DOMINION OF CANADA

DEPARTMENT OF AGRICULTURE

DOMINION EXPERIMENTAL FARMS

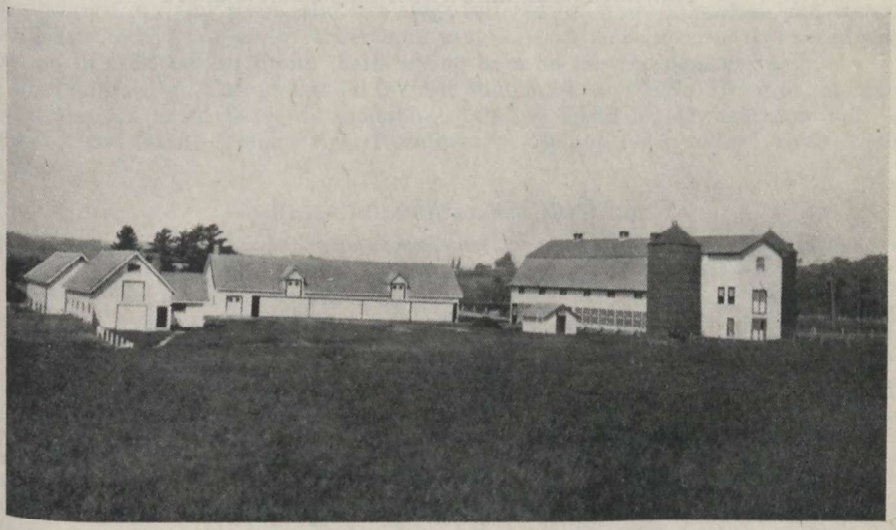
EXPERIMENTAL STATION

LENNOXVILLE, QUE.

INTERIM REPORT OF THE SUPERINTENDENT

J. A. McCLARY

FOR THE YEAR 1921



Dairy and Sheep Barns, Piggery and Implement Shed.

Printed by Authority of the Hon. W. R. Motherwell, Minister of Agriculture, Ottawa, 1922.

OTTAWA
F. A. ACLAND
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1922

EXPERIMENTAL STATION, LENNOXVILLE, QUE.

Report of the Superintendent, J. A. McClary

THE SEASON

The weather during the month of January was considerably milder than in 1920, with just sufficient snow for good sleighing. February also was very mild with a mean temperature of 16·76 degrees, compared with 12·65 degrees for the same month last year.

March was mild. The ice cleared out of the St. Francis river on March 9, eighteen days earlier than in the spring of 1920.

The sugar season was two weeks earlier than usual, with a light yield.

The weather during the month of April was mild; ploughing was commenced on the 7th, and seeding on the 20th, which was practically all finished that month with the exception of corn and roots.

Plum trees were in bloom on April 28. Throughout May the weather was very dry, which was detrimental to the grain, the total precipitation being only 0.84 inch. June being exceptionally dry and warm, the hay crop was materially affected. Haying was commenced on the 21st, with sixty per cent yield.

July continued warm and dry, and grain ripened very short and light. August still continued dry and warm, and live stock suffered for want of pasture and water. Grain was threshed two weeks earlier than usual. Corn made good progress and was harvested in excellent condition, there having been no frost to damage it.

The rainfall of 3.94 inches in October did much to relieve the drought, and enabled farmers to do their fall ploughing. Only a small amount of snow fell in December, and the St. Francis river froze over on the 15th, eleven days earlier than last year.

METEOROLOGICAL RECORDS, 1921

—	Temperatures					Precipitation			Total Hours Sunshine
	Maximum		Minimum		Mean Degrees	Rainfall in Inches	Snowfall in Inches	Total in Inches	
	Date	Degrees	Date	Degrees					
January	12	44	19	−26	11·27	0·75	0·65	1·40	106·6
February	17	48	21	−16	16·76	0·47	0·80	1·27	90·6
March	27	70	19	−11	37·11	2·27	0·80	3·07	141·2
April	27	78	2	−15	46·28	1·54	0·55	2·09	195·9
May	21	87	11	22	53·36	0·74	.....	0·74	250·3
June	29	91	2	30	60·14	1·78	.....	1·78	247·7
July	7	98	16	42	72·18	3·29	.....	3·29	226·5
August	30	85	16	31	62·09	1·87	.....	1·87	242·1
September	2	80	27	30	58·23	1·49	.....	1·49	197·6
October	15	68	26	17	44·40	3·94	.....	3·94	141·1
November	19	66	26	−6	28·00	1·18	2·52	3·70	55·2
December	18	53	30	−29	15·98	0·19	1·30	1·49	52·3
Total	.....	.....	.....	.....	.....	19·51	6·62	26·13	1,947·1

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ANIMAL HUSBANDRY

BEEF CATTLE

On account of the large amount of hay and ensilage grown at this Station, there were purchased, over and above the breeding stock carried, ninety two- and three-year-old stockers from sections of the Eastern Townships where beef breeds still predominate. Different lines of experimental work were conducted, such as long versus short grain feeding period, elevator screenings versus grain feeding mixture and loose versus tied.

Following will be found tables showing results of the above mentioned experiments.

STEER FEEDING EXPERIMENT

Project 1.—EARLY VS. LATE GRAIN FEEDING OF STEERS

Object in View.—To ascertain the relative economy of feeding grain immediately the steers are stabled, compared with starting grain feeding two and four months later.

Procedure.—Three lots of steers, six in each, were selected. All were given the same roughage ration and care, but lot No. 1 was started on grain feeding November 15, lot No. 2, January 15, and lot No. 3, March 15. The grain mixture consisted of one part ground corn, one part ground oats, and one part ground elevator screenings. It was fed at the rate of three pounds a day at the beginning, and gradually increased to seven pounds a day. The following table gives the results:—

EARLY VS. LATE GRAIN FEEDING OF STEERS

—		Lot 1	Lot 2	Lot 3
Started grain feeding		Nov. 15	Jan. 15	Mar. 15
Number of steers		6	6	6
Gross weight Nov. 6, 1920	lbs.	5,630·0	5,449·0	5,930·0
Average weight Nov. 6, 1920	"	938·3	908·1	988·3
Gross weight May 26, 1921	"	7,185·0	6,675·0	7,115·0
Average weight May 26, 1921	"	1,197·5	1,112·5	1,185·8
Total gain in 195 days	"	1,555·0	1,226·0	1,185·0
Average gain per steer in 195 days	"	259·1	204·3	197·5
Average gain per steer per day	"	1·33	1·05	1·01
Silage eaten by group	"	25,272·0	25,272·0	25,272·0
Hay eaten by group	"	11,700·0	11,700·0	11,700·0
Grain eaten by group	"	7,092·0	5,046·0	3,099·0
Total cost of feed	$	211·43	186·99	151·46
Cost of producing 1 lb. gain	$	·136	·153	·128
Feed consumed per pound of gain:—				
Silage	lbs.	16·2	20·6	21·3
Hay	"	7·52	9·5	9·9
Grain	"	4·56	4·1	2·61

From the table it would appear that lot No. 3, which received grain for only two months, made cheaper gains than lots Nos. 1 and 2. However, owing to better quality, lot No. 1 brought $1 and lot No. 2, 50 cents per hundred more than lot No. 3, so that, in reality, the cheapest gain was made by the steers which were fed grain for the longest period.

Project 1a.—GROUND ELEVATOR SCREENINGS VS. CORN, OATS AND SCREENINGS

Object in View.—To ascertain the relative values of elevator screenings versus corn, oats and sceenings, mixed as a grain ration for beef production.

Procedure.—Two lots of eight steers each were tied in the barn on November 6. They were fed hay and ensilage until January 15, when lot No. 1 was given a meal ration of 3 pounds of ground elevator screenings per day, and lot No. 2, 3 pounds of equal parts of ground corn, elevator screenings and oats. This ration was increased with both lots until they were getting seven pounds per day by the end of the period. Both lots received the same hay and silage ration. The following table gives the results obtained:—

GROUND ELEVATOR SCREENINGS VS. CORN, OATS AND SCREENINGS

		Lot No. 1	Lot No. 2
		Fed equal parts corn, oats and screenings	Fed ground screenings only
Number of steers in lot		8	8
Gross weight Nov. 6, 1920	lbs.	8,310·0	7,696·0
Gross weight May 20, 1921	"	10,015·0	9,296·0
Average weight Nov. 6, 1920	"	1,038·7	962·0
Average weight May 20, 1921	"	1,251·8	1,162·0
Total gain in 195 days	"	1,705·0	1,600·0
Average gain per steer in 195 days	"	213·1	200·0
Average daily gain	"	1·09	1·03
Hay eaten daily per steer	"	10·0	10·0
Silage eaten daily per steer	"	21·6	21·6
Meal ration, corn, oats, screenings	"	4·3	.....
Meal ration, screenings alone	"	.....	4·0
Cost of feed per steer for period	$	31·16	26·35
Cost of feed per pound gain	cts.	14·6	13·18
Feed consumed per pound of gain:—			
Silage	lbs.	19·8	20·9
Hay	"	9·1	9·7
Grain	"	3·94	3·88

From the above table it appears that the steers fed on corn, oats and screenings made slightly better gains, but those gains were made at a cost of 1.42 cents per pound more than the gains made by lot No. 2.

LOOSE VERSUS TIED

Object in view.—To ascertain the most economical way of handling beef steers, considering cost of feed, labour and equipment.

Procedure.—Two lots of ten steers have been used in this experiment each year, one lot allowed to run loose in a large pen, while the second lot was tied up in the stable. Both lots were fed exactly the same ration of hay, ensilage and meal, accurate records having been kept of the amounts fed each lot during the course of the experiment. The weights of the steers were taken in November when they were stabled and again in May when they were sold. The results for three years are given in the following table:—

—		1919	1920	1921	Average
Number of steers in each lot		10	10	10	10
Total weight Nov. 10 (loose)	lbs.	8,380·0	8,780·0	8·775·0	8·645·0
Total weight Nov. 10 (tied)	"	8,537·0	9,326·0	10,387·5	9,416·8
Total weight May 10 (loose)	"	10,565·0	11,870·0	11,305·0	11,246·7
Total weight May 10 (tied)	"	10,600·0	12,340·0	12,518·8	11,819·6
Total gain in 6 mos. (loose)	"	2,185·0	3,090·0	2,530·0	2,601·7
Total gain in 6 mos. (tied)	"	2,063·0	3,014·0	2,131·3	2,402·8
Average gain per steer (loose)	"	218·5	309·0	253·0	260·17
Average gain per steer (tied)	"	206·3	301·4	213·1	240·3
Average daily gain (loose)	"	1·2	1·7	1·4	1·4
Average daily gain (tied)	"	1·14	1·66	1·17	1·32
Daily Ration:—					
Hay	"	10·4	10·0	10·8	10·4
Silage	"	25·0	25·0	23·2	24·4
Meal	"	4·0	3·2	4·67	3·96
Feed Required per pound gain:—					
Hay (loose)	"	8·6	5·8	7·7	7·4
Hay (tied)	"	9·1	6·0	9·2	8·1
Silage (loose)	"	20·7	14·6	16·6	17·3
Silage (tied)	"	21·9	15·0	19·7	18·86
Meal (loose)	"	3·3	1·9	3·3	2·83
Meal (tied)	"	3·5	1·9	3·97	3·12
Cost of feed per pound gain (loose)	cts.	14·8	9·3	12·94	12·36
Cost of feed per pound gain (tied)	"	15·7	9·5	15·50	13·56
Average gain per steer of loose over tied	"	12·2	7·6	39·9	19·90

The table shows greater average gain in weight for the steers allowed to run loose. This, also having in view the saving of labour and equipment, would undoubtedly enable steers running loose to make cheaper gains.

DAIRY CATTLE

AYRSHIRES

The Ayrshire herd comprises thirty-six head, consisting of one five-year-old herd bull, "Ottawa Master" -52603-, fifteen cows, eight two-year-old heifers, seven yearlings and four young bulls.

This herd is under accreditation and passed through the last test without any reactors. The cows in the herd are entered in the Record of Performance as soon as they freshen. A number have completed their record and qualified, and others, which have not finished their lactation period, have made good records so far and are expected to have a good margin to their credit at finishing.

The farmers are beginning to realize more than ever the importance of R.O.P. records, as practically every person inquiring for a herd sire is looking for one from a R.O.P. dam as well as from an accredited herd or one under accreditation, and the herd with the good average milk production is what is being looked for at present.

Following will be found records of cows which finished their lactation period in 1921. There are a number still milking which freshened in 1921, whose records will appear in the next report.

