DOMINION OF CANADA

DEPARTMENT OF AGRICULTURE

DOMINION EXPERIMENTAL FARMS

INTERIM REPORTS

OF THE

STATIONS IN NORTHERN ONTARIO AND QUEBEC

KAPUSKASING, ONT.
LA FERME, QUE.

FOR THE YEAR ENDING MARCH 31, 1921.

Printed by authority of the Hon. S. TOLMIE, Minister of Agriculture, Ottawa, 1921.
29545—1

EXPERIMENTAL STATION, KAPUSKASING, ONT.

REPORT OF THE SUPERINTENDENT, SMITH BALLANTYNE

YEAR ENDING MARCH 31, 1921

WEATHER

During the winter of 1919-20 the snowfall was quite heavy, and, owing to fairly uniform cold weather, was five feet on the level. The snow, however, was quite loose, and did not settle to any great extent, as there were no thaws to melt it during the winter. Spring opened up fairly early, and the first seeding was done on May 10th. Seeding conditions were favourable, and dry weather continued until the latter part of June. As a result of this dry spell the hay crop was light, but good rains throughout July were favourable for all grain crops. Early sown grains matured well, but a frost of five degrees on August 20th hampered the maturing of oats, wheat and peas sown after May 24th. Favourable weather prevailed during harvest and during the fall.

METEOROLOGICAL RECORDS

Months	Temperature Fahrenheit			Precipitation			Sunshine
	Maximum	Minimum	Mean	Rainfall	Snowfall	Total	
1920.	Degrees	Degrees	Degrees	Inches	Inches	Inches	Hours
April	62	2	33·9	1·90	14·5	3·35	73·8
May	82	20	46·5	1·20	—	1·20	210·8
June	82	33	59·2	1·45	—	1·45	250·2
July	82	34	56·9	2·60	—	2·60	224·5
August	87	27	59·5	1·40	—	1·40	278·9
September	87	22	55·2	3·10	—	3·10	173·4
October	75	10	45·9	1·50	—	1·50	151·2
November	40	-11	21·7	—	3·0	0·30	70·0
December	41	-31	17·2	1·25	6·5	1·90	46·9
1921.							
January	47	-37	4·9	0·15	13·7	1·52	101·8
February	33	-44	8·7	0·50	2·5	0·75	122·0
March	57	-28	7·6	4·20	14·6	5·66	125·0
Totals	—	—	—	19·25	54·8	24·73	1,828·5

ANIMAL HUSBANDRY

BEEF CATTLE

The beef herd at present consists of fifteen grade Shorthorn cows, seven yearling calves and ten young calves. This herd was wintered cheaply on ensilage, roots, cut straw, hay and a small amount of meal. The following table gives the amount and cost of feed for each cow. During the summer months the herd was five months on pasture. The beef herd is headed by Kentville Marconi —130631— a good type of Shorthorn, procured from the Experimental Station at Kentville, N.S.

COST OF FEEDING SHORTHORN COWS.

Number of cows	Pounds of Ensilage fed for seven months per cow: 2,093 lbs. at $5. per ton	Pounds of Straw fed for seven months per cow: 1,860 lbs. at $10. per ton	Pounds of Hay fed for seven months per cow: 310 lbs. at $20. per ton	Pounds of meal fed for seven months per cow: Bran 2 parts Screenings 2 parts Oilmeal, 1 part Total, 784 lbs. at $2.02 per cwt.	Five months on pasture at $3 each per month	Total cost of feed for year each cow
15	$5·25	$9·30	$3·10	$15·84	$15·00	$48·49

PASTURE VS. STABLE FEEDING

An experiment was conducted with ten Shorthorn grade calves to determine the value of feeding on pasture versus stable feeding. Five animals were put on pasture, with their dams, from June 1 to November 1, and five were fed on hay and meal consisting of finely ground oats, 2 parts, bran, 2 parts and oilcake meal, 1 part. These calves were turned out with their dams morning and evening. The calves on pasture made gains at a cost of 5·8 cents per pound, and those in the stable made gains at a cost of 13·2 cents per pound. The calves on pasture made the greater and decidedly the cheaper gains. The following table gives an outline of the experiment:—

PASTURE VS. STABLE FEEDING

	Weight of calves June 1, 1920	Weight at end of experiment, Nov. 1, 1920	Total gains	Weight of Hay fed at $35.50 per ton	Weight of Oats fed at $1.10 per bush.	Weight of Bran fed at $45.25 per ton	Weight of Oilcake fed at $87.00 per ton	Pasture for dams at $3.00 per month each	Pasture for calves at $1.00 per month each	Total cost of feed	Cost to produce 1 pound gain
Group No. 1— 5 calves fed in stable	1,462 lbs.	3,055 lbs.	1,593 lbs.	3,750 lbs.	900 lbs.	900 lbs.	450 lbs.	5 cows		$210.55	13·2 cents
Group No. 2— 5 calves on pasture...	1,472 lbs.	3,188 lbs.	1,716 lbs.	.....	.....	.....	.....	5 cows	5 calves	$100.00	5·8 cents

FEEDING BABY BEEF CALVES

Number of Calves	Weight of Calves November 1, 1920	Cost price of Calves November 1, 1920, at 5·8 cents per lb.	Weight of Calves at end of Experiment May 1, 1921	Total Gain	Weights and cost of Feeds						Profit over cost of feed
					8,630 pounds of Hay at $20.00 per ton	7,270 pounds of Ensilage at $5.00 per ton	3,494 pounds of Roots at $5.00 per ton	4,516 pounds of Meal at $2.51 per cwt.	Total Cost of Feed	Dressed weight and selling price of beef May 1, 1921	
5	lbs. 3,244	$ cts. 118 15	lbs. 4,487	lbs. 1,243	$ cts. 86 30	$ cts. 18 17	$ cts. 8 74	$ cts. 114 23	$ cts. 227 44	$ cts. 955 lbs. at 18½ 176 63 1,611 lbs. at 19 306 09 $482 72	$ cts. 67 13

Group No. 1 was fed loose in a box stall and turned with their dams night and morning. The meal ration for group No. 1 was fed twice per day, and consisted of finely ground oats, 2 parts, bran, 2 parts, and oilcake, 1 part. A good quality of hay was fed. Labour was not charged to group No. 1.

Group No. 2 were with their dams all the time on pasture.

BABY BEEF EXPERIMENT

An experiment was commenced on November 1 with the feeding of baby beef calves to determine the profit or loss in feeding. These calves were fed loose in a roomy box stall on hay, ensilage, roots and meal. The meal ration consisted of bran, 2 parts, ground oats, 2 parts, and oilcake meal and cotton seed meal, 1 part. A total gain was made in live weight of 1,243 pounds. The total cost of feed was $227.44, and the profit over cost of feed was $67.13. The dressed weight was 57·7 per cent of the live weight, which indicated that the calves were well finished. The result in tabulated form will be found on page 5.

DAIRY CATTLE

Northern Ontario is well adapted for mixed farming, as pastures are good. Forage crops and grain for the feeding of live stock can be grown with success, and water for live stock is plentifully supplied by the many small streams, rivers and lakes. Dairying is one of the most profitable branches of the live stock industry, as there is a keen demand for milk and all dairy products in the numerous towns, cities and lumber and mining camps. In fact, it is not uncommon for some of the cities to be short of a milk supply, and a large amount of canned milk is used by the camps. There are, approximately, 106,874 cattle of all classes in Northern Ontario, of which 39,527 are milch cows.

The dairy herd at this Station this year consisted of ten Ayrshire grades and three grade Holstein cows, seven two-year-old Ayrshire heifers, five yearling calves, and the herd sire. Of the thirteen dairy cows, nine finished their lactation period. Two cows, unfortunately, were poisoned in midsummer by eating stumping powder picked up on some new land. Another cow was sold, and an aged cow was a reactor from the tuberculin test and had to be slaughtered. The herd has now no reactors. Spring Bank King—40647—the herd sire, that had been used to head the herd for the past three years, was transferred to the La Ferme Experimental Station in August, and exchanged for Cavalier of Elm Lane—46472—a good type of Ayrshire bull that should give satisfactory results in breeding up the dairy herd. The cows and young stock were on pasture from June 1 to November 1. This was rather a short time on pasture. If the pasture season could be lengthened a cheaper production of milk would result.

An effort will be made to provide early pasture by the sowing of such crops as fall rye and winter vetch, and, as more cleared land becomes available, there will be more clover and grasses to keep up the pasture in the fall.

