DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
DOMINION EXPERIMENTAL FARMS

EXPERIMENTAL STATION

FREDERICTON, N.B.

REPORT OF THE SUPERINTENDENT

C. F. BAILEY, B.S.A.

FOR THE YEAR 1924

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DOMINION EXPERIMENTAL STATION, FREDERICTON, N.B.

REPORT OF THE SUPERINTENDENT, C. F. BAILEY, B.S.A.

SEASONAL NOTES

The fall of 1923 was mild. The total precipitation from October 1 until the land froze on December 15 was 8.7 inches; thus the soil and subsoil were well saturated.

The total snowfall in December was 17.75 inches, of which 14 inches fell on the 29th and 30th. During January, February and March 51.5 inches of snow fell. Owing to rainfall on four days in January, the snow did not drift. The land was evenly covered with snow until the middle of March when the sun removed the snow from the hills. During the month of April, 25 inches of snow fell, the last fall being on April 21. The snow disappeared entirely on April 23.

The moderate depth of snow and freedom from extremes of temperature were very favourable to the orchard, bush fruit and newly seeded land, all of which came through the winter with practically no winter killing.

Owing to the heavy fall of snow in April, the land dried slowly and spring operations were delayed. Ploughing was begun on the 3rd day of May as compared with April 11 in 1921, April 17 in 1922, and May 10 in 1923. The dates of first planting were as follows: Wheat, May 14; potatoes, May 16; barley and oats, May 17; turnips, May 20; corn and sunflowers, May 23. Most of the fields, however, were too wet to work until June.

June and the first seventeen days of July were very dry. This condition favoured farm operations but the crops made very poor growth. This resulted in a light crop of hay and straw. For the rest of the season growing conditions were excellent and good crops of grain, potatoes, corn, sunflowers, vegetables, apples and bush fruit were harvested.

October was the driest on the Station's records. The rainfall was 1.77 inches below the average for the last twelve years. Only 1.7 inches of rain fell from the 1st of October until the ground froze on November 17, therefore the soil and subsoil were rather dry. The St. John river froze on November 19 as compared with December 18 the previous year. December was colder than the average, the mean temperature was 3.12 degrees below the mean for the preceding twelve years.

METEOROLOGICAL RECORD AT FREDERICTON, N.B.

Month	Temperature F.					Precipitation					Bright sunshine
	Mean	Highest		Lowest		Rainfall		Snowfall		Total	
	°	date	°	date	°	days	inches	days	inches	inches	hours
January	13·2	12	46·0	27	−23·0	4	0·94	8	29·5	3·89	117·65
February	11·09	27	39·0	10	−19·0	.....	.....	4	10·0	1·00	163·05
March	29·75	23	49·0	2	− 7·0	4	0·43	5	12·0	1·63	104·45
April	37·0	27	58·5	4	10·5	9	1·49	7	25·0	3·99	138·85
May	50·46	18	74·0	10	29·0	12	2·82	.....	.....	2·82	205·80
June	59·74	24	84·0	3	38·0	9	1·69	.....	.....	1·69	237·85
July	66·2	9	88·0	15	41·0	8	2·18	.....	.....	2·18	275·35
August	64·3	6	86·0	4	42·0	11	4·33	.....	.....	4·33	208·85
September	54·9	2,28	75·0	26	32·0	10	3·69	.....	.....	3·69	186·90
October	46·24	11	70·0	31	18·0	7	1·26	.....	.....	1·26	189·40
November	36·0	12	63·5	19	4·0	5	1·15	2	10·0	2·15	97·55
December	15·9	8	37·5	29	−23·0	8	1·17	6	11·0	2·27	106·85
Totals	.....	.....	.....	.....	.....	82	21·15	32	97·5	30·9	2,028·55
Totals for five growing months	.....	.....	.....	.....	.....	50	14·71	.....	.....	14·71	1,114·75

ANIMAL HUSBANDRY

The general health of the animals has been excellent. The dairy herd has been fully accredited since February, 1923.