Name of Cow	Date of calving	Number of days in lactation	Total pounds Milk for period	Daily average yield of Milk	Average per cent Butter Fat	Pounds of Butter Produced	Value of Butter at 30 cts. per pound	Value of Skim Milk at 20 cts.	Total value of Product	Meal eaten at 1½ cts. per pound	Roots and Silage eaten at $2 per ton	Hay eaten at $7 per ton	Green Feed eaten at $3 per ton	Months on pasture at $1	Total cost of Feed	Cost of producing 100 pounds of Milk	Cost of producing 1 pound Butter	Profit on one pound Butter	Profit over feed per Cow
							$	$	$	lbs.	lbs.	lbs.	lbs.		$	cts.	cts.	cts.	$
Lennoxville Mary	May 6, 1920	270	6,419·5	23·77	4·3	326·80	98·04	12·18	110.22	2,763	6,935	2,014	.....	4	52.43	81	15.1	14·9	57.79
Lennoxville Bettina	May 20, 1920	314	7,324·4	23·32	4·0	344·67	103.40	13.96	117.36	3,501	7,114	1,798	.....	4	61.16	76·6	17·7	12·3	56.20
Annabel	Aug. 2, 1920	205	3,079·5	15·02	3·7	136·90	41·07	5.88	46.97	1,784	5,715	1,914	.....	3	37.72	122·2	27·5	2·5	9.25
Lennoxville Marjorie	Jan. 20, 1920	377	6,525·0	17·53	4·7	362·60	108.78	12.32	121.10	3,043	9,595	2,750	.....	4	61.27	93·9	16·8	13·2	59.83
Eva of Avonmore	Oct. 9, 1920	321	6,712·6	20·91	3·6	284·74	85.42	12.85	98.28	2,852	5,945	1,394	30	3	49.51	73·8	17·4	12·6	48.77
Daisy of Bridgeview	Oct. 16, 1920	306	6,101·8	19·94	3·3	234·78	70.50	11.73	82.24	2,763	5,951	1,354	15	2·5	47.75	78·3	20·3	9·7	34.49
Pauline's Pride	Sept. 18, 1920	309	7,005·7	22·67	3·9	328·58	98·57	13·35	111·93	3.323	5,024	1,682	30	4·8	57.23	81·7	17·4	12·6	54.70
Lennoxville Roxie	Oct. 16, 1920	314	7,350·0	23·41	4·2	367·41	110.22	13.96	124.19	3,238	6,015	1.442	30	4	55·57	75·5	15·1	14·9	68.62
Pretty of Avonmore	April 13, 1921	241	7,023·1	29·13	3·9	329·00	98·70	13.39	112.09	2,387	2,622	696	1,216	3·3	40·05	56·9	12·1	17·9	72.04
Oakland Dairymaid	April 14, 1921	240	8,331·9	34·70	3·5	340·86	102.20	15·98	118·24	2,978	7,138	1,847	1,216	3	55.65	66·8	16·3	13·7	62.59
Average	.....	289·7	6,587·15	23·04	3·94	305.63	91.69	12.56	104.26	2,863	6,195	1,689	253·7	3·6	51·83	80·65	17·6	12·4	52.43

Cost of Feeding Ayrshire Heifers from Birth to Two Years

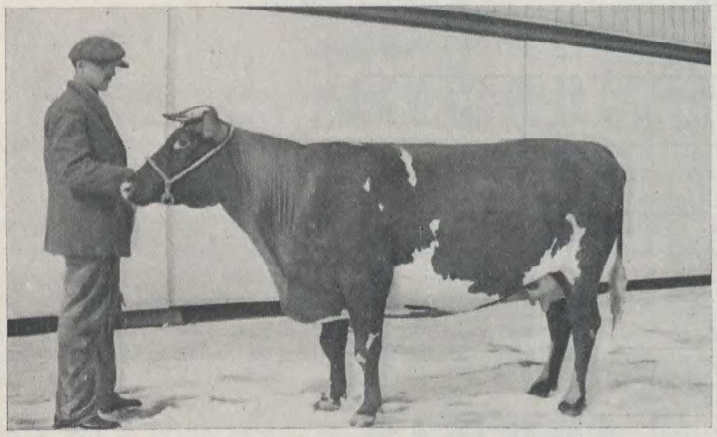
Project 13.—The following table gives the total amount of feed required to raise each one of eight pure-bred Ayrshire heifers from birth to two years of age:—

Names	Whole milk, $1.50 per cwt.	Skim-milk, 25c. per cwt.	Meal, 1½c. per lb.	Ensilage, 15c. per cwt.	Hay, $10 per ton	Pasture, mos.	Total cost of feed
	lbs.	lbs.	lbs.	lbs.	lbs.		$ cts.
Lennoxville Beauty 3rd	284	3,783	1,646	4,570	3,016	4	64 35
Lennoxville Annabel	631	2,900	1,443	3,947	2,585	6	63 12
Lennoxville Bluebell 3rd	560	4,145	1,577	3,171	2,771	6	67 04
Lennoxville Roxie 2nd	542	4,635	1,760	3,119	2,765	4	68 63
Lennoxville Doreen 2nd	580	4,220	1,578	3,419	2,856	7	64 23
Lennoxville Halcyon	408	2,188	1,652	5,595	2,906	5	64 29
Lennoxville Mary 2nd	833	2,837	1,565	2,618	2,721	5½	66 11
Lennoxville Marjorie 2nd	1,154	3,125	1,563	3,000	2,155	5½	69 80
Average	624	3,479	1,573	3,680	2,722	4¾	65 95

SHORTHORNS

The Shorthorn herd at this Station at present consists of six cows, three two-year-old heifers, one yearling heifer, one heifer calf and five young bulls under one year.

The females in the herd are practically all of Scotch breeding. One object with this herd is to see what improvement in the milking quality can be made by selecting sires with milk production behind them and, at the same time, retain their beef qualities. For this purpose, there has just been purchased, from the Weldwood herd of London, Ont., a two-year-old bull, "Weldwood Lassie's Lad" =135100=. This



Shorthorn Heifer, "Jubilee 18th"—160583—which just completed an R. O. P. record of 9,236 lbs. milk and 386.7 lbs. butter-fat as a three-year-old.

bull is of exceptionally good dual-purpose build and quality, whose breeding, both as regards ancestry and milk, would do credit to any Shorthorn herd. His dam, Jean Lassie, has an official record as a three-year-old of 13,891 pounds milk. He is sired by Burnfoot Chieftain, whose dam was Dairymaid. Mated with the females in the Lennoxville herd, it is expected that the progeny will be of choice dual-purpose quality.

We have one three-year-old heifer, "Jubilee 18th" =160583= which has just completed a very creditable R.O.P. record of 9,236 pounds of milk and 386.7 pounds of butter fat in 364 days. She is developing into a large, strong and very typey cow.

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

MILKING MACHINES

There are in operation at this Station at present two single-unit Empire and one Macartney milking machine. The single units are used as all the cows are in the R.O.P. test, which makes it impossible to use the double unit machine. These machines have given satisfaction. In November, 1920, we gave up using the machines for a certain time to see what the results would be in the milk production, and they were started again in the month of February. In each case the falling-off in milk was very noticeable, but considerably more so, when hand-milking was adopted for machine-milking. In several cases heifers that strongly resented hand-milking have been very easily won over by the machine milker. In all cases of heifers and in most cases of mature cows, the cattle stand quietly, seem less annoyed and milk down more fully than by hand milking.

It is not claimed that the two makes of machine now in use on the Station are any better than other standard makes. Any make that has stood the test of the public market for ten years would be a safe investment.

HORSES

The horses at this Station consist of two registered Clydesdale mares, ten draught horses, one carriage horse and one two-year-old gelding.

No feeding experiments have been conducted with horses in 1921, but the following feeds are used in the ration: One part bran and three parts oats. In heavy working seasons when oats are light, one-quarter corn is added.

WINTERING OF IDLE HORSES

Project 18.—Any idle horses in the winter are fed on hay, roots and a small quantity of bran. Ensilage has also been used instead of roots, as a supplement to hay, in wintering idle horses, and has given very good results.

COST OF HORSE MAINTENANCE, 1921-22

Number of work horses at Station		13
Average value of each horse		$ 200.00
Hours work done during year		20,565
Average number of hours' labour per horse		1,581.9
Average number of 10-hour days worked per horse		158.2
Cost of feed—		
69,992 pounds hay eaten at 75 cents per cwt.	$524.94	
49,475 " oats eaten at $1.75 per cwt.	865.81	
7,305 " bran eaten at $1.25 per cwt.	91.31	
Total cost of feed for 13 horses		$1,482.06
Average cost of feed per horse		114.00
Cost of feed required to produce 1 hour horse labour		7.2 cts.
Cost of feed for 13 horses		$1,482.06
Veterinary fees, medicine, etc.		25.00
Horse shoeing		103.10
Repairs to harness		76.65
Brushes, sweat pads, etc.		40.00
Stableman's labour, 2,990 hours at 31 cents		926.90
Interest on $3,500 for 1 year at 5 per cent.		175.00
10 per cent depreciation in value of horses over 8 years old		105.00
10 per cent depreciation in value of buildings and equipment		90.00
		$3,023.71
Total cost of one hour horse labour		14.7 cts.

TRACTOR

The Cleveland (Cletrac) tractor at this Station has done much in the busy seeding season as well as in ploughing in the fall to relieve horse labour. Although the purchase of a tractor for small farms is not advocated, as it cannot take the place of horses on the farm, there is certainly a place for the tractor on a farm of three to four hundred acres, as it is very useful in spring for discing and ploughing, etc., enabling the farmers to get their crops in earlier, from which the best and heaviest yields are obtained.

The tractor is one of the best belt powers for operating threshers, ensilage cutters and other farm implements requiring belt power.

As per figures on the Lennoxville Station, oil, gasoline and labour, it cost $2.83 to plough one acre.

COST OF TRACTOR OPERATION, 1921-22

Type of tractor used, Cletrac 12-20 h.p.		
Original cost		$1,200.00
Purchased, 1920.		
Hours draw-bar work done in one year		273
Hours belt work done in one year		191
Total hours work done		464
Number of 10-hour days worked during year		46.4
Expenditures—		
540 gallons gasoline at 35 cents	$189.00	
30 " cylinder oil at $1.25	37.50	
Transmission oil and grease	15.00	
Total cost of gasoline, oil and grease		$241.50
Average cost per hour, gasoline, oil and grease		.52 cts.
Total cost of fuel, oil and grease for one year		241.50
82.5 hours repair work at 33 cents		27.23
Repairs		106.75
12½ per cent depreciation		150.00
Interest on $1,200 for 1 year at 5 per cent		60.00
		$585.48
Total cost of one hour tractor work		$1.26

COMPARATIVE COSTS OF HORSES VS. TRACTOR FOR FARM WORK

First cost of tractor	$1,200.00
Cost of one horse	200.00
Cost of harness for one horse	40.00
Number of harnessed horses that can be bought for price of tractor	5
Cost of 1 hour tractor labour	1.26
Cost of 1 hour horse labour	14.7 cts.
Cost per hour of one 3-horse and one 2-horse team with teamsters	1.25½
Cost per hour of tractor with operator	1.59

For ploughing throughout most of the eastern townships, one three-horse and one two-horse team will plough as much in a day as a tractor.

For discing, a tractor will do as much work as two four-horse teams. On that basis the relative costs for discing are:—

Two four-horse teams with teamsters for 1 hour	$1.80
Tractor with operator	1.59

SHEEP

The sheep on this Station are of the Oxford Down breed. The flock numbers sixty-eight head, made up as follows: One registered ram, ten registered ewes, three registered lambs, forty high-grade breeding ewes, nine grade lambs and five experimental feeders.

The Oxford Down ram, "Bruce" 46'19 =13130= from P. Arkell & Sons, is of excellent type and breeding. Much improvement in the grades is noted year by year, and at present they compare very favourably with the pure-breds in conformation, quality and clip of wool.

The marketable lambs and the wool are always marketed through the Sherbrooke County Wool Growers' and Sheep Breeders' Association. Co-operative grading and marketing have done much for this branch of live stock in this district.

The sheep are dipped twice a year, in spring after shearing and in fall when coming to the barn. This, together with proper racks to keep chaff and seeds out of the wool, has done a great deal to improve its grade. Dipping is a preventive of insects, and is very essential in order to get the maximum results for feed consumed.

The 1921 wool clip yielded 442 pounds of wool from 61 fleeces, an average of 7.24 pounds per fleece.

Following will be found the grading statement of wool and prices realized, also experiment in feeding lambs:

Project 102.—Wool Grading Experiment

Object in View.—To find whether quality and clip of wool cannot be improved by better feeding, care and dipping of sheep.

Procedure.—Four hundred and forty-two pounds of wool were graded and sold through the Sherbrooke County Wool Growers' and Sheep Breeders' Association, and graded as follows:—

273	pounds medium combing at 18 cents	$49.14
131	" low medium combing at 15 cents	19.65
24	" low combing at 11½ cents	2.70
14	" tags	
		$71.49
	Less fees—61 fleeces at 7 cents	4.27
		$67.22

Average weight per fleece, 7.24 pounds.
Average weight per fleece for 5 years, 7.10 pounds.

Project 19.—Feeding Market Lambs

Object in view.—To ascertain the profits derived from feeding market lambs.

Procedure.—Four average lambs were selected from a flock of twenty-three lambs that were marketed on November 12. The lambs sold at that date for 7 cents per pound. These four lambs were fed for fifty-nine days and sold on January 10 at 8½ cents per pound. Following will be found table giving weights, cost of feed and profit realized:—

Feeding Market Lambs

Number of lambs in lot		4
First weight gross, Nov. 12	lbs.	359.0
First weight average	"	89.75
Finished weight gross, Jan. 10	"	442.0
Finished weight average	"	110.50
Total gain in 59 days	"	83.0
Average gain	"	20.75
Average daily gain	"	0.35
Four lambs cost Nov. 12, 359 pounds at 7 cents		$25.13
Four lambs sold Jan. 10, 442 pounds at 8½ cents		37.57
Cost of feed for period—		
Hay, 196 pounds at $15 per ton	$1.47	
Roots, 150 pounds at $4 per ton	.30	
Grain, 247 pounds at $30 per ton	3.70	
Total cost of feed		5.47
Total cost of feed and lambs		30.60
Profit per lot		6.97
Profit per lamb		1.74
Feed consumed per pound of gain—		
Hay	lbs. 2.36	
Roots	" 1.8	
Grain	" 2.9	
Cost per pound of gain		$.066

SWINE

The Yorkshire is the breed kept at this Station, the herd comprising one boar and four brood sows. The sire, "Glenhodson Emperor F" —69124— is an individual of strong bacon type, good-sized and from a very prolific family. The same may be said, in a general way, of the four brood sows. Seventy-nine pigs were farrowed in the year; fifteen of them were lost, leaving a total of sixty-four pigs. A fair percentage of the pigs are sold at five weeks of age, for breeding stock, the balance are fed for pork and marketed when they weigh about two hundred pounds.