The following table shows the production of the individual cows of the herd, with costs of feed, and it will be noticed that the cost of production of milk is lowest with the cows that give the largest amount of milk; and the cost of production is highest with the lowest producing cows. This indicates the importance of keeping good cows with a high production of milk and butter fat.

DAIRY HERD RECORDS, YEAR 1920

Name of cow	Grade of breed	Date of dropping calf	Number of days in lactation period	Total pounds of milk for period	Daily average yield of milk	Value of whole milk at 10c. per quart	Amount of meal eaten at $2.02 per cwt.	Amount of hay eaten at $20 per ton	Amount of green feed eaten at $5 per ton	Amount of straw eaten at $10 per ton	Amount of ensilage eaten at $5 per ton	Number months on pasture at $3	Total cost of feed for period	Cost to produce 100 pounds milk	Per cent and total pounds of fat produced		Profit or loss on cow for period, labour and calf neglected
						$ cts.							$ cts.		%	lbs.	$ cts.
White	Holstein	April 10, 1920	321	9,413	26·2	376 52	2,711	4,995	.....	.....	6,821	5	136 76	1 45	3·55	329	239 76
Maud	"	February 27, 1920	352	8,791	25·0	351 64	3,091	5,795	2,554	532	3,514	5	155 72	1 77	3·4	299	195 92
Dora	"	January 25, 1920	431	7,722	18·0	308 88	2,850	6,290	3,549	532	3,514	5	155 78	2 02	3·7	285·7	153 10
Maggie	Ayrshire	April 3, 1920	346	10,631	30·7	425 24	2,778	4,628	3,549	532	2,514	5	137 71	1 30	3·5	372	287 53
Dewdrop	"	February 25, 1920	286	7,363	25·7	294 52	2,606	5,435	2,499	532	2,722	5	137 72	1 87	4·2	309·2	156 80
Pheobe A	"	November 31, 1919	252	3,798	10·8	151 92	2,107	5,267	1,071	.....	2,945	5	120 27	3 17	4·4	167	31 65
Peggy	"	January 23, 1920	389	8,284	21·3	331 36	2,894	5,838	3,549	408	2,837	5	148 84	1 79	2·9	250	182 52
Julia	"	January 30, 1920	368	6,663½	18·1	266 52	2,786	6,122	2,083	532	4,755	5	152 26	2 28	3·9	259	114 26
Flora	"	November 20, 1919	320	7,707	24·1	308 28	3,047	6,830	2,780	284	4,211	5	163 75	2 12	4·0	308	144 53
Jessie B	"	October 25, 1919	277	4,100	14·8	164 00	1,555	5,319	.....	.....	1,761	2	94 90	2 31	4·2	172	69 10
Mary	"	November 10, 1919	216	4,152	19·2	166 08	1,466	4,230	413	.....	1,761	1	80 35	1 93	3·7	153	85 73
Darkie	"	October 10, 1919	319	8,539	26·8	341 56	2,730	5,471	413	.....	2,438	2	125 98	1 47	4·5	384	215 58
Queen	"	January 20, 1920	194	3,763½	19·4	150 52	1,282	3,505	.....	.....	142	2	68 37	.....	4·5	169	82 15

DAIRY CALF FEEDING EXPERIMENT

An experiment with the feeding of dairy calves was conducted to determine the relative value of different meal mixtures fed with and without skim-milk.

Group No. 1 was fed skim-milk with hay and Monarch meal, and made gains at a cost of 19·7 cents per pound. Group No. 2 was fed skim-milk with a meal mixture consisting of finely ground oats, 2 parts, ground corn, 2 parts and ground flax, 1 part. These calves made gains at a cost of 18·6 cents per pound. Group No. 3 was fed the same meal mixture as group No. 2, with hay and water instead of skim-milk. These calves were the largest of the groups, and averaged 393 pounds in weight at the beginning of the experiment. Gains for this group were made at a cost of 24·3 cents per pound. The following table shows the cost of feed, etc. As the feed costs were very high the calves did not make profitable gains. Group No. 2 made the cheapest gains, and group No. 3 without skim-milk, the most expensive gains:—

CALF FEEDING EXPERIMENT WITH DAIRY CALVES

Numbers	Description and weight of feeds fed	Cost per cwt.	Total Cost	Duration of Experiment	Initial Weight	Total Gains	Cost per pound gain
		$ cts.	$ cts.	Days	Pounds	Pounds	Cents
No. 1	Monarch Feed, 544 lbs.	6 00					
	Hay, 1,220 lbs.	35 50 ton	68 59	122	555	349	19·7
	Skim-milk, 2,860 lbs.	0 50					
No. 2	Meal mixture total weight 544 pounds made up as folllows:—						
	Ground oats, 2 parts	3 24					
	Ground corn, 2 parts	5 10					
	Ground flax, 1 part	12 50					
	Hay, 1,220 pounds	35 50 ton	67 71	122	466	364	18·6
	Skim-milk, 2,860 pounds	0 50					
No. 3	Meal Mixture total weight 718 pounds made up as follows:—						
	Ground oats, 2 parts	3 24					
	Ground corn, 2 parts	5 10	63 58	122	786	261	24·3
	Ground flax, 1 part	12 50					
	Hay, 1,220 pounds	35 50 ton					

Conclusions.—Group No. 2 made the most economical gains and group No. 3, without skim-milk, the most expensive gains. Group No. 2 also made the greatest and group No. 3 the smallest gains.

The feeds used in the experiment, with the exception of skim-milk, proved too expensive at these cost prices to make profitable gains.

HORSES

There are sixteen horses at this Station, consisting of a good type of Clydesdales, averaging about fifteen hundred pounds. The horses are kept at work throughout the year; in summer at ordinary routine work, and in winter at drawing firewood, pulpwood, manure and regular supplies.

No experimental work has been done, as the horses are kept for working purposes only. A total of 10,411 hours' team work was done on the Farm, as follows:—

	Hours
Land clearing	949
Messenger service	602
Fuel	1,289
Hauling manure	1,343
Building operations	652
Live stock bedding	245
Labour sundries	965
Field husbandry	2,320
Cereals	231
Horticulture	80
Forage crops	1,181
Land drainage	336
Fencing	81
Water and light	15
Roads	44
Live stock feeds	78

All the horses were stable-fed throughout the year, owing to a shortage of pasture land. An average of 22 pounds of hay and 14 pounds of grain was fed per day throughout the year. A feed of boiled oats and bran was given every Saturday night and on Sundays. The grain and hay rations were reduced when horses were idle.

The total amount of feed consumed during the year was as follows:—

64·24 tons hay at $20 per ton	$1,284 80
2,150 bushels oats at 68 cents per bushel	1,462 00
2,665 pounds bran at $45.25 per ton	60 30
Total cost of feed	$2,807 10
Average cost per horse	175 44
Average cost per hour horse labour	19·5 cents

SHEEP

The flock at present consists of fifteen pure-bred Shropshire ewes, nine shearlings and twenty-three spring lambs, all pure-bred. The flock is headed by a good pure-bred, low set, blocky type of ram that is giving good results in breeding up the flock. The ewes are given plenty of free range during the winter months, which has kept them vigorous; and the flock was allowed the run of the pasture from the latter part of April to the end of November. During the winter, hay was fed in a clean yard during fine days, and in rough weather feed was given inside.

Seventy-five pounds of good mixed hay was fed to the flock per day. No grain was fed until the middle of February, as the sheep were quite fat during the first part of the winter. A light meal mixture of one-half pound per head per day was fed from February 15 to May 15. The meal ration consisted of two parts ground oats, two parts bran and one part oilcake. Fifty pounds of pulped turnips were fed the flock per day during March and April.

COST OF FEED AND PROFITS FROM FARM FLOCK

Pasture, 7 months at 25 cents per month, each	$ 43 75
Hay, 11,325 pounds at $20 per ton	113 25
Bran, 529 pounds at $45.25 per ton	11 97
Oats, 505 pounds at 68 cents per bushel	10 10
Oilmeal, 177 pounds at $87 per ton	7 70
Roots, 3,050 pounds at $5 per ton	7 62
Total cost of feed	$194 39
Cost of feed per head	7 78
Proceeds from lambs to settlers	$105 85
Nine shearlings at $20 each	180 00
Total proceeds	$285 85
Profit over cost of feed	91 46

Wool crop not yet sold.