DAIRY CATTLE

The number of cows December 31, 1924, totalled eighty-four head and consisted of the following:—

PURE-BRED STOCK

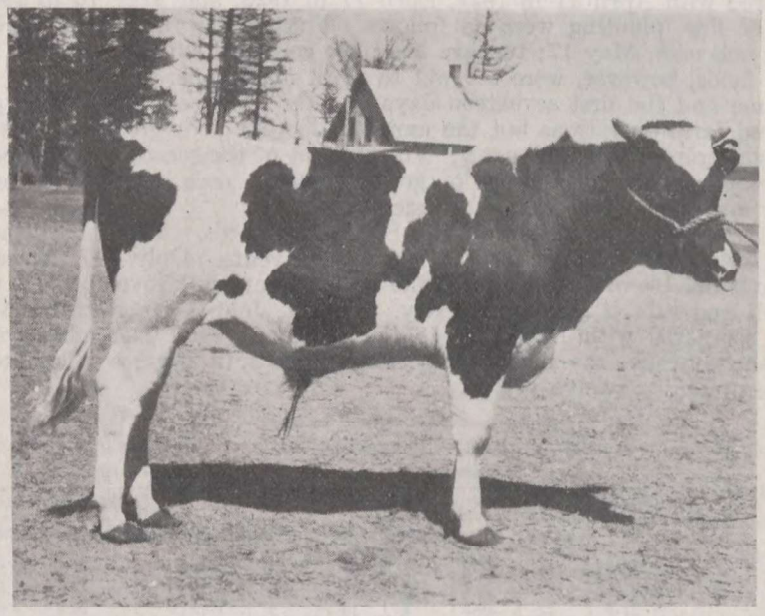
Ayrshires	8	milch cows,	14	heifers,	2	bulls, 1 steer
Holsteins	8	"	9	"	3	"
Shorthorns	8	"	12	"	1	" 2 steers

GRADE STOCK

15 heifers of mixed breeding

During the year fifteen grade heifer calves of mixed breeding were purchased for experimental purposes. Eight animals were transferred to the Station. Seventeen animals, three of which were bulls, were sold for breeding purposes.

AYRSHIRES.—The herd contained no outstanding individual. Three cows qualified in the Record of Performance. The present herd sire, Ravenwood Victor, was transferred to this Station from Charlottetown in August, 1924.



May Echo Alcartra Plus—54997—Holstein herd sire, Fredericton Experimental Station.

HOLSTEINS.—Four cows qualified in the Record of Performance with records of over 15,000 pounds of milk. The present herd sire, May Echo Alcartra Plus, was obtained from F. R. Mallory. This sire is a fine individual and his calves are exceptionally promising.

SHORTHORNS.—Although severely culled, the Shorthorns are still rather poor milk producers. One cow qualified in the Record of Performance. The herd sire, Brandon Conjuror, was bred at the Brandon Farm.

METHOD OF FEEDING CATTLE

SUMMER FEEDING.—The cows were turned to pasture on May 30. The pastures were fair during June and July. In August they became scanty and were supplemented with green feed. The ration fed to the milch cows on pasture was as follows:—

RATIONS FOR CATTLE ON PASTURE

	Grain	Green feed	Silage	Hay
	lbs.	lbs.	lbs.	lbs.
June 1-June 10 inclusive	4–10	.....	.....	10–12
June 11-July 31 "	3– 6	.....	.....	.....
Aug. 1-Aug. 31 "	4– 8	40–50	.....	.....
Sept. 1-Sept. 30 "	4– 8	.....	30–45	.....
Oct. 1-Oct. 31 "	4– 8	.....	30–45	6

NOTE.—Cows under test were fed a somewhat heavier grain ration.