The breeding stock are housed, all seasons of the year, in portable hog cabins.

A supply of charcoal, sulphur and salt is kept where the pigs can get at it at any time.

Following are tables giving results of a feeding experiment comparing ground elevator screenings versus a mixture of ground oats, middlings, cornmeal and a small amount of oilmeal, and the cost of young pigs at weaning time.

Projects 20 and 21.—Swine Feeding Experiment

Ground Elevator Screenings vs. A Ration Made Up of Ground Oats, Middlings, Cornmeal and Oilmeal

Objects in View.—To find out whether more economical gains could not be made by feeding ground elevator screenings instead of the usual ration of ground oats, cornmeal, middlings and oilmeal.

Procedure.—Ten pigs were taken on February 8 and divided into two lots, lot No. 1, consisting of five pigs, was started on a meal ration of ground oats, middlings and a little oilmeal. Later on, cornmeal was added replacing the ground oats. Lot No. 2, consisting of five pigs, was carried through the feeding period of three months on a meal ration of ground elevator screenings.

The following table gives the gains made, the amount of feed used and the cost per pound of gain.

Swine Feeding Experiment

—		Lot No. 1	Lot No. 2
		Fed ground oats, middlings, cornmeal and oilmeal	Fed ground elevator screenings
Number of pigs in lot		5	5
Weight of lot, Feb. 8, 1921	lbs.	420	487·5
Weight of lot May 6, 1921	"	950	912·5
Gain per lot in 86 days	"	530	425
Average gain per pig in 86 days	"	106	85
Average gain per pig per day	"	1·23	·988
Feed consumed—			
Ground oats	"	895	.....
Middlings	"	634	.....
Cornmeal	"	505	.....
Oilmeal	"	75	.....
Ground elevator screenings	"	.....	2,125
Feed required to make 1 pound gain	"	3·98	5
Cost per pound of gain	cts.	8·5	6·6

COST OF YOUNG PIGS AT WEANING TIME

The following tables are made up from the records of four Yorkshire brood sows kept at this Station during 1921. Three sows had two litters each during the twelve months, the other only one. They were fed a meal ration made up of three parts ground elevator screenings to one part of bran. This was supplemented by feeding skim milk, roots and clover hay when available.

The young pigs were fed equal parts of ground oats and middlings when three weeks old and were weaned at six weeks of age. An average value of $50 per sow is given in order to obtain the interest charges. Labour and housing charges are omitted.

OTTAWA AUGUSTINE 69-61594

Number of pigs raised in 1921		20	
Cost of feed—			
566 pounds	bran at 1½ cents	$ 8.49	
1699 "	ground elevator screenings at 1¼ cents	21.25	
500 "	roots at $3 per ton	.75	
100 "	clover at 50 cents per cwt.	.50	
500 "	skim-milk at 25 cents per cwt.	1.25	
150 "	ground oats and middlings at .02 cents.	3.00	
	Pasture	.50	
Total cost of feed for sow and young pigs			$35.74
Cost of service			4.00
Interest on $50 for 1 year at 5 per cent			2.50
Total cost of 20 young pigs			$42.24
Cost per pig at 6 weeks of age			2.11

LENNOXVILLE AUGUSTINE A1—72110

Number of pigs raised in 1921		15	
Cost of feed—			
595 pounds	bran at 1½ cents	$ 8.93	
1784 "	ground elevator screenings at 1¼ cents	22.30	
150 "	ground oats and middlings at 2 cents	3.00	
500 "	roots at $3 per ton	.75	
100 "	clover hay at 50 cents per cwt.	.50	
500 "	skim-milk at 25 cents per cwt.	1.25	
	Pasture	.50	
Total cost of feed for sow and young pigs			$37.23
Cost of service			4.00
Interest on $50 for 1 year at 5 per cent			2.50
Total cost of 15 young pigs			$43.73
Total cost per pig at 6 weeks of age			2.92

LENNOXVILLE AUGUSTINE A2—72111

Number of pigs raised in 1921		14	
Cost of feed—			
589 pounds	bran at 1½ cents	$ 8.84	
1768 "	ground elevator screenings at 1¼ cents	22.10	
100 "	ground oats and middlings at 2 cents	2.00	
500 "	roots at $3 per ton	75	
100 "	clover hay at 50 cents per cwt.	50	
500 "	skim-milk at 25 cents per cwt.	1.25	
	Pasture	50	
Total cost of feed for sow and young pigs			$35.94
Cost of service			4.00
Interest on $50 for 1 year at 5 per cent			2.50
Total cost of 14 young pigs			$42.44
Cost per pig at 6 weeks of age			3.03

LENNOXVILLE AUGUSTINE A3—72112

Number of pigs raised in 1921		12	
Cost of feed—			
619 pounds	bran at 1½ cents	$ 9.29	
1858 "	ground elevator screenings at 1¼ cents	23.23	
100 "	ground oats and middlings at 2 cents	2.00	
500 "	roots at $3 per ton	.75	
100 "	clover hay at 50 cents per cwt.	.50	
500 "	skim-milk at 25 cents per cwt.	1.25	
	Pasture	.50	
Total cost of feed for sow and young pigs			$37.52
Cost of service			2.00
Interest on $50 for 1 year at 5 per cent			2.50
Total cost of 12 young pigs			$42.02
Cost per pig at 6 weeks of age			3.50
Total cost for 61 young pigs			$170.53
Average cost per pig			2.79

FIELD HUSBANDRY

THE SEASON

April, 1921, was unusually fine, enabling the farmers in this district to get on the land earlier than usual. The first ploughing was done April 7, the first seeding about the 20. By the end of the month, most of the early seeding was completed. The precipitation, 2.09 inches, was low compared with 4.62 inches for April, 1920. The dry weather continued during the month of May, the precipitation for that month being only 0.84 inch. Growth was checked by frosts which continued as late as June 10. Corn planted about May 20 was badly nipped by frost but recovered and made very good progress during the remainder of the season. Haying was begun at this Station on June 21, the yield being about 60 per cent of last year's. The weather continued dry so that the crop was all housed in excellent condition.

During July and August, corn and sunflowers made good growth, but oats, wheat and barley ripened early with a light yield of grain and straw. Owing to the shortage in the hay crop, many farmers cut their grain in the green stage and dried it for hay. At this Station nearly half of the grain crop was harvested and threshed by the first of August. Pastures suffered severely from the dry, hot weather, while brooks and wells dried up so that, in many cases, farmers were compelled to haul water for their stock. The rainfall for September was only 1.29 inches, the lowest recorded for that month at this Station. The ground became very dry and hard, making even the ploughing of stubble land impossible.

October was a fine month with plenty of rain which freshened the pastures and enabled the farmers to get their fall ploughing done. The first snowfall of the season came on November 5, before the ground was properly frozen, and when it melted a few days later it did more to replenish springs and wells than any rainfall during the year.

FIELD CROP AREAS AND YIELDS

—	Acreage	Total Yield		Yield per Acre		Date of Seeding	Date of Harvesting
		Tons	Bushels	Tons	Bushels		
Hay	184·0	250	.....	1·36	.....	.....	June 21 and July 23
Mixed grain, oats, wheat and barley	19·0	.....	297	.....	15·6	April 19.....	July 25-26
Mixed grain, oats, wheat and barley	5·0	.....	150	.....	30·0	April 20.....	July 26
Barley O.A.C. No. 21	1·5	.....	27	.....	18·0	May 12.....	July 28
Oats, Storm King	8·0	.....	284	.....	33·5	April 30.....	July 28-29
Oats, Banner	39·0	.....	1,203	.....	30·8	April 27-28...	Aug. 2-4
Oats, vetches and millet (silage)	18·0	57	.....	3·17	.....	May 4 and 19	Aug. 15-17
Corn and sunflowers (silage)	18·0	309	.....	17·17	.....	May 18-20....	Sept. 5-15
Swedes	1·0	.....	1,175	.....	1,175·0	May 14.....	Oct. 18

Very little clover showed in the first cutting of hay this year. A second crop was cut on part of the newly seeded ground but most of it was fed green to the milch cows.

The mixed grain was grown on a field lately taken over by the Station. The soil is clay and was badly runout which accounted, no doubt, for the light yield as compared with other fields which have been in the rotation for several years.

THE EFFECT OF COMMERCIAL FERTILIZER ON THE GROWTH OF CORN AND SUNFLOWERS FOR SILAGE

Project 107.—This experiment was carried on in order to ascertain the effect of supplementing barnyard manure with commercial fertilizer for corn, sunflowers, and corn and sunflowers mixed. The land was ploughed the fall of 1920 and manure applied during the winter at the rate of 16 tons per acre. The commercial fertilizer used contained; nitrogen, 0.82 per cent; phosphoric acid, 8 per cent; potash, 2 per cent, and was applied at the rate of 300 pounds per acre. Both corn and sunflowers were planted in rows 42 inches apart, extending the whole length of the field thus ensuring uniform soil conditions for the whole area taken up by the experiment. Each plot took up four rows 1,000 feet long, or nearly one-third of an acre. The variety of corn used in this experiment was Early Huron, the variety of sunflowers, Mammoth Russian.

The following table gives the results of the experiment:—

—	Yield per Acre		Increase in Yield per Acre
	Fertilized	Unfertilized	
Corn	11 tons 1,886 lb.	11 tons. 643 lb.	0 tons. 1,243 lbs.
Sunflowers	17 " 4 "	14 " 1,013 "	2 " 991 "
Corn and sunflowers	21 " 1,931 "	16 " 1,048 "	5 " 849 "

Corn alone was well along in the milk stage when it was cut on September 7.

Where the sunflowers were grown alone, the leaves up to two feet from the ground were withered and the stalks appeared to be dry and woody. Mixed with the corn they grew taller and carried green leaves down to the ground. Where there were fewer sunflowers in the rows, say one plant to five plants of corn, both corn and sunflowers seemed to do better than where they were more evenly mixed.

NEW EXPERIMENTS IN FIELD HUSBANDRY

RENOVATING OLD PASTURE

Project 103.—Throughout the Eastern Townships are large areas which are too rough for cultivation, but which have been used for pasturing stock ever since the forest was cleared off them. Usually very little attention was paid to keeping up their fertility, so that to-day they are, in many cases, growing up under weeds and scrub timber. The following experiments are an effort to find out the cheapest way to bring such land back into a productive condition. Three acres of back pasture were cleared of stumps and treated in the manner described in the following experiments.

1. *Experiment with Various Cultural Treatments.*

   (*a*) One eighth of each seeding has been ploughed and disced.

   (*b*) One-quarter of each seeding has been disced only.

   (*c*) The remainder of the seeding received no cultivation whatsoever.

2. *Experiment with Different Dates of Seeding.*

   (*a*) One-third was seeded in September.

   (*b*) One-third will be seeded as soon as the snow goes off the ground in the spring.

   (*c*) One-third will be seeded in June.

3. *Experiment with Basic Slag.*

(*a*) One-half of each seeding, including all three cultural treatments, received an application of basic slag at the rate of 600 pounds per acre. The other half received no fertilizer.

4. *Experiment with Various Grass and Clover Seeds Planted all Together.*

The seeding mixture used in this experiment is made up as follows: Timothy, 4 pounds; alsike, 3 pounds; white Dutch clover, 2 pounds; red top, 3 pounds; white blossom sweet clover, 10 pounds; orchard grass, 5 pounds; Canada blue grass, 3 pounds. The rate of sowing is 20 pounds per acre, the best varieties to be determined by observation.

DRAINED VERSUS UNDRAINED LAND

Project 24.—This experiment is an attempt to ascertain what advantage there is in underdrained land that will give a fair yield with only natural drainage. Two fields, each over 20 acres in extent, and similar in soil and topography, have been set aside for this work. One field was under-drained in 1920, while the other has only natural drainage. A four-year rotation will be followed, and accurate records kept of costs and yields. The necessary manuring and fall ploughing have been completed for this year.

ROTATION EXPERIMENT

Project 104.—This experiment is a comparison of different rotation systems. Three-year, four-year, five-year and six-year rotations are to be tested side by side in an 18-acre field, and accurate records kept of costs and yields. The necessary fall work has also been completed for this experiment.

FERTILIZER AND CULTURAL EXPERIMENTS ON PLOTS

During the summer of 1921, a field 28 acres in extent was summer-fallowed as a preparation for plot work with fertilizers and cultural tests. Nearly half of this field will be divided off into twentieth-acre plots next summer, while the remainder will be under corn. The following is a list of the experiments which will be carried on in this field:—

Project 105.—FERTILIZER EXPERIMENTS.

1. Reducing manure to 10 tons per acre for corn.
2. The use of lime.
3. Fertilizing hay.
4. Fertilizer for potatoes.
5. Green manures.

Project 106.—CULTURAL EXPERIMENTS.