SWINE

COST OF MAINTAINING BREEDING STOCK

Nine pure-bred Yorkshire sows are kept, and the progeny from this breeding stock is used for experimental work, or sold for breeding purposes. The sows are given the run of large open yards for exercise, summer and winter, and this has contributed greatly to the health and vigour of the stock. Eight sows have farrowed this spring, with an average of 13·3 to a litter. The feed of nine sows and one hog

consisted of ground screenings, barley and oats, bran, oilmeal and roots. The following average amounts were fed each month:—

Screenings, 1,421 pounds at $1.65 per hundred	$23 46
Barley, 270 pounds at $2 per hundred	5 40
Bran, 312 pounds at $2.26 per hundred	7 05
Oats, 237 pounds at 68 cents per bushel	4 74
Oilmeal, 200 pounds at $4.35 per hundred	8 70
Roots, 500 pounds at $5 per ton	1 25
Total cost per month	$50 60
Average cost per month per head	5 06

COST OF PORK PRODUCTION

An experiment is now under way to determine the relative value of different mixtures of feeds which are grown and easily produced in this section. Forty-eight pigs of weaning age were put into six groups of eight each, on January 1. The different groups were fed the following meal mixture:—

Group No. 1	—Screenings—	3 parts barley 1 part oilmeal	10 per cent
" " 2	"	1 part barley 3 parts oilmeal	10 " "
" " 3	"	3 parts corn 1 part oilmeal	10 " "
" " 4	"	1 part corn 3 parts oilmeal	10 " "
" " 5	Monarch hog feed.		
" " 6	Schaumacher hog feed.		

The daily meal ration was soaked with hot water twelve hours prior to feeding. An average of ten pounds of boiled roots was fed daily with the meal ration. All the hogs of groups 1 and 2 have been sold, but some of the hogs of each of the other groups are still in the feed lot.

The following is a statement of the cost of feed for groups 1 and 2:—

GROUP No. 1—FEED FROM JANUARY 1 TO MAY 15

377 pounds shorts at $3.61 per hundred	$13 60
381 pounds ground oats at 68 cents per bushel	7 51
371 pounds oilmeal at $4.35 per hundred	16 12
2,188 pounds screenings at $1.65 per hundred	36 12
758 pounds barley at $2 per hundred	15 17
1,260 pounds roots at $5 a ton	3 15
Feed for dam for six months at $5.06 per month	30 36
Total cost of feed	$122 03
Proceeds—	
495 pounds pork at 21 cents	$103 95
440 pounds pork at 20 cents	88 00
Total proceeds	$191 95
Cost of feed	122 03
Profit over cost of feed	$69 92
Cost to produce 100 pounds pork	13 05

GROUP No. 2—FEED FROM JANUARY 1 TO MAY 15

377 pounds shorts, at $3.61 per hundred	$13 60
381 pounds ground oats at 68 cents per bushel	7 51
421 pounds oilmeal at $4.35 per hundred	14 94
876 pounds screenings at $1.65 per hundred	14 45
2,521½ pounds ground barley at $2 per hundred	50 43
1,260 pounds roots at $5 per ton	3 15
Feed for dam for six months at $5.06 per month	30 36
Total cost of feed	$134 44
Proceeds—	
384 pounds pork at 21 cents	$ 80 64
536 pounds pork at 20 cents	107 20
Total proceeds	$187 84
Cost of feed	134 44
Profit over cost of feed	$53 40
Cost to produce 100 pounds pork	14 61

FIELD HUSBANDRY

The weather during the spring was favourable for seeding work, but, owing to the great depth of snow during the winter, the land was not in good condition for tillage for the main crop until the middle of May. The first sowing was done on May 18, and seeding was finished on May 27. All grains sown prior to May 24 matured well, but oats and wheat sown after that date did not mature seed properly, as the frost of 5 degrees on August 20 affected late-sown grain, the seed of which was low in germinating quality, though of good feeding value.

At present a four-year rotation is practised on the Farm: the first two years in grass and clover, third year in hoed crops, and the fourth year in grain. The meadows have not been pastured except in the fall, after the hay crops have been taken off, as the stump land has pastured the stock. After the second crop of hay, the sod is ploughed early in the fall and top dressed with manure during the winter. The large amount of humus necessary for the maximum growth of hoed crops, and peas, oats and vetches for ensilage, is furnished by the decay of the sod, and the manure; the soil after a hoed crop being left in the best possible condition for the growing of grain and the seeding down to grass and clover. A four-year rotation with two years in hay or pasture is favourable for loosening up some of our heavy clay soils, but a longer rotation, with a number of years in grass, might be adopted to advantage, as it appears that considerable red clover here is of a perennial nature, if not pastured off too closely in the fall. Close cropping in the fall has a tendency to weaken the stand of clover, so that it kills out after the first crop.

An average yield of 46 bushels of oats per acre was obtained from twenty-five acres of oats. Five acres of Daubeney oats sown on May 27 were cut for green feed, as they failed to mature good seed. Oats were sown at the rate of 2¾ bushels per acre. The soil was principally a heavy clay loam, which gave an average good yield. A few acres of muck did not give as good a crop as the clay, the crop being quite short, it having suffered considerably from drouth.

Fifteen acres of barley were grown on a clover sod that had been ploughed early the previous fall, and yielded 28 bushels per acre. The soil was principally a heavy clay loam, but parts of the field was a muck soil. Both types of soil gave a satisfactory crop of barley.

No field peas were sown except in oats, peas and vetch mixtures.

Twenty-five acres of fall wheat were sown, but it was badly winter-killed, and only yielded 7 bushels 30 pounds to the acre. The wheat was sown about September 10, which appears to be too late to give the crop a good start in the fall.

Ten acres of spring wheat were sown late in order to use it as a nurse crop for the seeding of red clover at different rates per acre. The frost of August 20 checked the maturity of the crop, which was then cut for ensilage.

The season was not favourable for a heavy production of hay, as the total precipitation for May was only 1·2 inches, and the rainfall in June was 1·4 inches. July was also dry until the middle of the month, when 2·6 inches of rain fell; but this was too late to benefit the hay crop. One hundred and ten acres in hay gave an average yield of 0·75 tons per acre. Sixty acres of this area had been closely pastured in the fall, which would tend to decrease the hay crop. Good drying weather prevailed during haying, and a good quality of hay was saved.

LAND DRAINAGE

During the season 1920, 1,955 rods of ditching were dug by a Buckeye traction digger at an average cost of 30·8 cents per rod. Forty days were required to do the work, and of this time ten days were lost by breakages and bad weather. The digging was principally through clay and clay loam. Some difficulty was experienced by the bending of the shoe supports in the rear of the digging wheel, while digging through gumbo.

Three hundred and twenty gallons of gasoline were used, at 43 cents per gallon, and 10 gallons of Polarine, at $1.19 per gallon. The wage of the operator was 55 cents per hour.

Drains were put in 60 feet apart, and at an average depth of 3 feet. Owing to unevenness in the lay of the land in some places, and in order to get a proper grade, drains were put in 4 feet deep in places, and as shallow as 2 feet in other places; but the drains at different depths were taking off the water quite uniformly in the spring.

LAND CLEARING

An experiment was commenced during the summer to determine the cost of clearing land at different dates after slashing. Five acres of timbered land were slashed and burned, at a cost of $40 per acre.

One acre was stumped and ploughed ready for crop at a cost of $75.60 per acre, and one acre will be stumped and ploughed ready for crop in each of the following four years. The stump land was seeded down with grass seed and clover, to provide pasture. It is expected that the cost of clearing land of green stumps will be much more expensive than the clearing of land after the roots of the stumps have rotted for a few years.

Seventy acres of land were stumped and burned over; the cost of this work averaged $45 per acre, leaving the land in shape for breaking, which will cost on an average $10 to $12 per acre.

FERTILIZER EXPERIMENT

An experiment was started this year to determine the effect of various fertilizers on a four-year rotation of crops. The proposed rotation was: 1st year, potatoes; 2nd year, grains, seeded down with clover; 3rd year and 4th year, hay. The soil was a loose clay loam. Fertilizers were applied on June 3, and were worked lightly into the soil just before the potatoes were planted on the same date.

The yield from potatoes, the first crop of the rotation, indicates that the greatest profit per acre was obtained from an application of 100 pounds of nitrate of soda, 200 pounds acid phosphate, 200 pounds basic slag, and 100 pounds muriate of potash.

This application gave a profit of $144 per acre over cost of fertilizers. No marked results were obtained from the use of lime in the first year of the rotation.

The following table shows the amounts of fertilizers used on each plot, yields and profits:—

FERTILIZER EXPERIMENT, 1920

RECORD OF THE RETURNS FROM THE POTATO CROP (FIRST YEAR) OF THE ROTATION.

