the remainder were used for crate feeding for market purposes. Following is shown the gain and amount of feed required for an experiment on twenty-four birds weighed into the crates in September, to find what gain could be made in three weeks and cost of same.

#### FATTENING EXPERIMENT, 1922

Date entered crates	No. of birds	Weight at start	Weight after three weeks	Total cost of feed	Cost per bird	Cost per pound gain	Total gain in three weeks
		lb.	lb.		cts.	cts.	lb.
Sept. 15.....	24	84	125.5	\$5.21	21.7	12.5	41.5

Feed used to feed 24 birds in fattening crates for three weeks, =	
90 pounds cornmeal at 1½ cents per pound.....	\$ 1.35
45 pounds middlings at 1½ cents per pound.....	0.78
45 pounds shumacher at 1½ cents per pound.....	0.78
30 pounds beefscraps at 6 cents per pound.....	1.80
200 pounds skim-milk at ¼ cent per pound.....	0.50
	<hr/>
	\$5.21

About twenty-five of the one hundred and ninety-nine pullets on hand at the beginning of 1921, had to be culled out as not having made a favourable winter record by March 1. Another selection was made in September retaining enough of the best to bring the stock of adult females for breeding purposes up to one hundred birds. Seventy-three of the one hundred adult females on hand have records of over 200 eggs in a year. The adult breeding females are not fed for heavy egg production during the winter months, but just to keep them in good healthy condition for producing eggs that will hatch strong healthy chicks. We have been fortunate in rearing some cockerels from Lennoxville Champion E 12 (301 eggs), and it is intended to use three of them in pens A, B, and C in the spring of 1923. Below is shown their pedigree:—



Some of the birds to be used in pens A, B, C and D and their winter record as well as their pullet year record:—

## PEN A

Hen No.	Winter record	Year record
E8.....	105	264
E22.....	92	252
E25.....	96	245
E48.....	94	290
E78.....	85	238
E90.....	79	233
F1.....	80	230
F19.....	87	239
F21.....	80	232
F102.....	82	239
F116.....	88	258
F117.....	77	239
F126.....	79	259
F162.....	81	250

Mated to a son of E12, whose record is 301 eggs.

## PEN B

Hen No.	Winter record	Year record
E1.....	97	222
E15.....	61	225
E20.....	78	226
E121.....	77	224
E150.....	65	228
E181.....	75	224
D50.....	60	226
F122.....	74	229
F141.....	62	221
F144.....	64	222
F80.....	70	219
F60.....	85	217
E97.....	88	217
E102.....	75	219

Mated to a son of E12, whose record is 301 eggs.

## PEN C

Hen No.	Winter record	Year record
E25.....	69	218
F190.....	71	217
F11.....	86	214
F18.....	83	214
E9.....	88	214
E31.....	72	213
E10.....	66	212
F7.....	76	209
F135.....	70	209
F196.....	60	209
E39.....	84	208
E184.....	74	207
E38.....	51	207
D170.....	57	207
E55.....	81	206

Mated to a son of E12, whose record is 301 eggs.

## PEN D

Hen No.	Winter record*	Year record
E12.....	92	301
E156.....	67	205
F130.....	54	205
E23.....	49	204
E44.....	52	204
E163.....	63	204
F143.....	51	203
F186.....	60	203
F146.....	80	202
E65.....	58	202
E70.....	88	202
E53.....	66	201
E4.....	69	201
E19.....	68	201
E68.....	50	201

\* Mated to a son of E48, whose record is 290 eggs.