1. Preparing sod land for corn.
2. Depth of ploughing.
3. Seeding grass seed.
4. Preparing sod land for grain.

HORTICULTURE

SEASONAL REMARKS

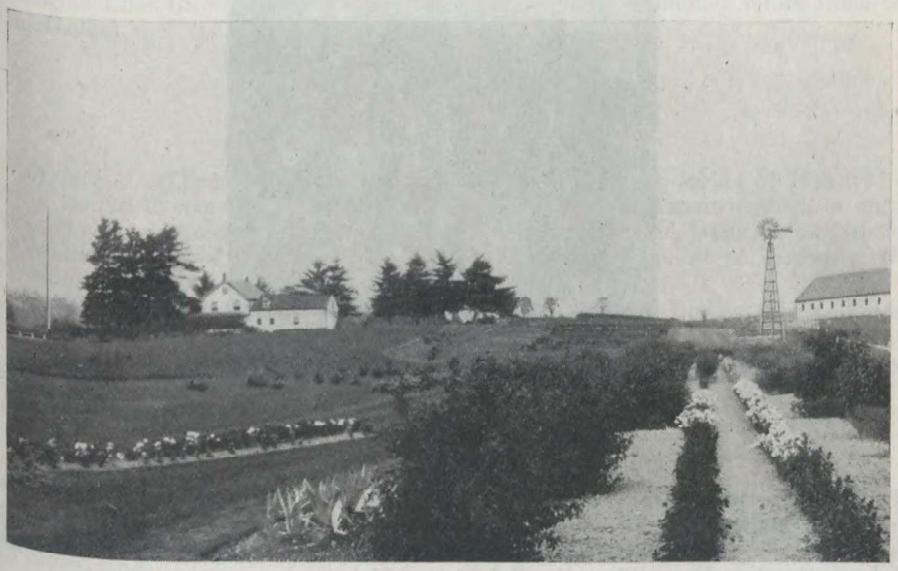
After the remarkably mild winter of 1920-21, the spring opened early with every prospect for a fruitful year. The frost was out of the ground sufficiently by March 28 to permit digging. The unusually warm weather of April forced the fruit trees along rapidly, so that the plum trees began to bloom April 29. The crab apple trees began to bloom May 7.

The first seeds were sown in the garden May 2, including peas, onions, beets and parsnips. The strawberries began to bloom May 8, but frosts which occurred during this part of the month destroyed all of the early bloom. Between frost and dry weather the crop was very small. Red raspberries and black currants were practically a failure, the fruit dried up with the intense heat, but red currants and gooseberries did very well.

The vegetable garden was up to the average and, in many respects, surpassed the gardens of former years. Such crops as corn, melons, tomatoes, celery and potatoes were extraordinary. The value of frequent and thorough tillage was well brought out this season, with regard to the conservation of soil moisture.

It should be added here that from June 16 until September 26 no frost occurred but the night of September 27 a severe frost cut off all tender crops.

Plant diseases were not troublesome in the garden. Potato or celery blight was not in evidence anywhere.



Ornamental Grounds, Lennoxville.
Bare spots can be made beauty spots. Perennial phlox in bloom between shrubs.

ORNAMENTALS

ANNUALS

Project No. 108.—Seventy-one varieties and strains were tested in 1921.

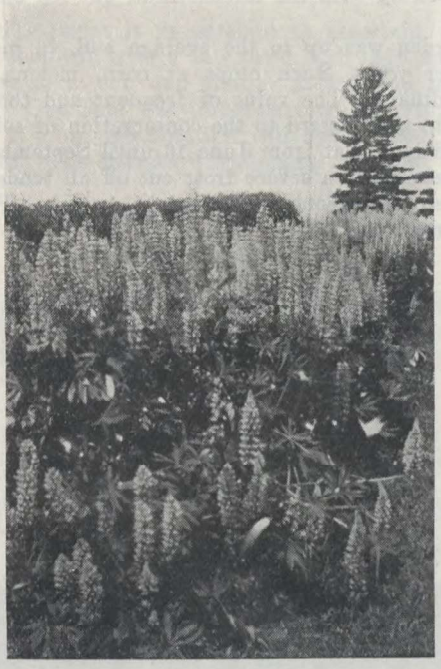
Annual flowers are very necessary in completing the display of bloom in ornamental grounds whether large or small. The following have been very satisfactory:

Aster, Antirrhinum, Browallia elata, Cosmea, Lavatera, Linaria, Lobelia, Nasturtium dwarf, Petunia, Phlox Drummondii, Portulaca, Salpiglossis, Sweet Peas, Verbena, Zinnia. Gladioli are an indispensable part of a collection.

It has been found that home-grown seed gives very satisfactory results, and, where possible, seed of the various sorts should be saved.

PERENNIALS

Project 109.—A very great variety of perennials has been tested at this Station during the past six years. The work was commenced in a limited way and gradually broadened out more extensively. Those varieties which may be considered as



Hardy Perennial
Lupinus polyphyllus

of most importance are: Pæonies, Iris Incarvillea, Pyrethrum, Phlox in variety, Aquilegia, Gaillardia, Chrysanthemum maximum, Garden Pinks, Sweet William, Baby's Breath *(Gypsophila paniculata)*, Lychnis, Sweet Rocket, Oriental Poppies, Iceland Poppies, Erect Clematis, Delphinum Hybridum and D. Chinense.

SHRUBS

Project 110.—Deciduous flowering and ornamental shrubs have been under test, but many of the finest species have proved too tender for the severe conditions at this Station. The ones which have proved most suitable are as follows:—

Shad Bush, Japanese Barberry, Common Barberry, Purple Barberry, Dogwood, Japanese Quince (tender), Greenwood *(Genista tinctoria)*, Hydrangea *(paniculata grandiflora)*, and *(arborescens)* Honeysuckle (Tartarian), and Japanese Bush Honeysuckle, Large-flowered Syringa (*Philadelphus grandiflorus*), Japanese Rose

Bush Honeysuckle
(*Lonicera (Chamaecerasus) Morrowi*)

(Rosa rugosa) Snow Garland and *Spirea arguta*, Hungarian Lilac *(Syringa Josikœa)*, Himalayan Lilac (*S. villosa*), Common Lilac (*S. vulgaris*), Common White Lilac (*S. vulgaris alba*).

TREE FRUITS

CULTURAL APPLE ORCHARD

Project 48.—The above-mentioned orchard was planted the spring of 1915 with a view of testing 18 commercial varieties of apple trees. (1) Different methods of cultivation, (2) replenishment of soil fertility by various methods, and, lastly, suitability for the locality. None of the trees fruited, but from the standpoint of hardiness, the following list is given in order of merit:—

Lowland Raspberry, Crimson Beauty, Langford Beauty, Dudley, Scott Winter and Duchess.

NOTE.—Out of the 869 trees planted in 1915, 577 trees were replaced during the five years this orchard was in existence.

The experiment has been discontinued.

VARIETY APPLE ORCHARD

Project 49.—Many of the trees blossomed this spring, but, owing to several quite severe frosts during the nights when the trees were in bloom, there was no crop of any consequence.

The trees having wintered well, made fairly strong growth and are in very fine condition for another year, should the winter not be too severe.

There are 540 trees in this orchard.

PLUM ORCHARD

Project 56.—The orchard here is made up mainly of seedlings from many sources, but also comprises such varieties as Waneta O-2796, Hawkeye, Omaha, Weaver and Cheney. There are in all 168 trees. Of these varieties, Waneta is the

most outstanding, being hardy and a very good cropper, with fruit of very large size and good quality. However, Hawkeye and Omaha are worthy of notice, the former being considered much better than the latter. The seedling varieties are full of promise for canning purposes.

PEARS

Project 54.—This class of fruit trees has not thrived here until this season and there does not seem a possibility of any success in this direction. Five winters out of six these trees have been severely injured.

CHERRIES

Project 50.—The trees planted in 1915 have not made any progress. The past spring, a small amount of bloom developed, but no fruit set. This is a class of fruit that, for the present, will have to be discarded, due to its lack of hardiness.

SMALL FRUITS

RED RASPBERRIES

Project 57.—Until further planting of other varieties is carried out, there is nothing left to do but place the varieties which are now under test in order of hardiness and productiveness: King, Brighton, Eaton, Count and Herbert.

It should be added here that, while the King variety is acknowledged to develop large numbers of suckers, yet it has been found very hardy, and, when kept well thinned out, is very productive.

The raspberry crop was a failure this season, due to the prolonged drought.

BLACK CURRANTS

Project 51.—(Twelve varieties under test.) Variety tests conducted over five years show that the following varieties are the most outstanding: Saunders, Kerry and Climax. The first mentioned variety has been very productive, yielding on an average of five years, 2,966 pounds per acre.

RED CURRANTS

Project 52.—(Twelve varieties under test.) A comparison of the results obtained in the variety test, over six years, shows that Red Grape and Victoria are the two most outstanding varieties, and, of the two, Red Grape is the more productive, yielding an average of 2,997 pounds per acre.

WHITE CURRANTS

Project 52a.—(Three varieties under test.) Six years' test has shown that White Cherry is the most productive and thrifty variety. The average yield for the six years is 804 pounds per acre.

GOOSEBERRIES

Project 53.—(Eight varieties under test.) Six years' test of the various varieties has proved that the most satisfactory varieties are: Houghton, Carrie, Downing and Whitesmith. Houghton leads in yielding ability with an average of 1,106 pounds per acre; Carrie, 885 pounds per acre; Downing, 561 pounds per acre and Whitesmith with 531 pounds per acre. Houghton, though yielding small-sized fruit, possesses hardiness and is a good grower.

GRAPES

Project 111.—A variety and strain test has been conducted during six years, and from the results obtained, the prospects for grapes in this locality are decidedly poor. There has not been a season yet when frost injury was escaped, either in the spring or early fall.

Moore Early, Wilkins and McTavish are the only varieties that have produced any reasonable amount of fruit that nearly matured on the vines. This season being quite long between frosts, with extremely hot weather, fruit ripened thoroughly on the above varieties.

STRAWBERRIES

Project 58.—This Station started a test of thirty-six varieties six years ago. Twelve varieties were discarded during the course of time for lack of productiveness and vigour, and susceptibility to leaf spot. Of the twenty-four varieties retained, the following have proved most satisfactory: Senator Dunlap (per.), 7,038 pounds per acre as an average for five years. Buster, (imp.), 7,161 pounds per acre. Parsons Beauty (per.), 4,104 pounds per acre. The foregoing three varieties are outstanding in quality with yield combined. There are others which have given higher yields but the quality was inferior.

Seedling varieties, Valeria, (per.), 5,597 pounds per acre as a five-year average. Portia (imp.), 4, 209 pounds per acre as a five-year average. Others are under test giving larger yields per acre, but the quality in general is poorer.

VEGETABLES

Project 61.—Beets.—Nine varieties were tested in rows 30 feet long and 30 inches apart. Sowing was done May 2. Ready for use July 12. Two varieties were particularly outstanding as to quality and yield.

Crosby Egyptian, possessed more quality than any in the test, was very uniform and free from coarse necks and prongs; yielded 72 pounds.

Detroit Dark Red, was lacking in uniformity somewhat, and quality slightly inferior to the former, gave a yield of 103 pounds. This has been considered our leading beet for some time past. It is an excellent variety for bunching for early market.

Project 65.—Carrots.—Five varieties were sown in rows 30 feet long and 30 inches apart. Sowing was done May 2. Ready for use August 3.

The trueness to type of the various varieties and strains is open to criticism, as will be noted in the accompanying illustration.

Oxheart and Chantenay were the most outstanding.

Project 71.—Lettuce.—Nine varieties were under test in rows 15 feet long and 15 inches apart. Seed was sown May 2.

Grand Rapids O-232 was very good, being ready for use June 6.

Iceberg (cabbage), although not the earliest of this sort, was the best.

Project 87.—Radish.—Five varieties and strains were tested in rows 15 feet long and 15 inches apart. Seed was sown May 2. Ready for use June 10. Two varieties were particularly outstanding.

XXX Scarlet Oval is of the finest quality that could be desired in a radish.

Improved French Breakfast is a close second for quality.

Project 59.—Beans.—Seven varieties of string beans were sown May 30 in drills 30 feet long and 30 inches apart.

Davis White Wax was the earliest, being ready for use July 25, yielding in three pickings 32 pounds. The quality was very good.

Hodson Long Pod is a very fine variety for the late crop, and is particularly attractive, being free from disease.

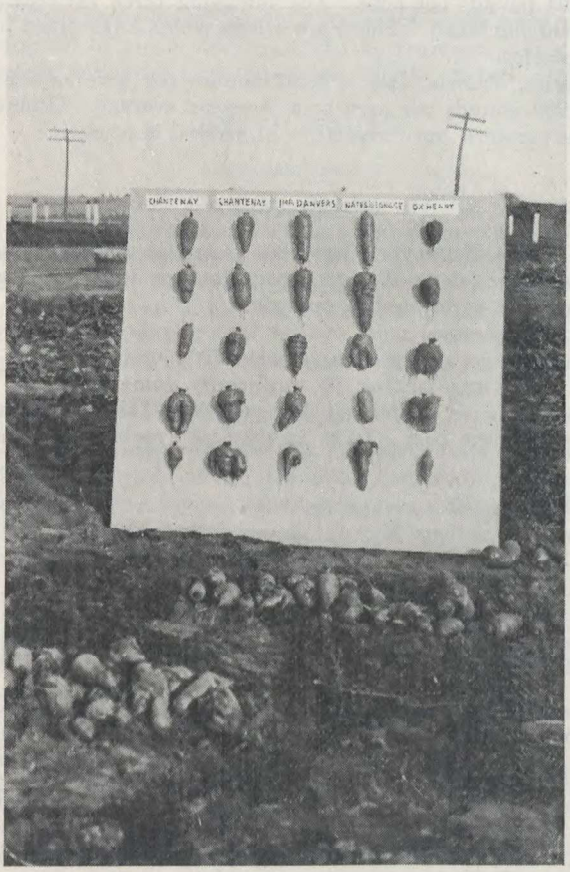
Bountiful Bush is the earliest and best cropper of the green pod varieties here; was ready for use July 29, yielding 26 pounds.