Number of Plot	Barnyard Manure (in Tons per acre)	Ground limestone (in pounds per acre)	Fertilizers (in pounds per acre) applied 1920						Cost of fertilizers per acre	Yields per acre		Increases over Check Plots		Value of Increase per acre	Profit after deducting cost of fertilizers
			Quick lime	Nitrate of soda	Slacked lime	Acid phosphate	Basic slag	Muriate of potash		Pounds	Pounds	Pounds	Pounds		
1	Check Plot									7	200				
2							500		10 00	8	000		800	24 00	14 00
3							750		15 00	9	500	2	300	69 00	54 00
4							1,000		20 00	9	600	2	400	72 00	52 00
5	Check Plot									8	500				
6			3,000						45 00	8	400				
7					4,500				67 50	8	600		100	3 00	
8		6,000							19 80	10	500	2	000	60 00	40 20
9	Check Plot									9	560				
10			3,000				500		55 00	11	700	2	140	64 20	9 20
11			3,000				750		60 00	12	380	2	820	84 60	24 60
12			3,000				1,000		65 00	9	000	1	440	43 20	
13	Check Plot									10	160				
14				100		200	200		14 75	14	000	3	840	115 20	100 45
15				100		400			15 25	11	260	1	100	33 00	17 75
16	Check Plot									9	800				
17			3,000						55 00	9	740				
18					4,500				67 50	9	420				
19		6,000							19 80	10	000		200	6 00	
20	Check Plot									9	420				
21			3,000				500		55 00	7	820				
22			3,000				750		60 00	8	120				
23			3,000				1,000		65 00	8	260				
24	Check Plot									8	120				
25							500		10 00	11	500	3	380	101 40	91 40
26							750		15 00	9	260	1	140	34 20	19 20
27							1,000		20 00	10	300	2	180	65 40	25 40
28	Check Plot									5	100				
29				100		200	200		14 75	8	220	3	120	93 60	78 85
30				100		400			15 25	8	760	3	660	109 80	94 55
31				100		200	200	100	23 50	9	560	4	460	133 80	110 30
32			1,000	100		400			30 25	10	840	5	740	172 20	141 95
33				100		200	200	100	23 50	10	700	5	600	168 00	144 50
34			1,000	100		400			30 25	9	840	4	740	142 20	111 95

HORTICULTURE

The season was rather dry for best results with vegetables, and early fall frosts killed the sweet corn, tomatoes, squash, peppers, pumpkins and cucumbers.

YIELDS OF VARIETIES

Name of Variety	Date planted	Length of rows	Yields	Date when ready for use
Celery				
Evans Triumph	13-4-20...	30 Feet	32 lb.	3-10-20
Paris Golden	1-5-20...	30 "	20 "	1-10-20
Winter Queen	1-5-20...	30 "	17½ "	3-10-20
Giant Pascal	1-5-20...	30 "	15 "	1-10-20
White Plume	1-5-20...	30 "	9 "	2-10-20
Table Carrots				
Early Scarlet Horn	24-5-20...	30 Feet	21 lb.	9-8-20
Danvers	24-5-20...	30 "	21 "	18-8-20
Chantenay	24-5-20...	30 "	20 "	17-8-20
Improved Danvers	24-5-20...	30 "	17 "	10-8-20
Nantes Half Long Scarlet	24-5-20...	30 "	15 "	18-8-20
Cabbage				
Delicatesse	1-5-20...	30 Feet.	41 lb.	1-9-20
Extra Amager Danish	1-5-20...	30 "	39 "	30-8-20
Perfection Drumhead	1-5-20...	30 "	37 "	18-8-20
Enkhuizen Glory	1-5-20...	30 "	36 "	23-8-20
Marble, Head Mammoth	1-5-20...	30 "	36 "	23-8-20
Fottler's Improved Brunswick	1-5-20...	30 "	32 "	20-8-20
Beets				
Crimson Globe	24-5-20...	30 Feet	9 lb.	28-8-20
Black Red Ball	24-5-20...	30 "	6 "	26-8-20
Detroit Dark Red	24-5-20...	30 "	2 "	27-8-20
Crosby Egyptian	24-5-20...	30 "	2 "	18-8-20
Beans				
Davis White Wax	22-5-20...	30 Feet	12 qt.	2-8-20
Bountiful	22-5-20...	30 "	10 "	2-8-20
Wardwell Kidney Wax	22-5-20...	30 "	8 "	4-8-20
Masterpiece O-8955	22-5-20...	30 "	8 "	1-8-20
Extra Early Red Valentine	22-5-20...	30 "	8 "	3-8-20
Potatoes				
Registered Green Mountain	18-5-20...	186 Bush.	40 lb. per ac.	15-8-20
Green Mountain	18-5-20...	168 "	40 "	15-8-20
Irish Cobblers	18-5-20...	168 "	40 "	15-8-20
Spinach				
Victoria	22-5-20...	30 Feet...	17 oz.	16-7-20
Salsify				
Mammoth Sandwich Island	22-5-20...	30 Feet...	8 lb.	1-10-20
Long White	22-5-20...	30 "	6 "	1-10-20
Long White No. 8891	22-5-20...	30 "	5 "	1-10-20
Parsnips				
Hollow Crown	22-5-20...	30 Feet...	2 lb. 5 oz.	6-8-20

YIELDS OF VARIETIES—*Con.*

Name of Variety	Date planted	Length of rows	Yields	Date when ready for use
Garden Peas				
Little Marvel	22-5-20	30 Feet	22 qt.	21-7-20
Thos. Laxton	21-5-20	30 "	17 "	21-7-20
Stratagem	21-5-20	30 "	17 "	22-7-20
American Wonder	21-5-20	30 Feet	14 lb.	21-7-20
Gradus	21-5-20	30 "	13 "	11-7-20
Pioneer	21-5-20	30 "	13 "	20-7-20
Radish				
Scarlet White Tipped "Gregory"	22.5-20	30 Feet	8 lb.	25-6-20
" " " "Burpee"	22-5-20	30 "	7 "	25-7-20
" " " "D. & F."	22-5-20	30 "	7 "	25-6-20
" " " "Thorburn	22-5-20	30 "	7 "	25-6-20
Parsley				
Triple Curled	22-5-20	30 Feet	36 oz.	1-8-20
Champion Moss Curled	22-5-20	30 "	32 "	1-8-20
Double Curled	22-5-20	30 "	30 "	1-8-20
Extra Curled	22-5-20	30 "	25 "	1-8-20
Onions				
Alisa Craig	22-5-20	30 Feet	15 lb.	1-10-20
White Barletta	22-5-20	30 "	12 "	1-10-20
Australian Brown	22-5-20	30 "	8 "	1-10-20
Yellow Glove Danvers	22-5-20	30 "	6 "	1-10-20
Southport Red Globe	22-5-20	30 "	6 "	1-10-20
Lettuce				
Grand Rapids O-9512	22-5-20	30 "	32 lb.	23-7-20
Salamander "McDonald"	22-5-20	30 "	31 "	6-8-20
Black Seeded "Simpson"	23-5-20	30 "	29 "	23-7-20
Grand rapids "Summerland"	22-5-20	30 "	29 "	23-7-20
Improved Hanson "Ewing"	225—20	30 "	29 "	23-7-20

SMALL FRUITS

A number of varieties of raspberries, strawberries, currants and gooseberries have been set out, the growth of each being good; these fruits have wintered over very well. Strawberries and raspberries may be relied upon to produce good crops, and there is room for a large increase in the acreage of all small fruits, as the estimated acreage of these in Northern Ontario last year was but 343 acres.

A small orchard of tree fruits, such as hardy varieties of apples, crabs and plums, has been planted out, and has made a fairly good growth. Twenty-five per cent of the trees have been winter-killed.

ORNAMENTAL GARDENING

Many varieties of flowers were set out in the spring, but owing to drouth did not do well. Hedges of Laurel Willows and Caragana Arborescens were also set out, and made a good growth.

CEREALS

The first work on the land this year was the preparation of the plots to be sown in cereal variety tests. The seeding of the plots was done on May 10, which was the earliest seeding for the past three years. Good weather prevailed throughout May, so that conditions were favourable for the preparation of a good seed bed.

Owing to the great depth of snow that melted in the spring, there was ample moisture to ensure a good germination of the grain crops.

The cereal variety test plots were put on a piece of heavy clay loam, northeast of the farm buildings. This location was favourable, as the soil could be worked early, and it was in good physical condition, having been broken up early the previous fall from clover sod. One-twentieth-acre plots were sown in duplicate of all varieties.