## FEEDING THE LAYING PULLETS

In order to secure more information as to the cost of feeding laying pullets during the different months of the year, the two hundred pullets which are housed each year in the straw-loft laying houses are used not only for trapnest selection, but an account is kept of all feed consumed by them during each month of the year. All feed is charged at the price which is being paid in the locality, and the eggs are valued at the prices which are prevailing at the time. The pullets are fed on a home mixed scratch grain consisting of one part cracked corn, one part wheat and one-half part good plump oats, this scratch grain is scattered in a deep litter of straw morning and evening, a heavier feed being given in the evening than in the morning. This grain ration was used in 1920 with two parts cracked corn instead of one part with very good results but greater care had to be exercised to prevent over fat conditions. A dry mash consisting of 100 pounds bran, 100 pounds middlings, 100 pounds cornmeal, and twelve pounds ground beefscraps to every 100 pounds of the meal mixture, is fed in an open hopper. Grit, shell and fresh water are available at all times. Green food is supplied either by mangels, sugar beets or clover leaves. The average number of pullets in the pens during each month is the dividing factor for average cost per bird, eggs per bird, profits, etc. The following table will give the results during the laying year November 1, 1921, to November 1, 1922, and is followed by the average eggs, profit and cost per bird, as well as the average cost per dozen eggs during the past three years.

NOTE.—Only feed is considered in costs per bird.

FEED COSTS AND REVENUE FROM PULLETS  
1921 and 1922

Month	Number of pullets	Cost of feed \$ cts.	Eggs laid	Price sold Cts.	Total value \$ cts.	Profit over feed \$ cts.	Eggs per bird	Profit per bird Cts.	Cost per bird Cts.	Cost per dozen eggs Cts.	Per cent production per day
1921											
Nov.....	200	31 00	1,946	0-65	105 40	74 40	9-73	37-20	15-50	19-19	32-43
Dec.....	199	31 30	3,106	0-765	198 00	166 70	13-60	83-77	15-72	12-05	50-32
1922											
Jan.....	196	32 79	3,016	0-552	138 70	105 91	15-38	54-03	16-22	13-00	49-61
Feb.....	194	26 33	2,479	0-50	103 14	76 71	12-77	39-54	13-57	12-10	45-60
Mar.....	163	24 46	2,788	0-45	104 55	80 09	17-08	49-13	15-00	10-50	55-09
Apr.....	180	24 42	2,803	0-30	70 07	45 65	17-44	28-53	15-25	10-46	58-13
May.....	158	19 24	3,062	0-30	76 55	57 31	19-38	36-27	12-17	7-54	62-51
June.....	153	18 40	2,353	0-30	58 82	40 42	16-09	26-41	12-02	9-38	53-43
July.....	152	21 20	2,104	0-30	52 60	31 40	13-84	20-65	13-94	12-10	44-64
Aug.....	98	19 20	1,627	0-34	46 10	26 23	16-60	27-45	19-59	14-15	53-54
Sept.....	98	16 00	1,357	0-40	45 23	29 90	13-84	29-82	16-32	14-14	46-13
Oct.....	55	9 85	538	0-45	20 17	10 32	9-78	18-78	17-90	22-00	31-54
Total.....	152 average birds	\$274 19	27,179	0-44	1,019 33	745 24	178 average each	\$4 51	\$1 83	13 cts. average	48-58 average



—  
 AVERAGES FOR THREE YEARS IN COSTS, PROFITS, ETC.