Extra Early Valentine possessed good quality, but yielded a smaller crop.

Project 79.—Garden Peas.—Eight varieties of dwarf and five varieties of tall peas were sown May 2, in rows 30 feet long and 30 inches apart.

Eight Weeks (dwarf) was ready for use June 30 and yielded 12 pounds; quality good. Little Marvel was ready for use July 3, yielding 12 pounds; quality good. Gradus and Reliance (tall) both yielded 11 pounds per row and were of good quality; if anything, Gradus was superior.

Project 65.—Cucumbers.—Four varieties were tested in three hills of each variety, planted 6 by 6 feet apart, with three plants per hill. Planting was carried out June 13 and 14.



Carrots—Notice lack of uniformity and smoothness.

Davis Perfect is one of the best varieties for this locality, with Improved Long Green as a close second.

For early fruit, Early Russian is an exceedingly good sort. The fruit is small but abundant, and of very good quality.

Project 81.—Peppers.—Three varieties of tested plants were started in the hot-bed March 29. They were planted in the garden June 9, in rows 30 feet long and 15 inches apart in the row, 24 plants of each variety.

Harris Earliest was the first to mature, being ready for use, ripe, July 12, and yielded 7 pounds. This is the best pepper for this locality.

Chili, ready for use September 9, rather late; four pounds was the yield from 24 plants.

Project 88.—Salsify.—Salsify is a crop not grown to any extent here, but should be better known. One variety, Long White, was sown May 2 and produced a very good crop of 20 pounds.

Project 69.—Egg Plant.—New York Purple was grown. Seed was sown in the hot-bed March 29. Planting in the garden was done June 9. Had the season not been long and very hot there would not have been any crop.

Forty-eight plants yielded 46 pounds of very good fruit. The first fruit was ready for use September 19. It would be inadvisable to consider this a crop for this locality.

Project 74.—Onions.—Eleven varieties were sown in rows 30 feet long and 15 inches apart May 2.

Extra Early Flat Red has proved to be the best early onion for this locality, and one which ripens well each season. It has been the leading onion here for six years.

Yellow Globe Danvers is a excellent main crop onion, and yields well.

White Barletta is a very good variety for pickling.

Project 63.—Brussels Sprouts.—Three varieties were tested, but the results from this class of vegetable do not warrant the labour.

Paris Market can be considered as the best with Dwarf Gem as a second choice.

Project 72.—Muskmelons.—An excellent crop was harvested this season. The plants were started in the hot-bed and transplanted to hills in the garden 6 by 6 feet apart and three plants per hill, on June 20.

Four varieties of small melons were tested, of which Emerald Gem was the best, yielding 58 pounds. The quality was excellent; flesh red. Paul Rose was a close second, with a yield of 54 pounds; red flesh; quality good.

Hackensack and Montreal Improved Market were grown. Both of these varieties did well. The former yielded 39 pounds, and the latter 99 pounds. One specimen from the latter weighed 12½ pounds; quality was very good.

Project 73.—Watermelons.—Three varieties were tested. The plants were started in the hot-bed and planted in the garden June 20, in hills 6 by 6 apart, with three plants per hill.

Ice Cream is a leader, yielding 120 pounds. The largest melon weighed 17 pounds.

Project 89.—Squash.—Eight varieties and strains were on test. Seed was sown in paper earth bands in the hot-bed, May 6 and the plants were transplanted to hills in the garden 9 by 9 feet apart with three plants per hill on June 13.

Summer Squash White Bush Scallop, yielded 47 pounds.

Green Hubbard, a very fine squash of excellent quality for winter use, yielded 215 pounds of fully ripened fruit.

Golden Hubbard is worthy of consideration as it is a first-class variety, although not as heavy a cropper.

Long White Bush Marrow is the most productive of the two varieties tested, yielding 103 pounds, and of good quality.

Project 86.—Pumpkins.—Four varieties were tested, being started and treated in a similar manner to squash.

Sweet or sugar is the leader as regards quality, and yielding 142 pounds. It is very fine for pies or as a table vegetable.

Connecticut Field is the best of the large varieties. It is very prolific, yielding 249 pounds.

Project 67.—Sweet Corn.—Fifteen varieties were tested. Twenty hills of each variety were planted May 27, 3 by 3 feet apart. The records were taken on twelve average hills. Four stalks were allowed to remain in each hill, and all shoots were removed.

Extra Early.—Pickaninny, ready for use August 5; yielded 49 ears.

Early.—Early Malcolm, ready for use August 12; yielded 80 ears.

Late.—Golden Bantam, ready for use August 27; yielded 96 ears; Golden Giant, ready for use August 29; yielded 70 ears.

Project 90.—Tomatoes.—Since the inauguration of this Farm, there has not been as good a season for the tomato crop as the one just past. Seventeen varieties were on test. The seed was sown March 28. Planting was commenced in the garden June 10. The nights of June 16, 17 and 18 almost registered frost, but hot weather followed and continued until September 27, when frost injured the vines.

The best varieties for this locality are old standards: Bonny Best, with a yield from five plants of 31 pounds. Chalks Jewel, with a yield from five plants of 32 pounds.

While Bonny Best did not yield as much as Chalks Jewel, yet the quality possessed by the former gives it first place.

All varieties were trained to one stem on stakes. The stakes were planted in rows 4 feet apart and 2 feet apart in the rows.

Project 112.—Cabbage.—Sixteen varieties were sown April 11 and 12. Planting in the garden was done June 7 to 10, in rows 36 inches apart with the plants 18 inches apart in the rows. The dry, hot weather which followed was very hard on the plants.

The best early variety is, without doubt, Copenhagen Market, and used for crops in succession is very satisfactory. The heads are round. The weight of five average heads was 63 pounds. The foregoing weight of the variety was taken as a late fall crop.

For late cabbage and for storage, there is no variety better than Ex. Amager Danish Ballhead. The heads are not large, but remarkable for their solidity and weight.

Danish Delicatesse (red) is the best of the reds.

Project 113.—Celery.—Eleven varieties were sown in the hot-bed March 29. All varieties were planted in the garden between June 20 and 24. Shallow trenches 7 inches deep were opened, and the plants set 6 inches apart in the rows. As the plants developed, the trenches were gradually filled; August 15 the rows were banked up with earth, which operation was repeated at intervals of ten days until harvesting, October 26.

The best early varieties are: From the quality standpoint, White Plume is easily first, but the size of stalk is very much against the variety. Golden Self Blanching may be considered the standard for market purposes. Five heads of the former weighed 4 pounds, while five heads of the latter weighed 7 pounds.

The late varieties did well; Evans Triumph was first and French Success second.

Project 114.—Parsnips.—Two varieties were on test. The seed was sown May 2 and May 30 respectively. It has been found that Hollow Crown is the best all-round variety to grow.

Project 115.—Turnips.—One variety was tested this year. The seed was sown May 2, ready for use July 6.

Early Snowball has been a good variety here and possesses very high quality.

Project 116.—Herbs.—Winter sage did poorly this year. Summer savory did very well.

The seed was sown in the garden May 2.

Project 117.—Spinach.—One variety, New Zealand, was tested. The quality of this as greens is in many respects superior to the ordinary spinach. Its habit of growth renders the plant decidedly free from soiling and consequent waste when being prepared for use.

The seed was sown May 2. The crop was ready for use July 12.

Project 118.—Potatoes.—There is no doubt but that the potato crop is an important one, consequently the very best varieties that can be found should be used.

Irish Cobbler for the early crop has been found to be the most profitable to grow, and Green Mountain for the main crop.

Project 119.—Control of Potato Beetles.—During the past two years, an experiment has been conducted with a view to ascertaining which kind of insecticide, in combination with Bordeaux mixture, would give the most protection to the potato crop.

From results obtained from the use of five different commercial preparations, it was found that calcium arsenate gave quicker and more complete killing than any of the other four preparations, and without any injury to the plants. The calcium arsenate was used at the rate of 1½ pounds to 40 gallons of Bordeaux mixture. Calcium arsenate is the cheapest preparation procurable and the crop from the plot treated with it was much larger than the others.

Dry lead arsenate is a close rival, but this material is more expensive than the former.

Project 120.—Late Sown Beets.—Dark red beets, seed sown July 11, were found to have developed a good crop of first quality, smooth roots by October 18, when they were harvested. One row 30 feet long yielded 33 pounds.

Project 121.—Late Sown Carrots.—Improved Danvers Half Long, sown July 11, developed a very nice crop of smooth, good-quality roots by October 18, when they were pulled. One row 30 feet long yielded 23·5 pounds.

CULTURAL EXPERIMENTS

Project 75.—Distance of Thinning Onions.—Where onions are to be grown for a fall crop, it has been found that thinning to 3 inches apart gives much better results than where they are left closer or farther apart.

Project 64.—Control of Cabbage Root Maggot.—The most effective method of control for cabbage root maggot is by the use of tar felt collars, placed around the stem of the plant and pressed close to the ground, care being taken not to allow earth on the top of the collar.

Project 91.—Training Tomatoes.—During the six years in which this experiment has been under way, it has not been possible to see any difference as to the effect on the yielding ability of the plants, which any certain plant support might have. Both stakes and wire trellis have been used. Stakes have proved most satisfactory with little cost and trouble to put in place.

Plants trained to one stem yield earlier, but give smaller crops than where trained to two stems.

Two varieties were used: Bonny Best and Alacrity O-704.

Fifty plants Bonny Best, one stem on stakes, yielded 298 pounds ripe fruit.

Fifty plants, Alacrity O-704, one stem on stakes, yielded 257 pounds ripe fruit.

Fifty plants, Bonny Best, two stems on stakes, yielded 361 pounds ripe fruit.

Fifty plants, Alacrity O-704, two stems on stakes, yielded 308 pounds ripe fruit.

Fifty plants, Bonny Best, two stems on wire trellis, yielded 347 pounds ripe fruit.

Fifty plants, Alacrity O-704, two stems on wire trellis, yielded 313 pounds ripe fruit.

Fifty plants, Bonny Best, one stem on wire trellis, yielded 257 pounds ripe fruit.

Fifty plants, Alacrity O-704, one stem on wire trellis, yielded 221 pounds ripe fruit.

Bonny Best showed more vigour than Alacrity. Two stems gave the largest amount of fruit.

Tomatoes—A Good Crop. Two stems on wire trellis. Note the vigour of Bonny Best in foreground. Alacrity in background.

Project 82.—Potatoes—Size of Sets.—Different kinds of sets, whole small potatoes under two inches in diameter, and sets cut to one, two and three eyes from medium-sized potatoes, 66 of each kind of set, were planted. The yields were as follows:—

Whole small potatoes yielded 98 pounds marketable tubers; one eye yielded 82 pounds; two eyes yielded 123·5 pounds, and three eyes yielded 101 pounds. It has been noticeable during the six years that two eyes yield more large potatoes in proportion to small ones than did any of the others.

Project 83—Distance Apart for Planting Potatoes.—Where potatoes are planted too closely, there is a liability of a very large percentage of small tubers;

18 by 36 inches has given the best results, and for all practical purposes can be recommended.

Project 62.—Distance of Thinning Beets.—During six years past, this experiment has been under way. Thinning the plants to 2, 3 and 4 inches apart respectively has brought out the fact that at 2 inches apart the plants are too cramped, but at 4 inches apart very fine roots form, and possess good quality.

One row 30 feet long yielded 63 pounds.

Potatoes—Kind and Size of Sets. Variety, Green Mountain.
No. 1. Whole small potato sets. No. 2. Sets cut to three eyes.
No. 3. Sets cut to two eyes. No. 4. Sets cut to one eye.

Project 66.—Distance of Thinning Carrots.—Thinning has been carried out with this crop to similar distances to the foregoing beets.

When thinned to 4 inches the crop develops very uniformly, and gives a good yield. One row 30 feet long yielded 44 pounds.

Project 80.—Successive Sowings of Peas.—Very satisfactory results can be obtained by making weekly sowings of one early variety of peas. It has been found that Thomas Laxton sown in succession, at intervals of a week, will furnish fresh tender peas as required. Four or five sowings can be made.

Project 60.—Successive Sowings of Beans.—This experiment is in every way similar to the former, and has been found satisfactory.

An early variety of beans was used. The one found most satisfactory for this purpose is Round Pod Kidney Wax.

Project 78.—Thinning Parsnips.—From experience during the past six years it has been found that 4 inches apart between plants in the rows yields the best crop of parsnips. One row 30 feet long yielded 20 pounds.

Project 75.—Transplanting Onions.—The plants are started in the hot-bed for this experiment. Planting at three distances apart in the rows, respectively 2, 3 and 4 inches, has been tried.

For transplanted onions, 2 to 3 inches apart has given the best results.

Project 122.—Method of Blanching Celery.—Golden Self Blanching has been used. Three methods are employed: pliable roofing material, boards, and earthing up.

Pliable material and boards give earliness combined with stringiness and poor quality, while earthing up takes longer to complete the process, yet the quality of the product and size of the stalks more than warrant the labour.

The weight of five average stalks from each is as follows:—pliable material, 3 pounds; boards, 3 pounds; earthing up, 7 pounds.

FORAGE CROPS

THE SEASON

The season of 1921 was the driest experienced in this part of the country for a number of years. The rainfall for April was 2.09 inches and for May only 0.84 inch.