SPRING WHEAT

Four varieties of spring wheat were sown in drills, at the rate of 1¾ bushels of seed per acre. Prior to sowing, the wheat was treated for smut by immersing the seed in loose sacks, for five minutes, in a solution of five quarts of water to one tablespoonful of formaldehyde, or twenty gallons water to eight ounces formaldehyde. The seed was treated the day before sowing, and spread out on a clean floor, in a thin layer, to dry.

The highest yield was obtained from Marquis, which gave 27 bushels per acre, and matured in 116 days. The straw was bright and of a good length, the grain being plump and of good size. Huron stood second, with a yield of 26 bushels per acre, and matured in the same number of days as Marquis. The straw was slightly shorter, but strong, and quite free from rust; and the grain was slightly larger than that of Marquis, but of a poor milling quality.

Prelude was the first variety to ripen, having matured in 98 days and yielded 20 bushels per acre. Ruby matured just two days later, but gave a yield of only 11 bushels per acre. The straw of these two varieties was short, inclined to lodge, and rather badly rusted, but the grain of each variety was well filled and of good quality.

OATS

Five varieties of oats were sown, at the rate of 2 bushels, 3 pecks per acre. The seed was treated with formaldehyde solution for smut, similar to the treatment given for wheat smut. All varieties made a good germination and satisfactory growth throughout the season. The drouth of June and July, however, checked the growth of Daubeney and O.A.C. No. 3 considerably, and these were short in straw. The latter part of July and August was favourable for the filling of grain, and no rust or smut affected any variety. Banner gave the highest yield, and Daubeney, which was the first to ripen, gave the lowest.

BARLEY

Three varieties of barley were tested in duplicate plots. Seed was sown at the rate of two bushels per acre. The soil was a heavy clay loam, lacking somewhat in fertility. Under these conditions, Duckbill, the only two-rowed variety, gave the highest yield. This variety had the greatest length of straw and the longest head, and would be well suited to heavy clay soils lacking in humus and fertility. Albert ripened twelve days earlier than the other varieties, and would be well suited for late sowing. It had the shortest straw and the shortest head, and would do best in a rich soil.

VARIETY TESTS OF CEREALS

Number	Variety	Date of Sowing	Date of Ripening	Number of days maturing	Average length of Straw	Strength of Straw on scale of 10 points	Average length of Head	Yield of Grain per acre	Yield of Grain per acre
					inches		inches	lbs.	bush. lbs.
	Oats—								
1	Banner	May 10	Sept. 4	117	39	10	8	1,982	58 10
2	Victory	" 10	" 4	117	37	10	7·5	1,880	55 10
3	O.A.C. 72	" 10	" 7	120	39	10	7·8	1,720	50 20
4	O.A.C. 3	" 10	" 28	110	31	9	6·5	1,462	43
5	Daubeney	" 10	Aug. 27	109	30	9	6·3	1,122	33
	Barley—								
1	Duckbill	May 10	Aug. 28	110	36	10	4·0	1,363	28 19
2	O.A.C. 21	" 10	" 28	110	30	9	3·8	1,104	23
3	Albert	" 10	" 16	98	28	9	3·2	902	18
	Wheat—								
1	Marquis	May 10	Sept. 3	116	36	10	3·2	1,638	27 18
2	Huron	" 10	Sept. 3	116	35	10	3·1	1,560	26
3	Prelude	" 10	Aug. 16	98	29	7	2·6	1,200	20
4	Ruby	" 10	Aug. 18	100	27	7	2·5	660	11 18

FORAGE CROPS

The season was favourable for the growth of forage crops. There was plenty of soil moisture in the spring to insure good germination, with the exception of mangels, which were sown on May 24, at the commencement of the dry weather.

OATS, PEAS AND VETCHES

The principal forage crop grown for ensilage was a mixture of oats, peas and vetches, sown at the rate of 1 bushel oats, 1 bushel peas and ½ bushel vetches per acre. Twenty-five acres of this crop were sown, partly on clover sod and partly first crop on new breaking.

The yield varied with the character and fertility of the soil. Well manured clay soil gave a yield of 9 tons, 1,260 pounds per acre, and unmanured muck land gave only half that yield. Peas and vetches did not thrive on the muck soil, and the oats were short in straw.

The peas, oats and vetch mixture gave the most satisfactory ensilage crop for the season, as it was only slightly affected by frost in the fall.

SUNFLOWERS

Fifteen acres of sunflowers were sown in drills 36 inches apart, and thinned to six inches apart in the drills. Frequent surface cultivation was given, to control weeds and maintain soil moisture. Part of the crop was sown near the river on average clay soil, and yielded 8 tons 900 pounds per acre, and was only slightly injured by frost. Ten acres sown a considerable distance from the river was quite badly frozen on August 20. The portion grown on muck land was more severely frozen than that grown on clay soil. All the crop was put into the silo, and made good ensilage which was relished by the stock. The sunflower ensilage was more watery than that from the O.P.V. mixture, as very few of the sunflowers had matured sufficiently to form seed.

CORN FOR ENSILAGE

Four varieties of ensilage corn were grown on one-fortieth-acre plots, and also in acre plots, but all made a very poor growth, and by the middle of September were so short that the crop was not worth cutting.

TURNIPS

Thirty-two varieties of turnips were grown in one-twentieth-acre plots in duplicate. Seed was sown on June 14, and made a good germination. A new variety known as "Ditmars," the seed of which was produced at the Kentville Experimental Station, was the highest in yield. It was also one of the best in shape and quality, as it was very smooth and round, and very fine grained.

VARIETY TEST—TURNIPS

Numbers	Name of Variety	Yields per acre			
		Tons	Pounds	Bush.	Pounds
1	Ditmars "Kentville"	17	350	572	30
2	Champion "Charlottetown"	12	550	409	10
3	Green Top "Kentville"	11	1,450	390	50
4	Invicta Bronze Top "Ewing"	11	1,450	390	
5	Hall's Westbury "McDonald"	11	650	377	30
6	Hall's Westbury "Bruce"	11	150	369	10
7	Hall's Westbury "Ewing"	10	1,900	365	
8	Good Luck "Fredericton"	10	600	343	20
9	Sutton's Magnum Bonum "McDonald"	10	50	334	10
10	Canadian Gem "Kentville"	9	1,800	330	
11	Perfection "Steele Briggs"	9	1,650	327	30
12	Elephant "Ewing"	9	1,050	317	30
13	Monarch "Nappan"	9	1,050	317	30
14	Mammoth Clyde Purple Top	9	800	313	20
15	Prize Elephant "McDonald"	8	1,900	298	20
16	Perfecta Swede "McDonald"	8	1,550	297	30
17	Prize Purple Top "Rennie"	8	1,350	280	10
18	New Perfection "Bruce"	8	1,200	286	40
19	Selected Purple Top "Bruce"	8	1,100	285	
20	Hartley's Bronze Top "McDonald"	8	550	275	50

CARROTS

Fifteen varieties of carrots were planted on June 7 and all made a good germination. The soil was a lose silt which dried out considerably during the summer As a result the yield was light.

VARIETY TEST—CARROTS

Numbers	Name of Variety	Yields per Acre			
		Tons	Pounds	Bush.	Pounds
1	Champion White Intermediate "Ewing"	2	1,000	83	20
2	Mammoth White Intermediate "Rennie"	2	1,000	83	20
3	Large White Belgian "Rennie"	2	700	78	20
4	Long Orange Belgian "Rennie"	2	300	71	40
5	Large White Belgian "Steele Briggs"	2	200	70	
6	Giant White Belgian "Ewing"	2	200	70	
7	Improved short White "Steele Briggs"	2	.....	66	40
8	Danish Champion "McDonald"	1	1,500	58	20
9	Improved Danvers "McDonald"	1	1,200	53	20
10	Long Orange or Red Surrey "Steele Briggs"	1	1,200	53	20
11	Large White Vosges "McDonald"	1	900	48	20
12	Large White Vosges "Bruce"	1	800	46	40
13	Intermediate Scarlet "Bruce"	1	400	40	
14	Long Orange "Bruce"	1	300	38	20
15	New Yellow Intermediate	1	500	41	40