	1919-1920				1920-1921				1921-1922			
	Eggs per bird	Profit per bird	Cost per bird	Cost per dozen eggs	Eggs per bird	Profit per bird	Cost per bird	Cost per dozen eggs	Eggs per bird	Profit per bird	Cost per bird	Cost per dozen eggs
		Cts. Loss	Cts.	\$ cts.		Cts. Loss	Cts.	\$ cts.		Cts.	Cts.	Cts.
Nov.....	1-50	(10-75)	21-50	1 84	2-75	(8-50)	28-00	1 22	9-75	37-25	15-50	19-25
Dec.....	10-50	47-75	30-25	0 33	14-75	83-25	27-75	0 22	15-75	83-75	15-75	12-25
Jan.....	12-75	55-25	30-50	0 29	18-50	91-25	24-50	0 16	15-50	54-00	16-25	13-00
Feb.....	10-50	33-50	31-25	0 37	17-50	79-75	22-75	0 15	12-75	39-50	13-50	12-25
March.....	11-75	50-25	24-25	0 25	19-50	75-00	19-25	0 12	17-25	49-25	15-00	10-50
April.....	14-75	45-75	27-75	0 23	18-75	41-50	19-25	0 12	17-50	28-50	15-25	10-50
May.....	12-75	40-75	19-75	0 18	18-25	34-25	19-25	0 12	19-50	36-25	12-25	7-50
June.....	11-50	35-75	21-75	0 22	15-75	34-25	19-00	0 14	16-25	26-50	12-25	9-50
July.....	10-75	35-25	19-25	0 22	11-50	21-00	17-25	0 18	13-75	20-75	13-75	12-00
Aug.....	10-25	26-75	28-75	0 33	11-00	23-75	17-50	0 19	16-75	27-50	19-50	14-25
Sept.....	8-75	19-00	24-00	0 37	8-75	14-25	18-00	0 25	13-75	29-75	16-25	14-25
Oct.....	5-25	3-50	25-75	0 58	13-50	41-75	18-25	0 16	9-75	18-75	17-75	22-00
	121	\$3 83	\$3 04	0 435	170-5	\$5 32	\$2 50	0 25	178-2	\$4 51	\$1 83	0-13
				average cost per dozen				average cost				average cost

Although yearling and two-year-old hens are kept principally for their value as breeding stock, yet a record is kept of the costs of feed, eggs laid, and cost of producing, so as to have some determination as to the most profitable age for egg production. Owing to older birds taking on fat more readily, a grain ration of one part cracked corn, three parts wheat and one part good oats is used as a scratch grain, and the dry mash is also of a lighter nature. The eggs are figured at market value instead of their value as eggs for hatching, in the table to follow. It will be noticed that the average cost for feed to produce one dozen eggs from pullets was 13 cents when an average per cent production of 48.5 was received and that the cost for feed to produce one dozen eggs from yearling hens was 28.5 cents, when an average per cent production of 31.75 was received, while the costs for feed to produce one dozen eggs from two-year-old hens was 82 cents per dozen when an average production of 29.75 was received. If only the four winter months were taken, for comparison, the results would be still more outstanding, viz; that between November 1 to March 1, the average cost for feed to produce one dozen eggs from pullets was 14.5 cents when an average per cent production of 44.5 was received, that the cost for feed to produce one dozen eggs from yearling hens 56.5 cents when an average per cent production of 12.5 was received, while the cost for feed to produce one dozen eggs from two-year-old hens was \$2.10 when an average production of 4.5 was received. The following tables show detail costs of feeding, production and profits from both yearlings and two-year-olds:—

COSTS, YIELDS AND REVENUE FROM YEARLING HENS  
1921 and 1922

Month	Number of birds	Cost of feed	Eggs laid	Price sold	Total value	Profit over feed	Loss over feed	Eggs per bird	Profit per bird	Cost per bird	Cost per dozen eggs	Per cent production per day
		\$ cts.		Cts.	\$ cts.	\$ cts.	\$ cts.		Cts.	Cts.	Cts.	
1921												
Nov.	82	11 69	415	65	22 50	10 81	5 06	5 06	13 18	14 26	33 88	16 86
Dec.	82	13 68	285	76	18 17	4 49	3 47	3 47	5 47	16 68	57 00	11 19
1922												
Jan.	82	12 55	211	55	9 69		2 86	2 57	Loss (3 48)	15 31	78 43	8 55
Feb.	82	14 08	299	50	12 50		1 58	3 65	Loss (1 92)	17 20	56 32	13 04
Mar.	82	16 81	1,117	45	41 89	25 08		13 62	30 59	20 50	18 08	44 00
April.	81	12 30	1,487	30	37 43	25 13		18 48	31 02	15 00	10 00	61 60
May.	56	9 38	1,866	30	21 65	12 27		15 46	21 91	16 75	13 02	49 87
June.	52	6 90	595	30	14 88	7 98		12 93	15 34	13 27	13 90	43 10
July.	46	7 10	528	30	13 20	6 10		11 45	13 26	15 43	16 13	36 93
Aug.	41	6 23	557	34	15 78	9 55		13 58	23 29	15 19	11 53	33 12
Sept.	41	5 74	470	40	15 66	9 92		11 46	24 19	14 00	14 70	38 20
Oct.	39	5 22	298	45	11 17	5 95		7 64	15 25	13 38	20 75	24 64
	63	\$121 68	7,138	44	\$244 52	\$118 28	\$4 44	119 37	16 12	\$1 87	28 64	31 75
	Average number of birds	Cost of feed	Eggs laid	Average price sold	Total value	Profit over feed	Loss over feed	Eggs per bird	Average profit per bird	Cost per bird	Average cost per dozen	Average per cent production per day