WINTER FEEDING.—The daily ration fed to milch cows was as follows:—

Silage	15–30 pounds
Roots	15–30 "
Hay	8–12 "
Meal	6–20 "

The roots were replaced by silage after March 20. The meal mixture fed to cows in heavy milk consisted of one part bran, one part crushed oats, two parts brewers' grain and one part oil cake. The meal mixture fed to dry cows and those nearing the end of their lactation period consisted of crushed oats, two parts; bran, two parts; brewers' grain, one part; and oil cake, one part. Salt was added to the meal mixture at the time of mixing.

MILK PRODUCTION OF PURE-BRED COWS

The accompanying table shows the milk record of all the milch cows that finished their lactation period during the year 1924. In the case of heifers with their first calf, feed is charged from date of freshening. In the case of cows with previous lactation periods, the charge for feed includes the period during which they were dry before beginning the lactation period here recorded. The following prices were charged for feed:—

Hay	$ 9 63 per ton
Roots	3 63 "
Ensilage	3 76 "
Green feed	2 00 "
Meal mixture	37 00 "
Pasture	1 00 per month

Name of Animal	Age in years	Days in lactation period	Pounds of milk for period	Daily Average yield milk	Average per cent fat in milk	Pounds butter produced in period	Feed Eaten in Period					Total cost of feed for period	Cost to produce 100 lbs. milk	Cost to produce 1 lb. butter
							Meal eaten	Roots and ensilage eaten	Hay eaten	Green feed eaten	Months on pasture			
	yrs.	days	lbs.	lbs.	p.c.	lbs.	lbs.	lbs.	lbs.	lbs.	months	$ cts.	$ cts.	$ cts.
Ayrshire—														
Pansy of Fredericton 2nd	4	394·0	10,063·3	25·54	4·3	519·85	4,369	15,569	2,927	1,240	6·50	131 73	1 30	0 253
Midnight	3	408·0	9,973·8	24·44	4·8	573·51	4,348	12,179	2,827	.....	4·80	121 64	1 21	0 212
Spottie	4	320·0	9,752·4	30·47	4·0	459·38	3,513	11,965	2,135	1,240	3·20	101 96	1 04	0 222
Topaz of Fredericton	5	270·0	8,554·0	31·68	4·0	403·84	3,660	12,290	2,356	1,680	5·00	108 66	1 27	0 269
Torchlight	5	377·0	7,678·4	20·36	4·9	448·77	3,606	14,060	2,845	1,240	7·00	114 86	1 49	0 256
Pansy's Best	4	333·0	6,263·3	18·80	4·2	313·06	3,269	10,284	2,635	.....	4·80	97 18	1 55	0 310
*Jessie D's Bonnie Lass	2	375·0	5,762·2	15·36	4·6	314·67	2,886	9,889	2,561	.....	4·80	89 06	1 54	0 283
White Bess of Ottawa	5	252·0	5,232·8	20·76	3·9	243·34	2,310	9,380	1,769	1,240	3·30	73 21	1 40	0 301
Jessie D's Bonnie Lass	3	226·5	5,004·9	22·09	4·1	243·90	2,210	6,430	1,557	1,240	5·00	66 66	1 33	0 273
Lass of Fredericton	4	357·0	4,562·1	12·77	4·0	216·39	2,750	10,554	2,811	.....	6·64	90 79	1 99	0 419
Holstein—														
Helen Clover Ormsby	4	387·5	18,160·5	46·86	3·6	777·69	7,939	20,531	3,924	930	4·80	209 60	1 15	0 270
Lee Keyes Korndyke	7	386·0	17,560·0	45·49	3·2	672·02	7,439	19,850	3,764	930	4·80	198 42	1 12	0 295
May Echo Frances	6	351·0	17,002·0	48·43	2·9	596·17	6,877	16,660	3,706	930	4·80	181 91	1 06	0 305
May Echo Plus Model	4	364·0	15,561·2	42·75	3·2	590·54	6,841	16,850	3,414	930	4·80	180 11	1 15	0 305
Lee Keyes	3	294·0	9,780·9	33·26	3·5	408·44	4,797	12,835	2,770	930	4·80	132 68	1 35	0 325
Johanna Alcartra Lee	3	365·0	9,065·5	24·89	3·6	386·34	3,490	11,160	2,777	1,240	5·20	105 23	1 15	0 272
March Echo Segis	2	302·0	7,406·7	24·52	3·2	282·97	3,227	10,954	2,678	.....	2·07	96 12	1 29	0 340
*Echo Ormsby Lee Keyes	5	259·5	5,395·1	20·79	3·2	205·17	2,090	8,850	2,011	330	4·80	69 96	1 29	0 341
Shorthorn—														
Princess of Northlynd	10	363·0	7,061·0	19·45	3·5	295·44	3,404	16,820	3,145	.....	5·80	115 35	1 63	0 390
Champion Fredericton Lily	3	318·0	4,083·3	12·84	4·3	207·35	1,766	7,845	1,922	1,240	5·00	62 80	1 53	0 303
Kentville Princess 4th	2	310·0	3,282·2	10·58	4·4	169·95	1,820	9,080	2,311	.....	3·20	64 96	1 97	0 382
Kentville Jessamine 9th	2	316·0	3,347·6	10·59	4·1	161·63	1,717	7,720	1,902	1,240	5·00	61 56	1 83	0 380
Charlotte of Fredericton	5	242·5	3,177·0	13·10	4·5	170·83	1,744	6,778	1,619	1,240	5·00	58 93	1 85	0 345
*Kentville Jessamine 10th	2	43·5	717·6	16·49	4·4	37·09	390	1,840	460	.....	.....	12 79	1 78	0 345