TIMOTHY AND CLOVER SEEDING

The hay crop of northern Ontario is an important one, as 45·3 per cent, or 190,098 acres of the 419,427 acres of cleared land is now producing hay. As timothy, red clover and alsike have been principally grown for hay production, an experiment was commenced to test different rates of seeding of timothy and clover mixtures for hay. Ten plots were sown on heavy clay loam that had produced a crop of turnips the previous year, and hence was in good condition for seeding down. The grass

and clover seeding made an excellent growth, and by fall some of the red clover was in bloom. Duplicate plots were sown on muck soil, on new land, which had not been manured. The timothy in these plots made a fair growth, but alsike and red clover were almost a failure. The following amounts of seed were sown on each plot:—

Plot No. 1—

Timothy	8	pounds per acre
Red clover	10	" " "

Plot No. 2—

Timothy	8	pounds per acre
Red clover	8	" " "
Alsike	2	" " "

Plot No. 3—

Timothy	8	pounds per acre
Red clover	6	" " "
Alsike	3	" " "

Plot No. 4—

Timothy	8	pounds per acre
Red clover	4	" " "
Alsike	4	" " "

Plot No. 5—

Timothy	8	pounds per acre
Red clover	2	" " "
Alsike	5	" " "

Plot No. 6—

Timothy	6	pounds per acre
Red clover	10	" " "

Plot No. 7—

Timothy	6	pounds per acre
Red clover	8	" " "
Alsike	2	" " "

Plot No. 8—

Timothy	6	pounds per acre
Red clover	6	" " "
Alsike	3	" " "

Plot No. 9—

Timothy	6	pounds per acre
Red clover	4	" " "
Alsike	4	" " "

Plot No. 10—

Timothy	6	pounds per acre
Red clover	2	" " "
Alsike	5	" " "

GRASSES WITH CLOVERS AND ALONE FOR HAY PRODUCTION

To test the value of various grasses grown with clovers and alone for hay production, an experiment was commenced by seeding twenty-four plots of one-fortieth acre each, sown in duplicate. Twenty-four plots were sown with a nurse crop of barley, at the rate of one bushel per acre, and twenty-four plots were sown without a nurse crop. The plots were sown on virgin clay loam that had been summer-fallowed and top dressed with manure during the winter. There was a good germination of grasses and clovers, and all had made a good growth except orchard grass, which was uneven in appearance.

Duplicate plots were sown as follows:—

No. of plot	1	Red clover	10	pounds	per acre
		Timothy	8	"	" "
" " "	2	Red clover	10	"	" "
		Meadow fescue	15	"	" "
" " "	3	Red clover	10	"	" "
		Orchard grass	15	"	" "
" " "	4	Red clover	10	"	" "
		Timothy	6	"	" "
		Meadow fescue	10	"	" "
" " "	5	Red clover	10	"	" "
		Timothy	6	"	" "
		Orchard grass	10	"	" "
" " "	6	Red clover	10	"	" "
		Meadow fescue	10	"	" "
		Orchard grass	10	"	" "
" " "	7	Alsike clover	6	"	" "
		Timothy	8	"	" "
" " "	8	Alsike	6	"	" "
		Orchard grass	15	"	" "
" " "	9	Alsike	6	"	" "
		Meadow fescue	15	"	" "
" " "	10	Alsike	6	"	" "
		Timothy	6	"	" "
		Meadow fescue	10	"	" "
" " "	11	Alsike	6	"	" "
		Timothy	6	"	" "
		Orchard grass	10	"	" "
" " "	12	Alsike	6	"	" "
		Meadow fescue	10	"	" "
		Orchard grass	10	"	" "
" " "	13	Red clover	8	"	" "
		Alsike	2	"	" "
		Timothy	8	"	" "
" " "	14	Red clover	8	"	" "
		Alsike	2	"	" "
		Meadow fescue	15	"	" "
" " "	15	Red clover	8	"	" "
		Alsike	2	"	" "
		Orchard grass	15	"	" "
" " "	16	Red clover	8	"	" "
		Alsike	2	"	" "
		Timothy	6	"	" "
		Orchard grass	10	"	" "
" " "	17	Red clover	8	"	" "
		Alsike	2	"	" "
		Timothy	6	"	" "
		Orchard grass	10	"	" "
" " "	18	Red clover	8	"	" "
		Alsike	2	"	" "
		Meadow fescue	10	"	" "
		Orchard grass	10	"	" "
" " "	19	Timothy	12	"	" "
" " "	20	Meadow fescue	30	"	" "
" " "	21	Orchard grass	30	"	" "
" " "	22	Timothy	8	"	" "
		Meadow fescue	15	"	" "
" " "	23	Timothy	8	"	" "
		Orchard grass	15	"	" "
" " "	24	Meadow fescue	15	"	" "
		Orchard grass	15	"	" "

RED CLOVER SEED PRODUCTION

The production of clover seed is becoming an important branch of farming in many sections of northern Ontario, as soil and climate are well suited for the production of seed of the highest quality. To test methods of growing clover for seed, five ½-acre plots were sown in duplicate, with a nurse crop of spring wheat, on virgin clay soil.

Seed on plot No. 1 was sown broadcast at the rate of eight pounds per acre. Two cuttings from this plot to be taken for hay.

Plot No. 2 was sown broadcast at the rate of eight pounds per acre. The first cutting to be taken for hay, and the second for seed.

Plot No. 3 was sown broadcast at the rate of eight pounds per acre. The first crop to be left for seed production.

Plot No. 4 was sown in rows twelve inches apart. First crop left for seed.

Plot No. 5 was sown in rows twenty-four inches apart. First crop for seed.

All plots made a good growth the first season, those sown broadcast being apparently the more promising.

ALSIKE CLOVER SEED PRODUCTION

An experiment with alsike seed production was also commenced by sowing three half-acre plots in duplicate at different rates of seeding; but as this seed was sown late, and dry weather set in, much of the seed failed to germinate, so that no reliable results could be obtained from these plots.

TIMOTHY SEED PRODUCTION

Four half-acre plots of timothy were sown in duplicate on muck soil, to test different methods of seeding for the production of timothy seed. Oats were sown as a nurse crop at the rate of two bushels per acre.

Plot No. 1 was sown broadcast at the rate of eight pounds per acre of timothy and ten pounds of red clover.

Plot No. 2 was also sown broadcast at the rate of ten pounds timothy per acre.

Plot No. 3 was sown with timothy in drills twelve inches apart, and plot No. 4 was sown in drills twenty-four inches apart.

The clover in plot No. 1 did not make a good growth, but the timothy in all plots did uniformly well.

ALFALFA SEEDING WITH INOCULATION AND LIME

As yet there is very little alfalfa grown in northern Ontario. Last year the estimated acreage was only 171 acres, out of a total of 190,098 acres in hay. Although the season was very dry and quite unfavourable for hay production, the average yield of alfalfa was 1·9 tons per acre. This was 1,000 pounds per acre greater than the average yield of hay, which was 1·4 tons per acre.

An experiment was commenced this year to determine the the best method of seeding alfalfa for hay production. Four half-acre plots of naturally well-drained, heavy clay were sown with Grimm alfalfa. Each plot was given an application of air slacked lime, at the rate of two tons per acre. Prior to sowing, the seed was treated with nitro culture to inoculate the seed with alfalfa bacteria.

Plot No. 1 was sown broadcast at the rate of twenty pounds of alfalfa seed per acre, and with a nurse crop of barley sown at the rate of one bushel per acre. The alfalfa on this plot suffered from drouth and made a weak growth.

Plot No. 2 was sown broadcast at the rate of twenty pounds seed per acre, without a nurse crop. This plot made a very good growth throughout the season, and withstood the drouth much better than plot No. 1.

Plot No. 3 was sown in drills twelve inches apart, with a nurse crop of one bushel barley per acre, which had a drying effect on the plot similar to plot No. 1. This resulted in a poor stand of alfalfa.

As the plots were seeded on a dry clay knoll the results of the seeding of these plots indicate that better results may be expected from seeding alfalfa without a nurse crop than with one, on dry knolls or any soils lacking in moisture.

BEES

During the year a bee house was constructed for the storing of bee supplies, and a bee yard was fenced in with a board fence nine feet high, as a windbreak for the protection of the colonies of bees. Two colonies of bees were wintered in the cellar, and came through in good condition. In the spring the two colonies were placed in the bee yard, and one colony was placed on a scale, a daily record of the weight being kept. No trouble was experienced with swarming, as this was controlled by cutting out the queen cells, and plenty of room was given for brood and stores by the addition of supers when necessary. Ample ventilation was provided during swarming season. One colony was twice divided, and an imported queen introduced to each of the new colonies. The two new colonies were united in the fall. The dividing of the bees to increase the number of colonies meant, of course, a decrease in the production of honey.