COSTS, YIELDS AND REVENUE FROM TWO-YEAR OLD HENS  
1921 and 1922

Month	Number of hens	Cost of feed \$ cts.	Eggs laid	Price sold Cts.	Total value \$ cts.	Profit over feed \$ cts.	Loss over feed \$ cts.	Eggs per bird	Profit per bird Cts.	Cost per bird Cts.	Loss per bird Cts.	Cost per dozen eggs \$ cts.	Average per cent production
1921													
Nov.....	8	1 14	10	65	0 54	.....	0 60	1-25	.....	14 26	7-77	1 38	4-16
Dec.....	8	1 32	4	76	0 25	.....	1 07	0-50	.....	16 60	13-37	3 96	1-61
1922													
Jan.....	8	1 23	22	55	1 00	.....	0 23	2-45	.....	15 31	3-00	1 21	7-90
Feb.....	8	1 40	9	50	0 37	.....	1 03	1-12	.....	17 30	13-00	1 86	4-00
Mar.....	8	1 64	92	45	3 45	1 81	.....	11-50	22 62	20 50	.....	0 21	37-09
April.....	8	1 20	113	30	2 83	1 63	.....	14-12	20 36	15 00	.....	0 13	47-06
May.....	7	1 17	114	30	2 85	1 68	.....	16-71	24 00	16 71	.....	0 12	53-90
June.....	6	1 00	87	30	2 17	1 17	.....	14-50	19 50	16 66	.....	0 14	46-33
July.....	6	0 93	93	30	2 33	1 40	.....	15-50	23 33	15 50	.....	0 11	50-00
Aug.....	6	0 87	101	34	2 86	1 99	.....	16-83	33 16	14 50	.....	0 10	54-29
Sept.....	6	0 84	73	40	2 43	1 59	.....	12-16	26 50	14 00	.....	0 14	40-53
Oct.....	6	0 78	19	45	0 70	.....	0 08	3-13	.....	13 00	1-33	0 48	10-00
		\$13 52	737	Average price sold 44	\$21 78	\$11 27	\$3 01	109	\$1 31	\$1 89	38-50	Average cost per dozen 0-82	29-75
						3 01							
						\$8 26							

## EARLY versus LATE HATCHED PULLETS

This test has been carried on during the past three years at this Station, as a means of trying to demonstrate the impossibility of expecting late hatched pullets to make the most profitable winter producers. Some have the idea that late hatched birds will give a heavier production during January and February and counterbalance the start which the early hatched had made in November and December, but the results of the past three years have shown that such is not the case. A very clear case was shown that early hatched pullets will mature faster than later hatched, when pullets hatched in April, 1921, laid at 150 days of age, while pullets hatched in May of the same year did not commence until 173 days of age. The late hatched pullets cannot mature their bodies and produce eggs when enough food cannot be taken in daylight to carry them through the long winter night. The fact that electric lights were used to even up the length of daylight to that of the hours of darkness on the pens in this test, makes it quite possible that a greater difference would have been noticed against the late hatched, had lights not been used. From the results of three years it is safe to say that pullets must be hatched early enough to become fully matured before cold weather sets in, if the most profitable production is to be expected during the winter months.