*Ayrshire cow Jessie D. Bonnie Lass, Holstein cow Echo Ormsby Lee Keyes, and the heifer Kentville Jessamine 10th, were sold before they finished their lactation periods.

RATIONS FED DAIRY HEIFERS

Generally speaking, dairy heifers were fed the following milk and meal rations:—

RATIONS FOR HEIFERS

Age	Whole milk	Skim-milk	Dry meal
	lbs.	lbs.	lbs.
1–4 weeks	10–14	.....	.....
4–8 "	7	7	0·5–1
2–4 months	.....	14	1·0–2
4–6 "	.....	14	2·0–3
6–8 "	.....	14	3

Except in case of an oversupply, skim-milk was discontinued after the eighth month. Calves were fed hay and roots as soon as they would eat them. The amounts were gradually increased so that the calves were eating an average of four pounds hay and twenty pounds either roots or silage when eight months old. All calves which were six months of age on June 10 were weaned and put to pasture. The young cattle were housed on November 1.

The dry meal mixture fed to calves was composed of bran, 3 parts; crushed oats, 2 parts; oil cake, 1 part; and brewers' grain, 1 part. After May 12, a fat substitute was added to the skim-milk, composed of flax meal, 1 part; crushed oats, four parts. This was fed until the calves were three months of age. As the calves grew older one part of the crushed oats was replaced by corn meal.

Yearling and two-year-old heifers in good condition are fed very little grain until two months before calving. They are then fed liberally with the meal mixture similar to that fed the dry cows, in order to have them freshen in good condition. The costs for the different breeds are shown in the following table:—

COST OF REARING DAIRY HEIFERS

AVERAGE COST OF FEED—FIRST YEAR

Breed of animals	Ayrshire	Holstein	Shorthorn
Number of animals	6	3	2
New milk at $1.50 per cwt. lbs.	918	633	718
Skim-milk at 20 cents per cwt. lbs.	3,580	4,074	4,092
Fat substitute at $58 per ton	5	.....	.....
Meal at $37.50 per ton lbs.	845	1,026	942
Ensilage at $3.76 per ton lbs.	1,263	1,927	1,243
Roots at $3.63 per ton lbs.	613	803	910
Hay at $9.63 per ton lbs.	792	1,015	891
Pasture at $1 per month mos.	1·96	1·29	1·53
Cost of feed first year $	46 15	48 11	46 35