PROFITS FROM COLONIES

110 pounds extracted honey at 33·5 cents per pound	$36 85
Value of one colony increase	7 00
Total proceeds	$43 58

EXPENDITURE

50 pounds sugar for fall feeding	$10 35
Profit on honey produced	33 23
Average value of honey production per colony, spring count	16 61
Average value of increase per colony, spring count	3 50

IMPROVEMENTS

A new piggery was fitted up from a building purchased and moved from the former internment camp. This building has accommodation for seventy-five hogs, and is giving much-needed room.

A new oil house was erected for the storage of kerosene and gasoline.

An apiary building 16 feet by 24 feet, with a bee yard, was constructed early in the spring.

A double house was remodelled from a large bungalow formerly owned by Internment Operations. This building will be used for the accommodation of farm employees.

EXHIBITIONS

An exhibit consisting of models of buildings, and equipment for live stock and poultry, was prepared at the Central Experimental Farm, Ottawa, and shown with an exhibit of threshed grains, grasses, sheaves of grain, vegetables, etc., etc., from this Station. The fairs visited were New Liskeard, Cochrane, Thessalon, Sault Ste. Marie and Fort William. Great interest was taken in the models exhibited, and in the samples of grain, which were of the most productive and most suitable varieties. The products from this Station demonstrated the possibilities of crop production in northern Ontario.

EXPERIMENTAL STATION, LA FERME, QUE.

REPORT OF THE SUPERINTENDENT, PASCAL FORTIER

THE SEASON

As the attached meteorological table will show, the 1920-21 season was, on the whole, an excellent one from the agricultural viewpoint, it being the first one in which grain really ripened here since the Experimental Station at La Ferme came into existence. The grain was seeded from May 15 on, made excellent growth (though later it suffered somewhat from drought) and was harvested during excellent weather, in the latter end of August. Snow came, to stay for the winter, on October 27.

METEOROLOGICAL REPORT, 1920-21

Month	Temperature F.			Precipitation			Hours of Sunshine
	Mean	Maximum	Minimum	Rain Inches	Snow Inches	Total	
1920.							
April	35·8	57	8	0·30	.....	0·30	129·1
May	56·1	83	29	1·17	.....	1·17	233·2
June	58·3	83	35	0·81	.....	0·81	287·3
July	58·4	82	32	2·84	.....	2·84	220·4
August	62·2	87	37	3·78	.....	3·78	250·0
September	54·6	83	31	2·71	.....	2·71	175·9
October	45·3	68	10	1·87	3·00	2·17	120·7
November	19·0	38	-12	.....	6·00	0·6	38·9
December	10·2	39	-40	0·55	1 4·3	1·98	45·2
1921.							
January	2·7	38	-40	.....	19·5	1·95	91·8
February	-3·8	43	-36	.....	12·0	1·2	124·4
March	15·7	57	-25	.....	45·5	4·55	101·6
Total	.....	.....	.....	14·03	100·3	24·06	1,818·85

ANIMAL HUSBANDRY

DAIRY CATTLE

The herd comprises twelve head of grade Ayrshires and Holsteins. There are seven milch cows, four heifers of ages varying from a few days to eleven months, and one pure-bred Ayrshire bull. The ehifers are kept in order to demonstrate that the use of a pure-bred bull ensures a fairly uniform and profitable herd. It is not yet possible to furnish production figures for the progeny, which but recently freshened, but it will be interesting in the future to ascertain whether the newcomers fill the pail as efficiently as their dams or their aristocratic, pure-bred, registered sisters.

Yields of cows having completed lactation during the year are given in table A.

TABLE A

Name of cow	Number of cow	Date of calving	Duration of lactation	Total milk production during lactation period	Average daily milk yield	Value of milk at $3.20 per 100 pounds	Quantity of grain fed at $62.50 per ton	Quantity of roots fed at $6.75 per ton	Quantity of ensilage at $10 per ton	Quantity of hay fed at $37 per ton	Pasture at $1 per month	Total cost	Cost of production for 100 pounds of milk	Profit on 100 pounds of milk	Net profit between calvings (labour and manure omitted)
				lbs.	lbs.	$ cts.						$ cts.	$ cts.	$ cts.	$ cts.
Doucette.....	H. 1	June 24, 1920.....	280	8,539	30·5	273 24	3 046·5	1,568	4,581	2,447·5	4¾	173 33	2 03	1 17	99 81
Lillian.....	A. 3	May 1, 1920.....	304	8,010	26·3	256 32	2,016	1,568	3,380	2,155	4¾	139 19	1 74	1 46	117 13

Cost of feed given in above table includes feed used during the period when the cows were giving no milk. Yield of cow No. 1 would doubtless have been higher if milk fever had not set in following calving, and if, three months prior to completing her lactation, she had not been afflicted with a blind teat, followed by inflammation and drying off of one quarter.

COST OF RAISING HEIFERS

Table B contains figures relative to raising of dairy heifers. The whole milk and skim-milk are valued at $3.20 and 35 cents per cwt. respectively; meal, hay and ensilage, $66, $35 and $10 per ton respectively; and pasture, 75 cents per month.

TABLE B.

Name of Heifer	Dropped	Date of first calving	Whole milk fed at $3.20 per cwt.	Skim-milk fed at 35c. per cwt.	Meal fed at $66 per ton	Hay fed at $35 per ton	Ensilage fed at $10 per ton	Pasture at 75c. per month	Total cost
Blanche No. 8	Aug. 24, 1919	May 8, 1921	320	1,423	401	2,704	4,771	5	$103.37
Bella No. 9	June 18, 1920	.....	180	937	765	813	1,286	½	55.13

The cost of raising a heifer to her first calving, which occurred at the age of 20½ months, was $103.27. This heifer was bred by accident, for the first calving in heifers before the age of 2½ years is not recommended. The cost of raising heifer No. 9 to the age of one year was $55.13. Prices for feed are those prevailing in the region.

SWINE

On April 1 there were at the Station four brood sows; eight hogs were being fattened; and in addition there were six young pigs, the cost of raising which is being recorded—all of the Yorkshire breed. Records were kept of the feed received by the six young pigs, in order to determine the cost of production per 100 pounds of meat. The experiment being incomplete, figures are not yet available.

HORSES

There are, on the Station, nine draught horses and two road horses. No experiment was carried on, but the cost of maintenance was compiled from September 6, 1919 to February 26, 1921. The cost of feeding a draught horse during 365 days was $298.99, or 81·9 cents per day. Hay and straw were valued at $35.50 and $10 per ton respectively; oats, bran and molasses at $2.80, $2.25 and $5 per cwt. respectively. (Labour and depreciation are not included in above figures).

SHEEP

The Station possesses twenty-seven cross-bred ewes and one registered Cheviot ram. The lamb crop this spring was 32, a yield of 118 per cent. Within a few generations it will be ascertained to what extent it is possible to improve quality and uniformity in a flock of common sheep. All the feed given to the lambs is recorded, in order to ascertain the cost of raising.

CEREALS

The season of 1920 was one of the best since the Station was established. Seeding was delayed by wet weather until May 15, but from that date this operation was performed without difficulty. The grain made a good growth at the outset, but suffered later on from the drought; rainfall during May and June was 1·17 and 0·81 inches respectively. For the first time since the inception of the farm, grain ripened, and the fall weather was favourable for harvesting.

Thirty acres were seeded to oats, one to spring wheat, three to barley and one to peas, which gave yields of 20, 12, 15 and 7 bushels per acre respectively. One hundred and twenty bushels of oats were kept for seed, as well as ten bushels of barley and two of peas, which will be sown this spring.

It is intended to prepare the land for cereal experiments in the near future. At the present time, owing to a moderately uniform and progressive amelioration of temperature, the cultivation of Banner oats and Marquis wheat, which ripen well and yield more heavily than the earlier varieties, might be recommended.

FIELD HUSBANDRY

The season of 1920 was a good one for the farmers of the Abitibi. Spring, although late, was very favourable to seeding operations, which began about May 15; haying was started around the middle of July; and grain harvesting about the end of August. The first snowfall occurred on October 27, and remained on the ground, which did not freeze before winter.

It is interesting to note the amelioration in the temperature during the past few years, alluded to above. Temperature seems to range higher, with somewhat less moisture as clearing progresses. During 1918 the thermometer fell below 32 degrees F. every month except July. In 1919 there was no frost from June 28 to September 10; and in 1920, from July 1 to September 19. The July frost did practically no injury. Winter was fairly cold, the thermometer falling to 40 degrees below zero in December and January, 36 degrees below in February, and 25 degrees below in March. The mean temperature for February was 3·8 degrees below zero.