The following tables will give the results of the test during 1921-22 and also the results of the three years that this test has been carried on:—

## EARLY VERSUS LATE HATCHED PULLETS

*Lot No. 1 (Early) (25 Birds)*

Month	Cost of feed	Eggs laid	Value of eggs	Profit over cost	Profit per bird
	\$ cts.		\$ cts.	\$ cts.	\$ cts.
1921-22					
November.....	3 88	442	23 94	20 06	0 80
December.....	3 95	454	23 97	25 02	1 00
January.....	4 07	436	20 07	16 00	0 64
February.....	4 25	336	14 00	9 75	0 39
Total.....	16 15	1,668	86 98	70 83	2 83

NOTE.—Lot No. 1 laid 232 eggs in October previous to test.

*Lot No. 2 (Late) (25 Birds)*

Month	Cost of feed	Eggs laid	Value of eggs	Profit over cost	Profit per bird
	\$ cts.		\$ cts.	\$ cts.	\$ cts.
November.....	3 75	135	7 31	3 56	0 14
December.....	3 80	375	23 91	20 11	0 80
January.....	3 95	357	16 45	12 50	0 50
February.....	4 10	257	10 71	6 61	0 26
Total.....	15 60	1,124	58 37	42 78	1 70

## SUMMARY FOR FOUR MONTHS IN 1921-22

	Cost of feed		Eggs laid	Profit over cost		Average profit	
	\$	cts.		\$	cts.	\$	cts.
Lot No. 1 (Early).....	16	15	1,668	70	83	2	83
Lot No. 2 (Late).....	15	60	1,124	42	78	1	70

Lot No. 1 were hatched between April 7 and April 15.  
 Lot No. 2 were hatched between May 1 and May 10.

## EARLY VERSUS LATE HATCHED PULLETS

## SUMMARY OF THREE YEARS' RESULTS

	Cost of feed		Eggs laid	Profit over feed		Profit per bird	
	\$	cts.		\$	cts.	\$	cts.
1919-20							
Early.....	27	51	750	24	21	0	96
Late.....	27	44	736	21	98	0	87
1920-21							
Early.....	26	77	1,798	93	34	3	73
Late.....	24	75	1,068	43	89	1	75
1921-22							
Early.....	16	15	1,668	70	83	2	83
Late.....	15	60	1,124	42	78	1	70

Average profit per bird over cost of feed for four winter months during the past three years from early hatched pullets, was \$2.51.

Average profit per bird over cost of feed for four winter months during the past three years from late hatched pullets, was \$1.44.

A continuation of the test was started November 1, 1922, with the results to date as follows:—

## Lot No. 1 (Early) (25 Birds)

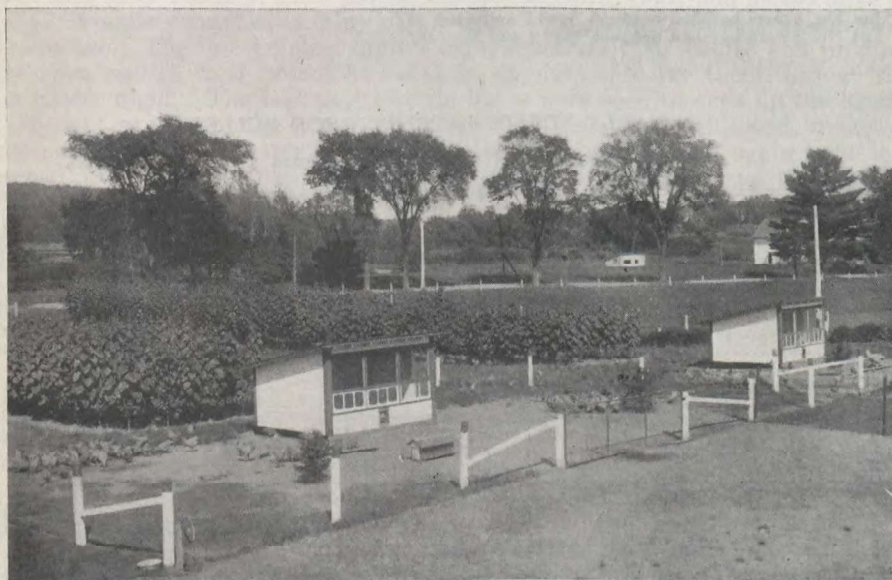
Month	Cost of feed		Eggs laid	Value of eggs	Profit over loss	Profit per bird			
	\$	cts.					\$	cts.	\$
November.....	4	80	248	12	40	7	60	0	30
December.....	4	65	427	26	67	22	02	0	88
Totals.....	9	45	675	39	07	29	62	1	18