AVERAGE COST OF FEED—SECOND YEAR

Breed of animals	Ayrshire	Holstein	Shorthorn
Number of animals	4	.....	2
Meal at $37 per ton lbs.	696	.....	622
Ensilage at $3.76 per ton lbs.	4,505	.....	3,915
Roots at $3.63 per ton lbs.	1,020	.....	1,020
Hay at $9.63 per ton lbs.	1,634	.....	1,529
Pasture at $1 per month mos.	4·67	.....	5·00
Cost of feed second year $	35 71	.....	33 07

AVERAGE COST OF FEED—FROM SECOND YEAR TO DATE OF CALVING

Breed of animals	Ayrshire	Holstein	Shorthorn
Average age at date of calving	2 y. 9 m. 27 dy.	2 y. 7 m. 4 dy.	2 y. 7 m. 5 dy.
Number of animals	1	1	2
Meal at $37 per ton....lbs.	444	878	290
Ensilage at $3.76 per ton....lbs.	2,955	5,940	1,605
Roots at $3.63 per ton....lbs.	1,020	.....	.....
Hay at $9.63 per ton....lbs.	1,414	1,296	703
Pasture at $1 per month....mos.	5·00	3·67	5·00
Cost of feed for period.... $	27 41	37 31	16 75

CORN VERSUS SUNFLOWER SILAGE FOR DAIRY COWS

In order to obtain additional data on the relative value of corn and sunflower silage, these feeds were retested this year. A group of seven cows, consisting of two Ayrshire, three Holsteins and two Shorthorns, was used in this experiment.

The experiment was divided into three periods of three weeks each. Corn silage was fed during the first and third periods and sunflower silage during the second period. The results from the first and third periods were averaged and compared with these from the second period. Data were taken for the final week in each period only, the first two weeks in each case being considered necessary for the cattle to become accustomed to the feed. The corn silage was made from rather immature corn and the sunflowers were cut when fifty per cent were in bloom. (Project A. 13.)

CORN VERSUS SUNFLOWER SILAGE FOR DAIRY COWS

Items	Period 1	Period 2	Period 3	Average periods 1 and 3
	Corn silage	Sunflower silage	Corn silage	Corn silage
Number of cows in test	7	7	7	7
Number of days taken for test....dys.	7	7	7	7
Total milk produced in 7 days....lbs.	1,476·1	1,347·2	1,226·7	1,351·4
Average percentage fat.... %	3·35	3·46	3·59	.....
Total Butterfat produced in 7 day period....lbs.	49·44	46·61	44·04	46·74
Total meal eaten in 7 day period....lbs.	532	532	532	532
Total hay eaten in 7 day period....lbs.	532	532	532	532
Total silage eaten in 7 day period....lbs.	3,290	3,290	3,290	3,290
Meal consumed per 100 lb. milk produced....lbs.	36·04	39·48	43·36	39·36
Hay consumed per 100 lb. milk produced....lbs.	36·04	39·48	43·36	39·36
Silage consumed per 100 lb. milk produced....lbs.	222·89	244·21	268·19	243·45
Weight of cows at beginning of 3 week feeding period....lbs.	8,475	8,660	8,915	.....
Gain in weight during 3 week feeding period....lbs.	175	255	−20	.....
Statement of Cost				
Meal mixture at $1.85 cwt.... $	9 84	9 84	9 84	9 84
Hay at $9.60 per ton.... $	2 56	2 56	2 56	2 56
Corn silage at $3.76 per ton.... $	6 18	.....	6 18	6 18
Sunflower silage at $3.49 per ton.... $	.....	5 74	.....	.....
Total cost of feed.... $	18 58	18 14	18 58	18 58
Feed cost to produce 100 lb. milk.... $	1 25	1 34	1 51	1 37
Feed cost to produce 100 lb. butterfat.... $	37 58	38 91	42 18	39 75

FEEDING EXPERIMENT—HEAVY VERSUS LIGHT FEEDING FOR GROWING HEIFERS

In order to compare a liberal ration with a scanty ration for growing heifers, fifteen grade heifer calves of mixed breeding were purchased during April, 1924. The heifers were weighed on April 23 and divided into two groups.