FIELD CROPS

The following crops were grown this year:—

Oat and pea ensilage	45 tons
Swede turnips	15 "
Hay	32 "
Oats	700 bush.
Wheat	12 "
Peas	7 "
Barley	45 "

Ensilage.—About twenty acres were seeded to peas and oats for ensilage. Peas and oats were used because corn does not give a profitable growth owing to late spring and early fall frosts. However, sunflowers are being tried as a substitute, they being hardier and giving a higher yield. The frosts of July 1 and September 19 did not injure them.

Roots.—Growth of roots was delayed by drought from June to mid-July. Mangels and field carrots were a complete failure. Swede turnips resisted the drought better, and gave a crop somewhat below the average.

Hay.—The hay crop was fair, owing to the June drought. Average yield was slightly less than one ton per acre.

Grain.—Despite the summer drought, the crop this year was the best ever obtained. Grain sown early was more resistant to the drought.

EXPERIMENTAL CULTURE OF SUNFLOWERS

Experiments have been undertaken to determine at what distance it is best to sow sunflower seed, between the rows and in the row. Results are not yet conclusive, as the experiments have been under way only one year. Details are given in table D. The future will reveal what method of planting will give the best yield. The result for one year seems to favour a distance of from thirty-six to forty-two inches between the rows.

TABLE D

Method of Planting	Date of Sowing	Ready to cut	Yield per acre
In rows 24 inches between rows, 6 inches between plants.....	7 June.....	25 Sept.....	3,456 lbs.
In rows 24 inches between rows, 12 inches between plants.....	7 June.....	25 Sept.....	7,968 lbs.
In rows 30 inches between rows, 6 inches between plants.....	7 June.....	25 Sept.....	11,104 lbs.
In rows 30 inches between rows, 12 inches between plants.....	7 June.....	25 Sept.....	5,584 lbs.
In rows 36 inches between rows, 6 inches between plants.....	7 June.....	25 Sept.....	15,040 lbs.
In rows 36 inches between rows, 12 inches between plants.....	7 June.....	25 Sept.....	13,840 lbs.
In rows 42 inches between rows, 6 inches between plants.....	7 June.....	25 Sept.....	14,480 lbs.
In rows 42 inches between rows, 12 inches between plants.....	7 June.....	25 Sept.....	15,328 lbs.

LAND CLEARING

Some five acres of land were cleared during the year under review. Fire having done the greater part of the work on the standing timber, it remained merely for the men on the Station to gather the roots and burn them. Carefully controlled fire, started and carried through under approved methods, has done a great deal of useful work on from seventy-five to eighty acres of the Station land, which will be ready for final clearing this spring. This firing method is considered to be the best all around for clearing, it being the most economical, entailing as it does a minimum of manual labour. A special permit has, of course, to be obtained before starting any bush fire, and certain regulations have to be conformed to regarding proper supervision and control. Farmers in the district should bear this in mind. It will be found advantageous to set fire, successively, each year during the dry season, to fresh sections. After an area has been burnt over there is practically nothing left to do but gather the stumps and roots by hand. Frequently there are only a few stumps left which it will be found necessary to pull with a team of horses. During the year 1921-22 exact records of the cost of clearing by this fire method will be kept.

HORTICULTURE

Generally speaking, the season was fairly good for horticulture. The frost of July 1 injured tomatoes and beans, greatly delaying their growth, but it was possible to pick a few ripe tomatoes and some beans. The June drought greatly delayed the general growth.

FRUITS

Apples.—Since apple trees were planted at La Ferme, the growth of each year has been frozen, and the trees are not more advanced than when planted in 1917.

Last fall, the foot of each of the trees was covered with straw in order to delay circulation of sap in the spring. Next season will witness the effect of this protection.

Small Fruits.—Many varieties of black, red and white currants, gooseberries and raspberries are being tried. It was necessary to replant last fall on other soil, and as there has been no crop yet to speak of, it is impossible to make any statement concerning their respective merits.

VEGETABLES

Beans.—Seventeen varieties of beans were tried in 1920, but as they were injured by the frost, it is impossible to indicate the value of each variety.

Beets.—Nine varieties were tried in 1920. Results are given below.

VARIETY TEST—BEETS

Varieties	Origin of seed	Number of days from sowing until ready to eat	Position regard to production
Crimson Globe	McDonald..	114	1
Detroit Dark Red	O-8886.....	114	2
Eclipse	McDonald..	114	3
Early Novel	D and F....	114	4
Crosby Egyptian	Harris.....	114	5
Black Red Ball	Burpee.....	114	6
Early Wonder	McDonald..	114	7
Detroit Dark Red B	O-886.....	114	8

Cabbage.—Sixteen varieties were tried, but many died in the hotbed. See table.

VARIETY TEST—CABBAGE

Varieties	Origin of seed	Number of days from sowing until ready to eat	Position with regard to production
Drumhead Savoy	Ewing.....	136	1
Fottler's Impr'd Brunswick	Ewing.....	120	2
Enkhuisen Glory	Ewing.....	118	3
Delicatesse	Ewing.....	141	4
Succession	Ewing.....	135	5
Marblehead Mammoth	Ewing.....	135	6
Danish Ballhead	Graham....	135	7

VARIETY TEST—CARROTS

Varieties	Origin of seed	Number of days from sowing until ready to eat	Position with regard to production
Danvers	Kentville...	84	1
Chantenay	O-8885.....	84	2
Early Scarlet Horn	D and F....	84	3
Impr'd Nantes	D and F....	83	4
Impr'd Danvers Half L	D and F....	84	5

Celery.—Celery grows very well in this region. Trials during two years show that White Plume is the earliest and Winter Queen the most productive.

VARIETY TEST—CELERY

Varieties	Origin of seed	Number of days from sowing until ready to eat	Position with regard to production
Giant Pascal	McDonald	174	1
Winter Queen	McDonald	179	2
White Plume	Graham	170	3
Evans' Triumph	Burpee	179	4
Paris Golden Yellow	Graham	174	5

Corn.—It has been impossible to harvest corn here. Every year it freezes.

VARIETY TEST—LETTUCE

Varieties	Origin of seed	Number of days from sowing until ready to eat	Position with regard to production
Trianon Cos	D and F	49	1
Grand Rapids	Summerland.	52	2
Black Seeded Simpson	Bruce	49	3
Iceberg	Thorburn	49	4
Grand Rapids	O-9512	49	5
Hansen	Thorburn	49	6
Salamander	Graham	53	7

Onions.—Onions were a complete failure in 1920, due to white maggots.

VARIETY TEST—PARSNIPS

Varieties	Origin of seed	Number of days from sowing until ready to eat	Position with regard to production
Hollow Crown	O-9335	122	1

Peas.—Good yield. Laxtonian most productive; Sutton Excelsior and Early Morn earliest.

VARIETY TEST—PEAS

Varieties	Origin of seed	Number of days from sowing until ready to eat	Position with regard to production
Laxtonian	Graham	73	1
English Wonder	C.E.F.	73	2
Early Morn	Gregory	71	2
Little Marvel	Graham	72	3
Telephone	Bruce	72	4
Gregory Surprise	Gregory	72	5

Varieties	Origin of seed	Number of days from sowing until ready to eat	Position with regard to production
Pioneer	Gregory	72	6
Gradus	Carter	73	7
American Wonder	Bruce	73	7
Advancer	Bruce	73	8
Sutton Excelsior	Harris	71	9
Eight Weeks	Carter	73	10
Stratagem	Carter	72	11

VARIETY TEST—SALSIFY

Varieties	Origin of seed	Number of days from sowing until ready to eat	Position with regard to production
Long White	Ewing	107	1
Long White	O-8891	107	2
Mammoth Sandwich Island	O-9271	107	3

VARIETY TEST—TURNIPS

Varieties	Origin of seed	Number of days from sowing until ready to eat	Position with regard to production
Red Top Striped Leaf	McDonald	94	1
Early Snowball	McDonald	94	2
Golden Ball	McDonald	72	3
Extra Early Purple Milan	McDonald	94	4

POULTRY

The poultry division on this station is being organized. A permanent house has been built for 100 hens, and four colony houses, and 97 Barred Plymouth Rocks have been purchased, the number of birds of this breed being now 117. Two incubators and two brooders have been bought. Breeding will be commenced in the spring, and a few experiments conducted on incubation, breeding and housing of layers.

EXHIBITION WORK

Some horticultural products were exhibited, as well as seed grain, etc., at the Amos local fair, and these were greatly admired by many visitors.