## Lot No. 2 (Late) (25 Birds)

November.....	5	15	104	5	20	0	05	0	00½
December.....	5	00	282	17	62	12	62	0	50
Totals.....	10	15	386	22	82	12	67	0	50½

### QUEBEC WESTERN EGG-LAYING CONTEST

During the summer of 1922, a building was built just west of the Poultry Division to house the birds entered for an Egg-Laying Contest to be commenced on November 1. This building is 16 feet wide by 136 feet long, having a feed room in the centre 16 feet square, and ten pens 6 feet wide by 16 feet deep, in each end of the building, making twenty pens in all. The building faces the south, is of the straw loft type and is giving good satisfaction. Each pen contains ten birds which must remain in the Contest fifty-two weeks. A report of



Sunflowers used as protection and shade for growing chickens

the production of the birds is mailed to each contestant every week. There are nine pens of Barred Rocks, six of White Leghorns, four White Wyandottes and one pen of Rhode Island Reds. The following are the contestants:—

- Pen 1 Thos. Mason, Lennoxville, Que., White Leghorns.
- 2 Jos. Williams, Sawyerville, Que., White Leghorns.
- 3 H. S. Beane, Beebe, Que., White Leghorns.
- 4 Elmhurst Poultry Farm, Montreal West, Que., White Leghorns.
- 5 J. B. Briggs, Villa La Salle, Que., White Leghorns.
- 6 E. G. White, Lennoxville, Que., White Wyandottes.
- 7 H. S. Beane, Beebe, Que., White Wyandottes.
- 8 J. MacDermot, Montreal, Que., Rhode Island Reds.
- 9 L. A. Dean, Thetford Mines, Que., Barred Rocks.
- 10 M. T. Armitage, Sherbrooke, Que., Barred Rocks.
- 11 Laurel Poultry Farm, Rougemont, Que., Barred Rocks.
- 12 A. P. Hillhouse, Bondville, Que., Barred Rocks.
- 13 E. T. Poultry Farms, Foster, Que., White Leghorns.
- 14 D. D. Dowding, Howick, Que., Barred Rocks.
- 15 Experimental Farm, Lennoxville, Que., Barred Rocks.
- 16 Experimental Farm, Lennoxville, Que., Barred Rocks.
- 17 Experimental Farm, Lennoxville, Que., Barred Rocks.
- 18 Miss R. G. Knight, Beebe, Que., White Wyandottes.
- 19 C. Warner, Lennoxville, Que., White Wyandottes.
- 20 H. R. Drew, North Hatley, Que., Barred Rocks.

A great deal of interest has already been taken in the work of the contest by the public, and it is expected that the work will be a great benefit towards the betterment of poultry conditions throughout the district.

## BEES

On the whole the season was unfavourable for bees. April and May were bright and clear but too cool to promote a maximum of activity. June was characterized by damp cloudy weather and an abundance of rainfall. This caused a scarcity of nectar available for the bees, and shortened their working hours to such an extent that practically no surplus was gathered. For the first time since bees have been kept at this Station, they were not observed working on either alsike or White Dutch clover.