Frosts the latter part of May and the first of June damaged corn. Roots failed to germinate evenly and were resown. However, once they got started, nearly all varieties of forage crops under test made good progress, considering the dryness of the season. Corn especially made excellent progress during the latter part of August and September, there being no frost to do any damage. There was no damage done to roots by cut worms or club root.

THE SOIL

The soil in which the forage crops were grown is a sandy loam. Manure at the rate of sixteen tons per acre was applied in the fall and ploughed in. The land was ploughed again in the spring and the portion set aside for roots drilled. Commercial fertilizer, made up of 100 pounds nitrate of soda and 200 pounds superphosphate, was applied to the root ground at the rate of 300 pounds per acre.

Sunflowers outgrew corn on this field. Note the large leaves carried down to the ground.

VARIETY TESTS WITH INDIAN CORN FOR ENSILAGE

Project 26.—Ten varieties of corn were tested in uniform duplicate plots. For comparison, plots of Giant Russian sunflowers were included in these tests. Planting was done on May 21 and harvesting on October 5. The results are given in the following table:—

Variety	Date of Tasseling	Height in Inches	Stage of Maturity	Yield per Acre	
				Tons.	Pounds
Compton's Early	Aug. 1	93	Dough	23	1,589·3
Salzer's North Dakota	Aug. 1	100	Milk	19	250·9
Longfellow	July 21	84	Dough	17	607·4
Bailey	Aug. 4	108	Far	15	588·3
Wisconsin No. 7	July 31	96	Milk	14	422·5
Twitchell's Pride	July 18	85	Dough	12	1,523·3
Quebec No. 28	July 18	72	Dough	12	883·6
White Cap Yellow Dent	July 31	96	Milk	11	1,250·1
Leaming	Aug. 1	108	Dough	11	977·8
Canada Yellow	July 22	78	Dough	11	174·8
Average Yield	.....	.....	.....	14	1,826·8
Sunflowers—Mammoth Russian	.....	.....	.....	22	443·4

VARIETY TEST WITH SWEDES

Project 33.—Seventeen varieties of swedes were tested in uniform duplicate plots next to the corn. They were sown on May 17 but, owing to the dry weather, did not germinate well and were resown on June 9. Shortly after resowing it rained and both sowings came up. From then on they did fairly well, but were not so uniform as they might have been if the weather had been more favourable. There was no trouble from cutworms or club root. They were harvested on October 19.

SWEDES—TEST OF VARIETIES

Variety	Source of Seed	Yield per Acre				Remarks
		Tons	Pounds	Bush.	Pounds	
Kangaroo	Dupuy & Ferguson....	28	410	940	10	Rough, true to colour.
Ditmars	.....	26	1,056	884	16	Rough, pronged.
Monarch	Nappan.....	25	1,575	859	35	Pronged, long neck.
Hall's Westbury	Ewing.....	25	878	847	58	True to type.
Purple Top	.....	24	1,876	831	16	True to type.
Irish King	Ewing.....	24	395	806	35	Rough necks.
Perfect Model	Dupuy & Ferguson....	23	1,874	797	54	Rough.
Improved Westbury	Dupuy & Ferguson....	22	736	745	36	True to type.
Sutton's Champion	.....	22	170	736	10	Rough, many types.
Hartley's Bronze Top	Rennie.....	21	1,517	725	17	Many types.
New Century	Rennie.....	21	1,471	724	31	Long necks, many types.
Halewood's Green Top	Ewing.....	21	602	710	2	Lacked uniformity.
Purple Top	Ottawa.....	21	384	706	24	True to type.
Perfection	Dupuy & Ferguson.	20	946	682	26	True to type.
Mammoth Clyde Purple Top	Ewing.....	20	554	675	54	Lacked uniformity in size, shape and colour.
Best of All	.....	20	511	675	11	Lacked uniformity, long necks.
Invicta Bronze Top	Rennie.....	17	1,893	598	13	Mixed types.
Average	.....	22	1,697	701	37	

VARIETY TEST WITH MANGELS

Project 32.—Fourteen varieties of mangels and sugar beets were tested in uniform duplicate plots under the same conditions of soil and fertility as the swedes. They were sown on May 19 but did not germinate uniformly so were resown on June 9. Owing to unfavourable weather conditions, there was a lack of uniformity of shape and size in nearly all the varieties. They were harvested October 20 and 21.

MANGELS—TEST OF VARIETIES

Variety	Source of Seed	Yield per Acre				Remarks
		Tons	Pounds	Bush.	Pounds	
Red Globe	Ewing	20	1,818	696	58	Lacked uniformity in shape.
Giant Half Long-S. Beet	Dupuy & Ferguson	20	249	670	49	Uniform in shape and colour.
Giant White Half Long Sugar Beet	Ewing	19	1,553	659	13	Off type in shape, colour good.
Giant Yellow Globe	Ewing	18	68	601	8	Off type in shape, colour good.
Golden Tankard	Ewing	17	1,371	589	31	Off type in shape, colour good.
Improved Tankard Cream	Rennie	17	674	577	54	Off type in shape, colour good.
Best of All	Dupuy & Ferguson	16	1,803	563	23	Mixed types.
Mammoth Long Red	Dupuy & Ferguson	15	1,755	529	15	Various shapes, colour good.
Giant Yellow Half Long	Rennie	15	1,015	516	55	Prongy, off type.
Jumbo S. Beet	Rennie	15	187	503	7	Prongy, off type.
Red Globe	Dupuy & Ferguson	14	1,529	492	9	Mixed types.
Prize Winning Strain	Dupuy & Ferguson	14	1,403	490	3	Small, off type.
Selected Mammoth Long Red	Rennie	12	481	408	1	Small.
Yellow Intermediate		9	1,079	317	59	
Average		16	642	544	2	

VARIETY TEST WITH SUGAR BEETS

Project 31.—Four varieties of sugar beets were grown in uniform duplicate plots under exactly the same conditions as the swedes and mangels. They were sown on May 19 and harvested October 20.

Variety	Yield per Acre			
	Tons	Pounds	Bush.	Pounds
Chatham (Dominion Sugar Co.)	11	913	381	53
Klein Wanzleben (Rimpau)	10	1,432	357	12
British Columbia (Dominion Sugar Co.)	10	734	345	34
Waterloo (Dominion Sugar Co.)	8	422	273	42
Average	10	375	339	35

VARIETY TEST WITH FIELD CARROTS

Project 29.—Seven varieties of field carrots were tested in uniform duplicate plots. They received the same care as the other root crops, but the soil on which they were grown was more sandy so that they suffered more from drought. Mammoth Short White, Improved Intermediate White and Danish Champion gave the best yields.

TEST OF WHITE BLOSSOM SWEET CLOVER

Projects 40 and 43.—White Blossom sweet clover was tested in plots in a field which was underdrained the year before, but winter-killed to such an extent that it was necessary to reseed. Resown to timothy and sweet clover, a good catch was

obtained which, owing to the necessity of using this land for drainage experiments, was ploughed under.

TEST OF PERENNIAL CLOVER

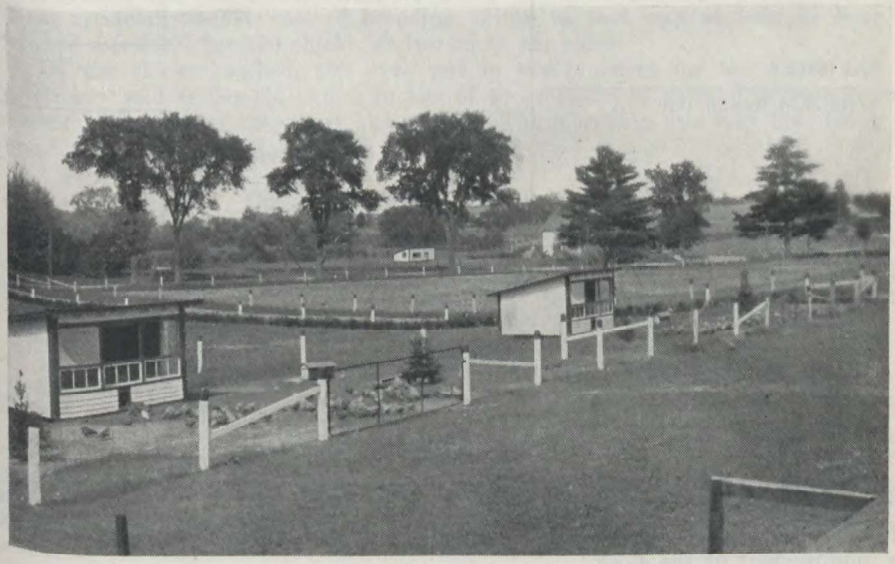
Project 41.—A small area was seeded down to a selection of red clover which, at Ottawa has shown strong perennial tendency. A good stand was established and from the appearance of the plots there is every prospect of this variety proving successful.

POULTRY HUSBANDRY

The season of 1921 was very favourable for poultry work, especially during the winter and spring months. The winter months were mild, which helped to increase winter egg production, while the spring was early and pleasant for brooding the young stock. The summer months, however, were exceptionally hot and dry, which seemed to mature the young stock before their full development had been attained.

BUILDINGS

The buildings occupied by the Poultry Division consist of an administration building, two straw-loft type laying houses, and five movable, shed-roof colony houses. The administration building contains an office for all record work, storage rooms, and basement equipped with incubator and egg rooms. The two laying houses



Colony Houses on the Range.

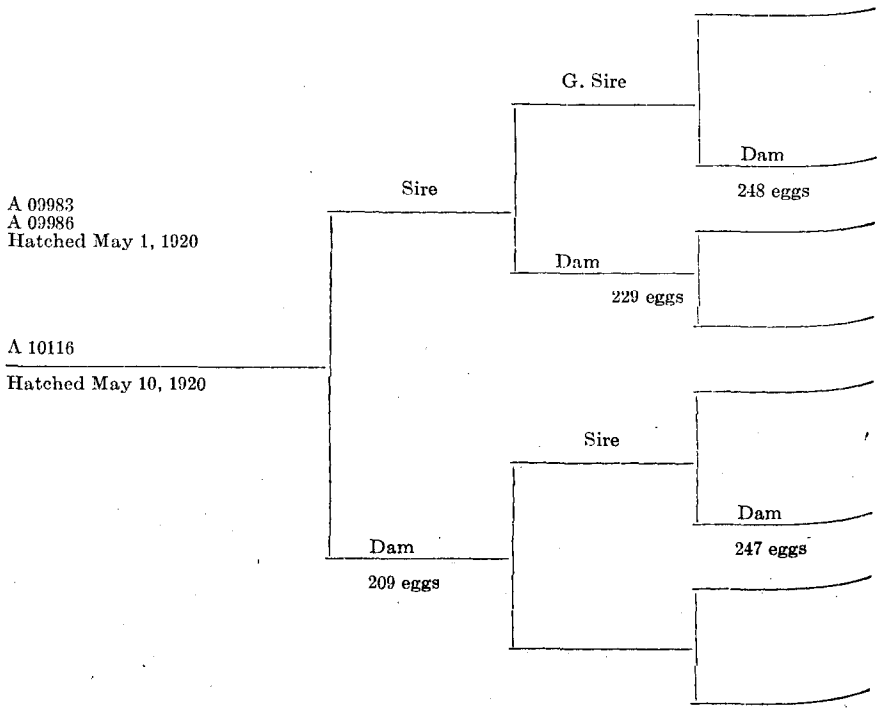
are 16 by 32 feet each in size and each house is divided into two pens. These houses are used to house 200 pullets each fall for the purpose of experimental work in feeding and trapnesting to build up a heavy winter-egg-producing flock and to secure data on cost of feeding, cost of production, average profits, etc. The five colony houses are 10 by 12 in size; they serve a double purpose being used each spring with a brooder stove for brooding chicks, housing them on range during the summer months, and also being used to house those adult females, during the winter months, which have made the best records during their pullet year and are being held as breeders for the following spring.

STOCK

Up to the present, only Barred Plymouth Rocks have been kept, they being considered a popular and suitable breed for this climate. All females are trapnested until sold or marketed, and only the individuals making favourable records are used for breeding purposes.

There were on hand at the beginning of the year 1921—195 pullets, 58 yearling hens and 12 cockerels. The yearling hens, 7 of which had made records of over 200 eggs each in their pullet year, were divided in three pens on February 15 for breeding purposes, and were mated to three full brothers from a 209-egg hen with a sire's dam record of 229 eggs.

Below is shown the pedigree of the cockerels used in pens A, B and C.



The eggs used for hatching from these pens gave an average per cent fertility of 95.1 for the season and the hatchability averaged 58.9 of very strong, healthy chicks. All chicks hatched from these pens were pedigree banded and reared on the Farm for the improvement of the stock.

About 30 of the 195 pullets, birds that had not been even fair winter egg producers and were not paying for their feed were culled out on the 1st of March, three of those had not a single egg to their credit at that time. The remaining pullets were mated to cockerels from dams of high production, and the eggs hatched to supply the increasing demand for day-old chicks. The practice of selling a limited number of day-old chicks in preference to eggs for hatching has been followed at this Station, and is meeting with approval throughout the Province. The fertility of the eggs from the pullet pens was not as high as from the yearling hens, averaging 86·9 per cent fertile for the season. The following table will show the hatching results and the differences between hens and pullets.

Project 123.—FERTILITY OF EGGS—HENS VS. PULLETS.

—	No. Eggs Set	No. Eggs Fertile	Per cent Fertile	No. Chicks Hatched	Per cent Fertile Eggs Hatched	Total Eggs Required for One Chick
Hens	1,596	1,518	95·1	895	58·9	1·7
Pullets	2,110	1,835	86·9	992	54·0	2·1

NOTE.—Fewer weak or crippled chicks were hatched from the hen than from the pullet pens.