The colonies were removed from the cellar on April 8. Of the two hives placed in storage in the fall of 1921 one came through the winter in good condition. The other was weak and queenless and was united with the stronger colony. Later in the season a colony, in a ten-frame Langstroth hive, was received from Ottawa and from this two good nuclei were made. The original colony that was wintered here became queenless and was united with the nuclei on the 8th of August, as it was being robbed by the other colonies, and was found to be in a weakened condition.

The hive from which the nuclei were taken produced forty-five pounds of extracted honey.

The fall was very favourable for building up and when last examined the bees covered an average of seven frames per hive.

The colonies were fed with a sugar syrup, made of two parts of sugar to one of water, between the 27th and 30th of September. The feeding was done with a feeder made from a ten-pound honey pail, which proved very satisfactory. Each colony received sufficient syrup to bring the total weight up to seventy pounds.

The bees made their last general flight on the 3rd of November and were placed in the cellar on the 16th of the same month.

An exhibition hive was shown in connection with the various fairs throughout the Townships. This created an unusual interest and many people had an opportunity of observing a queen laying eggs.

## FLAX FOR FIBRE

Long Stem Ottawa No. 52, and Dutch Blue Blossom, two varieties of fibre flax, were grown during the past season. The land chosen for this experiment was a fairly stiff loam that had been in clover the previous season. It was lightly manured and ploughed during late fall, and brought into a good state of tilth on May 12 by discing, harrowing and rolling. The seed was sown broadcast, at the rate of ninety pounds per acre, on May 13, and covered with the drag harrow. After seeding and harrowing the land was rolled again. Each variety occupied a plot one-tenth acre in area.

Both varieties germinated well and growth was good until June 21 when a very heavy rainfall was responsible for the flooding of the area for seven hours. The next few days were warm and bright and as a result the soil baked badly. This caused a severe check to the crop, and, although seasonal conditions were ideal for the balance of the growing period, the growth was uneven and the resulting crop of ununiform quality.

A considerable difference was noted in the yield, quality and maturity of the two varieties. Long Stem Ottawa No. 52 matured in seventy-four days and was pulled on July 26. The straw was 39.3 inches long and of good strength. The actual yield of unthreshed straw was 1 ton 1,960 pounds per acre. Dutch Blue Blossom matured in seventy days and was pulled on July 22. The straw was 37.2 inches long and of only fair strength, while the actual yield amounted to 1 ton 1,270 pounds per acre.



After pulling and drying, the unthreshed straw was shipped to the Central Experimental Farm, Ottawa, for threshing, retting and scutching. The results from this work are not available at the time of writing.

## EXTENSION WORK

### EXCURSIONS

On January 12 the men and boys taking part in the three days' Short Course at Lennoxville, visited the Farm for the purpose of judging Ayrshires and Shorthorns. These classes were very ably handled by Mr. E. S. Archibald and Prof. Barton. The Farm also furnished swine, market lambs and horses for demonstration and judging work. This being the first year of the Short Course, the Committee in charge of this work were very much encouraged by the attendance and interest shown, which will warrant the continuance of the Course another year.

The eighth annual Farmers' Day was held this year on August 16. The weather being ideal the attendance was the largest of any gathering of this kind ever held. The usual interest was taken by the visitors in the work carried on, and every one was delighted to have present to address them, Dr. Grisdale, Deputy Minister, Mr. E. S. Archibald, Director Experimental Farm System, Dr. Charron of the Provincial Department of Agriculture, St. Hyacinthe, Miss Roach, of Macdonald College, and others.

We all felt highly honoured in having a short visit for the first time in the month of September, from the Hon. Mr. Motherwell, newly appointed Minister of Agriculture, who was accompanied by our good friends, Dr. Grisdale and Mr Archibald.

We also had the privilege of a visit in September from quite a large delegation of prominent farmers and agriculturists from the district below Quebec, who were touring the Eastern Townships.