INCUBATION

The eggs were all incubated artificially in a 2,440-egg Buckeye machine, installed in the basement of the administration building. To determine the cost of incubating in that way, an account was kept of the kerosene required to heat the machine, and also of the electricity required to drive the fans for the forced distribution of the heated air in the egg chambers. The average cost was 55 cents per 100 eggs, or slightly over one cent per chick hatched.

BROODING

The brooding was done by four coal-burning Standard brooder stoves which were used in the colony houses, and proved a most satisfactory means of brooding chicks artificially. The cost of brooding chicks in that way as long as heat was required was $2.00 per 100 chicks, or two cents per chick.

Of the chicks hatched, 800 were put in the brooders for the Farm and the remainder sold as day-old chicks in lots of 50 or fewer, so as to distribute stock to as great a number of customers as possible. The mortality was very low, being less than 8 per cent on all chicks put in the brooders.

COSTS OF FEEDING AND OF PRODUCTION

Project 95.—In order to get reliable information on the costs of rearing pullets to laying age, an account of all feed used by chicks each month is charged at the prices paid for the feeds as bought. These costs will vary according to feed prices prevailing. The following table will show the difference between 1920 and 1921.

FEED COST OF REARING PULLETS TO A LAYING AGE

—	April	May	June	July	Aug.	Sept.	Oct.	Total
1920	02½	06½	07	13½	17½	20½	27½	·94½ cents
1921	01½	05½	07¾	12½	15½	15	16½	·74½ cents.

NOTE.—A few of the pullets were laying during October, 1921.

FEEDING

The method of feeding in the breeding pens was, scratch grain each morning in a heavy litter, and again in the early afternoon more liberally. A dry mash was kept in self-feeding hoppers before the birds at all times, and a very small quantity of the same mash moistened slightly at noon and fed in troughs. Mangels or sugar beets were used for green feed and grit and oyster shells were kept in hoppers before the birds. A very satisfactory scratch grain for pullet feeding during the winter

months is 2 parts cracked corn, 1 part wheat and 1 part plump oats, if available. During the summer months equal parts cracked corn, wheat and oats should be used. For a home-mixed dry mash, 200 pounds bran, 100 pounds middlings, 100 pounds cornmeal, 100 pounds finely ground oats, 60 pounds fine beef scraps, and 25 pounds of charcoal have given very good results.

The experiments on costs of feeding, costs of production, etc., are dated from November 1 to April 30 on both pullets and yearling hens, and the following table will show the various costs during each month, and the difference in profits over feed between pullets and yearling hens.

Feed, Cost of Producing Eggs and Average Profit over Feed, Pullets Hatched and Reared in 1920

Month	No.	Cost of feed	Eggs laid	Price sold	Total value	Profit	Cost of feed		Profit per bird	Per bird	Cost per dozen eggs	Per cent production
							Loss	Eggs per bird				
		$ cts.		cts.	$ cts.	$ cts.	$ cts.		cts.	cts.	$ cts.	
Nov., 1920	200	56 05	556	0·85	39 38	.....	16 67	2·78	8·33	28·00	1 21·75	9·26
Dec., 1920	199	55 17	2,925	0·90	220 88	165 71	.....	14·69	83·27	27·72	22·50	47·38
Jan., 1921	195	47 46	3,623	0·75	226 43	178 97	.....	18·58	91·27	24·33	15·75	59·93
Feb., 1921	194	43 87	3,392	0·70	197 87	154 00	.....	17·48	79·89	22·66	15·50	62·42
Mar., 1921	164	31 60	3,198	0·58	154 57	122 97	.....	19·50	75·00	19·26	11·75	62·90
April, 1921	160	30 90	2,994	0·39	97 31	66 41	.....	18·71	41·50	19·31	12·50	62·38
May, 1921	158	29 52	2,859	0·35	83 39	53 87	.....	18·09	34·09	19·31	12·25	58·35
June, 1921	154	29 20	2,451	0·40	81 70	52 50	.....	15·78	34·09	19·00	14·00	52·60
July, 1921	154	25 65	1,773	0·40	59 10	32 45	.....	11·51	21·07	17·30	18·00	37·12
Aug., 1921	154	27 03	1,696	0·45	63 60	36 57	.....	11·01	23·68	17·55	19·00	35·51
Sept., 1921	133	23 97	1,146	0·45	42 97	19 00	.....	8·61	14·28	18·02	25·50	28·70
Oct., 1921	82	15 00	1,115	0·53	49 25	34 25	.....	13·59	41·76	18·29	16·15	43·84
Average for 12 months	162	416 42	27,728	56·9	1,316 45	916 70 16 67 $900 03	16 67	170·33	5·54	$2·50	18·0	46·70
Average for 6 winter months	185	265·05	16,688	69·5	936·44	688 06 16 67 671 39	16 67	91·74	3·62	$1·45	18·96	50·5

FEED, COST OF PRODUCING EGGS AND AVERAGE PROFIT OVER FEED (6 MONTHS) YEARLING HENS HATCHED AND REARED IN 1919

Month	No.	Cost of feed	No. eggs laid	Price sold	Value	Profit	Loss	Cost of feed per bird	Eggs per bird	Cost per doz. eggs	Profit per bird	Per cent production
		$ cts.		cts.	$ cts.	$ cts.	$ cts.	cts.		cts.	cts.	
Nov., 1920	58	18 29	464	0·85	30 47	12 18	.....	31·5	8	43·00	21·00	26·00
Dec., 1920	58	12 43	335	0·90	25 12	12 69	.....	21·4	5·77	45·00	21·87	18·61
Jan., 1921	58	12 36	66	0·75	4 13	.....	8 23	21·3	1·13	2 25·00	14·18	3·64
Feb., 1921	58	12 19	257	0·70	14 99	2 80	.....	21·0	4·43	57·00	4·82	15·82
Mar., 1921	58	14 17	794	0·58	38 38	24 21	.....	24·4	13·68	21·50	41·74	44·12
April., 1921	55	11 75	959	0·39	31 16	19 41	.....	21·4	17·43	14·50	35·29	58·10
Average for 6 months	57	81 19	2,875	69·5	144 25	71 29 8 23 63 06	.....	$1 4	50	28·2	$1 09	27·8
Average for 6 months for 185 pullets	185	265 05	16,688	69·5	936 44	671 39	16 67	1·45	91·74	18 96	3·62	50·5

COMPARISON OF RESULTS OF PULLETS DURING TWO YEARS (NOV. 1, 1919 TO OCT. 31, 1920) VS. (NOV. 1, 1920 to OCT. 31, 1921)

Year	Average No. birds in pens for 12 months	Total cost of feed each year	Total eggs laid each year	Average price eggs sold per doz.	Total value of eggs	Profit from eggs over cost of feed	Average eggs per bird in 12 months	Average profit per bird in 12 months	Average cost per bird for feed in 12 months	Average cost to produce 1 doz. eggs in 12 months	Average per cent production
		$		cts.	$ cts.	$ cts.		$ cts.	$ cts.	cts.	
Nov. 1, 1919 to Oct. 31, 1920	139	434 18	16,794	71·4	999 66	565 51	121	4 07	4 12	31·4	32 89
Nov. 1, 1920 to Oct. 31, 1921	170·5	416 42	27,728	56·25	1,316 45	900 03	170·33	5 31	2 51	25 34	46·69

NOTE.—In 1919-20 the average eggs per bird was 121 with 7 birds making records of over 200 eggs. In 1920-21 the average eggs per bird was 170⅜ with 50 birds making records of over 200 eggs.

VALUE OF SELECTION

During the time which may be called the pullet year of laying, namely, November 1 to October 31, some very interesting results have been obtained in record work, as will be noted from the preceding table of comparisons. The soundness of belief that rigid selection will do much to raise the standard of production has been fairly clearly demonstrated in a comparison of the past year's results with the year previous. On all pullets kept in 1919-20, the average eggs per bird for twelve months was 121 eggs, while in 1920-21, this average was raised to 170 eggs per bird. In the year 1919-20, there were 7 birds that finished with a record of over 200 eggs, while in 1920-21 some 50 birds have finished with over 200 eggs in their pullet year, the highest, No. E 12, having 301 eggs as her record, closely followed by No. E 48 with 290 eggs.

COST AND RESERVE FIGURES

Figuring the eggs sold at the average price of 56 cents per dozen for the year, the value of the 301 eggs laid by E 12, would amount to $14.04, or taking the 290 eggs laid by E 48 at same rate would amount to $13.53.

The average cost of feed per bird for the year was $2.51. This would leave a profit over cost of feed per bird of $11.53 and $11.02 respectively from these two birds. These profits would be very misleading, if taken as an average from a flock, and it will be noted that in this flock there were enough slackers to bring the average profit per bird over cost of feed to $5.31. To get this average profit per bird, over cost of feed, with eggs selling at the average price quoted above for the year, required an average per cent production per day of slightly over 46½ per cent. The real value, however, of high record hens is their value as breeders, to transmit to their progeny the ability to be good producers.

Lennoxville Champion E 12 with 301 eggs to her credit, is a bird of very strong constitution, active and alert. Her sire was a bird of exceptionally strong prepotency, twenty-eight of his daughters making an average of 154 eggs in the first nine months of their laying year. E 12 made no very outstanding consecutive laying, her best being 37 eggs in 37 days, but very steady work, even during moult, won for her the place of honour.

Lennoxville Dandy E 48, 290 eggs, is a hen of smaller type than E 12, but is of very active nature and is sired by the same male as E 12. Her dam, Lennoxville Princess, D 120, has a pullet year record of 217 eggs, and is also a very strong breeder, giving 100 per cent fertility both in her pullet year and as a yearling. She has eleven daughters in the pens this winter for trapnesting, and four sons are being held for next year's breeding. E 48 was used in the breeding pens as a pullet, and has now three daughters in the pens for trapnesting. She has also two sons which are showing splendid development at present and these are being kept for breeding work next spring. Evidently E 12 or E 48 did not consider that they could spare time for brooding, as neither has become broody once yet. These hens will be used in special breeding pens for next season, and good results are being looked for. Below is shown a copy of the records of one of the special pens to be used for 1922 breeding. This pen is mated to a cockerel from a 290 egg mother.

PEN A--BREEDING SEASON 1922

Hen Nos.	Winter Record	Year Record
E8	105	264
E12	92	301
E15	61	225
E20	78	226
E22	92	252
E25	96	245
E40	61	242
E78	85	238
E90	79	233
E125	57	234
D50	60	226
D120	56	217

EARLY VS. LATE HATCHED PULLETS

Project 89.—In order to support the belief that early hatched pullets are the most profitable for winter egg production with some actual figures, a comparative test of a certain number of early-hatched pullets versus the same number of late-hatched pullets is being carried on each winter at this Farm. The Pens are kept under exactly the same conditions and management and the different results noted. During the winter of 1920-21, lot No. 1 had 25 pullets hatched between April 13 and May 1, while lot No. 2 had 25 pullets hatched between May 1 and May 15. During the winter of 1921-22, lot No. 1 had 25 pullets which were hatched between April 7 and April 15, while lot No. 2 had 25 pullets hatched between May 1 and May 8. This test has not been completed yet and only the first two months' results can be given in the table. It was thought that possibly the early-hatched lots would call a halt in the latter months of the test and that the late-hatched would equal the number of eggs at least, if not the values of the eggs laid, but such was not the case in 1920-21. The following tables will show the results received from the test in 1920-21 and also the results of the first two months of the 1921-22 test.

EARLY VERSUS LATER HATCHED PULLETS FOR WINTER EGG PRODUCTION, 1920–21
Lot No. 1 (Early) (25 Birds)

Month	Cost of feed	Eggs laid	Value of eggs	Profit over cost	Loss	Average profit per bird
November	$ 7 00	231	$ 17 32	$ 10 32	.....	$ 41½
December	6 95	550	41 25	34 30	.....	1 37
January	6 07	531	33 19	27 12	.....	1 08½
February	6 00	486	28 35	20 85	.....	86½
Total	$ 26 77	1,798	$ 120 11	$ 93 34	.....	$ 3 73

Lot No. 2 (Late) (25 Birds)

Month	Cost of feed	Eggs laid	Value of eggs	Profit over cost	Loss	Average profit per bird
November	$ 6 50	15	$ 1 12	.....	$ 5 38	.....
December	6 75	266	19 95	$ 13 20	.....	$ 52½
January	6 00	418	2o 10	20 10	.....	80½
February	5 50	369	21 53	15 97	.....	63½
Total	$ 24 75	1,068	$ 68 70	$ 49 27 Less 5 38 $ 43 89	$ 5 38	$ 1 97

SUMMARY FOR FOUR MONTHS

—	Cost of feed	Eggs laid	Profit over feed	Average profit
Lot No. 1	$ 26 77	1,798	$ 93 34	$ 3 73
Lot No. 2	24 75	1,068	43 89	1 75½

EARLY VERSUS LATER HATCHED PULLETS FOR WINTER EGG PRODUCTION 1921–22

Lot No. 1 (Early) (25 Birds)

Month	Cost of feed	Eggs Laid	Value of eggs	Profit over feed	Loss	Average profit per bird
November	$ 3 88	442	$ 23 94	$ 20 06	.....	80¼
December	3 95	454	28 97	25 02	.....	1 00
Total	$ 7 83	896	$ 52 91	$ 45 08	.....	$ 1 80¼

Lot No. 2 (Late) (25 Birds)

Month	Cost of feed	Eggs laid	Value of eggs	Profit over feed	Loss	Average profit per bird
November	$ 3 75	135	$ 7 31	$ 3 56	.....	$ 14¼
December	3 80	375	23 91	20 11	.....	80½
Total	$ 7 55	510	$ 31 22	$ 23 67	.....	94¾

NOTE.—It should also be worthy of note that lot No. 1 had laid 232 eggs in October before start of test, which would be valued at $9.66, leaving a profit over feed of $5.16 additional.

From the results already noted it is safe to say that pullets must be hatched early enough to be well matured and ready to lay during the early winter months, if the most profitable returns are to be expected.

DISPOSAL OF THE STOCK

In July, 125 cockerels from hens with the lowest records were culled out of the growing stock, and were disposed of as broilers. This allowed better space for the growing stock on the range and also in the houses. During the last week of September, 200 pullets were selected for the winter laying houses on the Farm, and 150 pullets were sent to La Ferme and Kapuskasing Farms to commence poultry work there. Fifteen of the best cockerels were kept on the Farm for use in the breeding pens; over 50 cockerels from hens with records of 175 to 226 eggs were sold to farmers, and the remanded used for experiments in crate feeding and then sold as dressed poultry.

Project 92.—CRATE FEEDING EXPERIMENTS

They were fed a mash consisting of equal parts of barley meal and white middlings mixed to a sloppy state with sour skim-milk, if available, or water. The period of feeding in all lots was three weeks, and the following will show the costs and results.

MILK VS. WATER

Lot No.	No. of Birds	Total lbs. at Start	Cost of Feed	Total weight after 3 weeks	Gain in Weight in 3 weeks	Average gain per bird in 3 weeks	Cost per lb. gain	Remarks
1	15	38	$ 2.25	60½	22½	1½	.10¼	Sour skim-milk used to mix feed.
2	36	162	8.80	211	49	1⅜	.17⅞	Water used to mix feed.
3	45	148	10.25	209	61	1⅜	.16⅞	Water used to mix feed.

NOTE.—Cheaper gains were evident where skim-milk was used to mix the feed.

EGG PRESERVATIVE TEST

Project 101.—The inquiries regarding the value of Fleming Egg Preservative as a means of storing eggs led us to make a test of this preservative. On August 3, 1920, a certain number of eggs were treated according to directions, namely, that of simply rubbing a slight coating over the shell of the eggs to exclude the air from the contents, and then storing the eggs in a dry, airy place. The eggs were to be candled every three months in the year, and one-fourth of the quantity were to be broken each period to determine the quality of the contents. At three months and six months all the eggs were in splendid condition when candled and the ones that were broken to be examined were in good condition for use. At nine months' time, one egg was found, when candled, to be unfit for food, remainder in good condition. At twelve months' time the remainder were broken, and were in apparently good condition with the exception of a slight, musty odour, which may have been due to the eggs being in a damper place during last period of test.

The ease of application to eggs and the simple method of storing are strong points in favour of a preservative such as was tried, and it may prove a great benefit to anyone who has to store eggs for home use.

EXTENSION AND PUBLICITY

EXCURSIONS

Several small gatherings from different neighbourhoods visited the Farm during the year, as well as a large number of farmers and townspeople. Much interest was taken in horticulture and poultry. The animal husbandry work is very popular throughout the year with all visitors, as are the field crops in summer.

In June an invitation was extended to the poultrymen and all interested in poultry to visit the poultry plant and inspect the work under way in regard to improving the production by trapnesting and selection. A good number responded to this invitation. Mr. George Robertson, of the Central Farm, was present and addressed the gathering, as well as Senator Pope from Cookshire, Mr. Berwick, President of the Sherbrooke Poultry Association, Mr. C. J. Wright, Sherbrooke, Que., and Mr. J. D. Lang.

The Annual Farmers' Day gathering was held on August 10. The weather being favourable, a very large assemblage of farmers and their families from all parts of the Eastern Townships was present. The attendance was estimated at 2,500 people. This Annual Farmers' Day is looked upon as a get-together gathering where farmers and their families meet to get better acquainted and have an opportunity of discussing their farm problems together as well as with the staff of the Farm. The forenoon was spent in inspecting live stock, poultry, farm crops, horticulture and other lines of work being carried on. Lunch was served at noon.

Everyone was delighted to have present that day to address the gathering, the Hon. Dr. Tolmie, Minister of Agriculture, Dr. J. H. Grisdale, Deputy Minister, Mr. E. S. Archibald, Director of the Experimental Farms System, Mr. Charron of the Provincial Dairy School, St. Hyacinthe, Mr. Roy and Mr. Meheux, Representatives of the Provincial Department of Agriculture, Miss Chute of the Domestic Science Branch of Macdonald College, Senator Pope and Mr. J. H. Crepeau. There were also sports and a baseball game on the lawn for the young people.

EXHIBITIONS

At the Great Eastern Exhibition held in Sherbrooke, Que., from August 27 to September 3, the Farm occupied a space in the Main building of fifty feet frontage, with a 14 by 14 foot space at one end of the exhibit that was used as an office and rest room where visitors could drop in and discuss any matters pertaining to agricul-

ture, with the staff in charge. The opportunity given the Farm by the Eastern Townships Agricultural Association in granting this space in the Main building is much appreciated, as it makes it possible to get in to touch with so many more visitors. A full line of exhibition circulars was always on hand for distribution and a great number of names were secured for the mailing lists. The exhibit was a good, representative exhibit of the different divisions of the work under way at the Lennoxville Station, such as animal husbandry, field husbandry, horticulture, forage crops and poultry.

The Farm also had a poultry exhibit in the Poultry building, of 30 feet frontage, consisting of transparencies, models, legends and other poultry equipment, as well as day-old chicks. This exhibit was in charge of Mr. J. D. Lang, Poultryman of the Station.

The Richmond fair was attended with the Farm Exhibit in charge of Mr. T. F. Ritchie, Assistant to the Superintendent. This is a three day's fair held in the town of Richmond, Que. This country organization is a very live one and is making rapid progress. The exhibit was much appreciated by the Directors and public who showed much interest in the work that is being carried on at Lennoxville.

The Ste. Scholastique Fair held at Ste. Scholastique, Que., from September 19 to 23 was attended with the Farm exhibit, where practically all divisions of the Station were represented. This is a fair which has developed rapidly in the past few years until it is one of the principal exhibitions of the province. There was a large attendance, much interest shown and many inquiries made regarding agriculture. This exhibit was in charge of Mr. M. D. MacCharles, Field Husbandman at this Station.

The first Annual Fair of the Compton County Agricultural Association was held at Cookshire on September 20 and 21, at which the Station was represented with exhibits from the Horticultural and Poultry Departments. The horticultural exhibit was in charge of Mr. T. F. Ritchie and the poultry in charge of Mr. J. D. Lang.

This organization deserves much credit for what was done in the short time at their disposal to get the grounds and buildings into shape for the fair. The exhibit of live stock compared very favourably with some of the large fairs.

The Poultry Show held at Sherbrooke in the month of January under the auspices of the Sherbrooke Poultry Association was attended with the poultry exhibit, consisting of transparencies, models, legends, and feeds, etc., and also with birds of high-producing records from the poultry plant. This was the means of creating a great deal of interest in better stock, and has increased the inquiries for breeding stock and for information on care and housing of same.

JUDGING AT FALL FAIRS

The staff at the Lennoxville Experimental Station acted as judges at the following fairs:—

Mr. J. A. McClary, Superintendent, acted as judge at:—
Stanstead County Fair, Ayer's Cliff, Que.—Beef cattle.
Richmond County Fair, Richmond, Que.—Beef cattle.
Wolfe County Fair, Marbleton, Que.—Dairy and beef cattle.
Drummond County Fair, L'Avenir, Que.—Beef cattle.
Danville Union Agricultural Society, Danville, Que.—Beef cattle.
Calf Feeding Competition, La Patrie, Que.
Calf Feeding Competition, Compton, Que.
Also acted as judge at the Provincial Ploughing Match, Quebec, Que.
Mr. T. F. Ritchie, Assistant to the Superintendent, acted as judge at:—
Stanstead County Fair, Ayer's Cliff, Que.—Fruit and vegetables.
Eastern Townships Agricultural Association Fair, Sherbrooke, Que.—Honey and maple products.

Richmond County Fair, Richmond, Que.—Fruit and vegetables
Compton County Fair, Cookshire, Que.—Fruit and vegetables.
Also acted as judge at the school fairs at Lennoxville, Cookshire, and Scotstown, Que.

Mr. J. D. Lang, Poultryman, acted as judge at:—
Poultry Exhibit of the Eastern Townships Agricultural Association, Sherbrooke, Que., and judged utility classes of Barred Rocks, Wyandotte and Rhode Island Reds.
Poultry Exhibit at St. Stephen, N.B., and judged all varieties of fowl, turkeys and waterfowl.
Compton County Fair, Cookshire, Que., judged poultry.
Also acted as judge at the school fairs at Lennoxville and Cookshire, Que.

MEETINGS ATTENDED

The following gatherings were attended during the year by J. A. McClary, Superintendent:—
Provincial Ploughmen's Association meeting, Quebec, Que.
Eastern Canada Live Stock Committee meeting, Montreal, Que.
Field day and farmers' picnic of the St. Francis Jersey Club, Waterville, Que.
Ayrshire field day, Ayer's Cliff, Que.
Visited Experimental Stations in New England States.
Stanstead County Ploughmen's match and prize distribution, Stanstead, Que.
Sherbrooke County Ploughmen's match and prize distribution, Capelton, Que.
Farmers' Club annual supper and prize distribution, Waterville.

The following gatherings were attended by T. F. Ritchie, Assistant to the Superintendent:—
Canadian Ayrshire Breeders' Association, Montreal, Que., and sale of pure-bred stock at Macdonald College.
Farmers' picnic of the St. Francis Jersey Club, Waterville, Que.
Annual picnic of the Farmers' Club, North Hatley, Que.; also Farmers' Club annual picnic at Compton, Que.
Mr. Ritchie also attended a number of Women's Institute and Farmers' Club meetings at which he gave talks and illustrated lectures on vegetable gardening and improvement of home surroundings.

The following exhibitions and meetings were attended by J. D. Lang, Poultryman:—
Annual Farmers' Club meeting, Waterville, Que.
Ottawa Winter Fair, Ottawa, Ont.
Sherbrooke Poultry Show, Sherbrooke, Que.
Farmers Co-operative Association and Women's Institute meeting, Tomifobia, Que.
Ormstown Live Stock Show, Ormstown, Que.
Several meetings of the Sherbrooke Poultry Association.

Mr. M. D. MacCharles, Field Husbandman, attended the Ayrshire Field Day at Ayer's Cliff, Que., and the following exhibitions:—
Stanstead County Agricultural Fair, Ayer's Cliff, Que.
Eastern Townships Agricultural Association Fair, Sherbrooke, Que.
Richmond County Fair, Richmond, Que.
Ste. Scholastique Exhibition, Ste. Scholastique, Que.

GENERAL FARM NOTES

BUILDINGS

A new cottage was built on the north side of the Cookshire road on the former Soldier Settlement farm, which makes a very creditable acquisition to the Farm as a residence of one of the staff.

A building was erected over the platform scales, on a concrete foundation, so that the scales can be used at any time of the season.

There was also erected, from timber taken from other old buildings at the Soldier Settlement farm, an implement shed 25 by 50 feet with storage above, which is very convenient for the storage of implements required only a short time through the year.

A building 16 by 20 feet was put up, which is used as a bull pen for the Shorthorn herd sire.

There was suitable repair work done on the original house on the Soldier Settlement farm, which, when completed, will be used as the superintendent's house. Necessary repair work was also done on other buildings.

There was a line of 963 feet of water pipe run from the dairy building, where the deep well and pump are located, past the new cottage to the barns and also to the house on the Soldier Settlement farm.

ROADS

There was constructed the past season, a road of 290 rods running north from the dairy building, crossing the Lennoxville-Cookshire road and continuing across the former Soldier Settlement property. Three cement culverts were made for this road and it was graded and put into shape for gravel in the month of October. Gravel was drawn in the months of November and December to surface it.

Other roads running through the Farm were kept in repair and considerable gravel added where necessary.

The private road built on the east side of the Farm, for the accomodation of the Farm and the pupils attending the Ascot Consolidated School, was completed, so that vans carrying scholars can pass through on this road and save two miles of travel.

FENCES

New fences were built on both sides of the new road running from the dairy building through the former Soldier Settlement farm, also a fence of 25 rods on the north line of this farm, 60 rods running east from the new road and a certain amount around the Soldier Settlement farm buildings, the total amount of fence being 460 rods.

There was also constructed 60 rods of new fence on the road from the Ascot Consolidated School leading south on the east boundary, and 50 rods in fencing paddock near dairy barn.

Ninety rods of new fence was built to renew what was taken out by the ice in the spring freshet of the St. Francis river, making a total of 660 rods erected this season. This fence consists of nine strands of 48 No. 9 heavy wire, with good, uniform posts well braced at corners, 16 feet apart.

DRAINAGE

There was 2,597 feet of tile drainage put in the variety orchard and 2,061 feet in the Soldier Settlement farm between the new cottage and the original residence. Four to six-inch tile was used for this purpose.

There was other work done in open drainage and looking after outlets of underdrains which have been put in from year to year.

CLEARING LAND

A certain amount of work was done in clearing land, especially on the Soldier Settlement farm, such as, cutting scrub brush in the pasture. During December seven acres of brush were cut and any firewood suitable for fuel was saved.