Much interest was shown by a large number of visitors to the Farm throughout the year, in the various lines of work being carried on in the different Divisions.

Parties from outside districts and different organizations were pleased to have an opportunity to use the lawns for small gatherings, picnics, tennis and other sports during the summer.

### EXHIBITIONS

The first exhibition attended in the year 1922 was that of the Sherbrooke Poultry Association, Sherbrooke, at which the poultry exhibit in connection with the Farm was staged under the charge of Mr. J. D. Lang, Poultryman. There were exhibited certain individual Barred Rocks from our Farm showing the improvement in higher egg production that has been accomplished since starting, by trap-nesting and selection. There were also legends and transparencies which added much to the appearance and interest of the exhibit.

The first fall fair attended with the Farm exhibit was the Seventy-third Annual Fair of Stanstead County, which was held at Ayer's Cliff, Que., August 22, 23 and 24. The committee in charge was kind enough to allot us a very prominent space in their main building of thirty feet frontage, in which practically all divisions of the Farm were represented. Much interest was taken, questions asked, and a good amount of literature distributed. Mr. Browne, assistant to the superintendent, was in charge of this exhibit.

The next fair following Ayer's Cliff was the Eastern Townships Agricultural Association Exhibition, held at Sherbrooke from August 26 to September 2.

This being the largest exhibition in southern Quebec and attended by a large number of visitors, special attention is always given the Farm exhibit at this fair. Through the hearty co-operation of the directors of this organization, it was made possible for us to secure the central space in the main building as a permanent location for the Farm exhibit. All branches of the Farm were very well represented. This exhibit was in charge of Messrs. MacCharles, Browne and Lang.

Brome was the next fair attended. This being the largest exhibition in Bedford district, owing to its proximity to the Vermont boundary line, there is always a large number of American visitors. The exhibit was in charge of Mr. MacCharles, assistant to the superintendent.

The last attended, but by no means the least, was the Cookshire Fair held under the auspices of Compton Agricultural Society No. 1. This being the second year that this exhibition has been in operation, much credit is due the organization for the success they have achieved, especially in the high standing of their exhibits and the buildings they have equipped for the handling of the same. The exhibit was in charge of Messrs. MacCharles, Browne and Lang.

## MEETINGS

The superintendent, as well as others of the staff, acted as judges of live stock, poultry, cereals, fruit and vegetables at a large number of fairs in the Eastern Townships, and also attended numerous meetings throughout the year.

## GENERAL FARM NOTES

### BUILDINGS

There was erected, during the course of the summer, a poultry house 16 by 136 feet, for the accommodation of the Western Quebec Egg-Laying Contest, which is under way at present. This house accommodates twenty pens of ten birds each, and it is located west of the superintendent's house.

One of the old barns at the Ward farm, 35 by 45 feet, was moved, raised on a concrete foundation and made part of the permanent barn already there. This makes a very serviceable structure, 35 by 90 feet, for live stock work.

A certain amount of repair work was done on the Ward house, foreman's house and boarding house, such as painting, shingling and other minor repairs.

The dairy barn was painted inside, and two rooms were finished off in the upper story of the dairy building for the accommodation of the employees of the live stock division.

### ROADS

The only new road built this year is the one passing in front of the new contest house, connecting the driveways of the two brick cottages that are located to the east and west of said building.

Quite a large amount of work had to be done to repair washouts caused by a very heavy cloudburst, that was experienced in this district, in the month of June.

A light surfacing of gravel was applied to all roads where necessary and dragging done whenever conditions required it.

## FENCES

Three hundred and sixty rods of permanent fences were erected in the past season, practically all of it on the Ward farm, one hundred and seventy rods being on the north side of the Cookshire road.

## CLEARING LAND

Thirteen acres of old permanent pasture land on the Ward farm were cleaned, broken and got into proper condition for cropping next spring. One hundred and seventy rods of roadside on the Ward farm were cleaned of stumps and rocks and graded in proper shape for the new fence which was erected on same.