Group 1, consisting of seven calves, were fed as follows:—

—	Whole milk	Skim-milk	Dry meal[1]
	lb.	lb.	lb.
April 23-April 27 incl. (to 2 weeks)	12	.....	.....
April 28-May 11 incl. (to 4 weeks)	4	8	½
May 12-June 8 incl. (to 8 weeks)	.....	14	½–½
June 9-July 6 incl. (to 12 weeks)	.....	10	½–1
July 7-July 13 incl. (to 13 weeks)	.....	5	1
July 14-Sept. 24 incl. (to 23 weeks)	.....	.....	1
Sept. 25-Oct. 31 incl. (to 28½ weeks)	.....	.....	No grain. Calves on clover aftermath.

[1] Dry Meal—Equal parts crushed oats and bran.

This group of calves (Group No. 1) was given all the hay it would eat until June 17. From June 17 the calves were at pasture and were not given any hay. On September 25 they were put on clover aftermath and the grain was discontinued. They were stabled on November 1 and fed on hay and roots.

Group 2, consisting of eight calves were fed as follows:—

—	New milk	Skim-milk	Fat substitute[1]	Dry meal[2]
	lb.	lb.	lb.	lb.
April 23-May 11 incl. (to 4 weeks)	12	.....	.....	.....
May 12-May 25 incl. (to 6 weeks)	7	7	½–½	½–½
May 26-Oct. 31 incl. (to 28½ weeks)	.....	14	½–½	½–3

[1] Fat-substitute.—Flax meal, 1 part and oats, 4 parts for first three months. Flax meal, 1 part; oats, 3 parts; corn meal, 1 part; as calves grew older.
[2] Dry meal.—Bran, 3 parts; crushed oats, 2 parts; oil meal, 1 part; Brewer's grains, 1 part.

This group of calves was fed all the hay it desired. From July 17 it had the run of a paddock during the night but the calves were returned to the box-stalls each morning. On November 1, the skim-milk and fat-substitute were discontinued and each calf was fed 15 pounds of turnips per day.

The results from first weighings, April 23 to November 1, are shown in the following table:—

FEEDING EXPERIMENT—HEAVY VERSUS LIGHT FEEDING FOR GROWING HEIFERS—RESULTS APRIL 23–NOVEMBER 1

—		Group 1—heifers fed light ration	Group 2—heifers fed heavy ration
Number of animals in group		7	8
Number of days in feeding period April 23 to November 1	days	192	192
Gross initial weight April 23	lb.	596	714
Average initial weight April 23	"	85·14	89·25
Gross weight November 1	"	1,696	2,718
Average weight November 1	"	242·28	339·75
Gross gains in period	"	1,100	2,004
Average gains in period	"	157·1	250·5
Whole milk eaten in period	"	812	2,636
Skim-milk eaten in period	"	5,733	18,452
Fat-substitute eaten in period	"	.....	501
Meal eaten in period	"	768	2,352
Hay eaten in period	"	194	4,199
Months at pasture	mos.	4·5	.....

FEEDING EXPERIMENT—HEAVY VERSUS LIGHT FEEDING FOR GROWING HEIFERS—*Concluded*
RESULTS APRIL 23–NOVEMBER 1

—		Group 1—heifers fed light ration	Group 2—heifers fed heavy ration
Statement of Costs—			
Whole milk at $30 per ton	$	12·18	39·54
Skim-milk at $4 per ton	$	11·47	36·90
Fat-substitute at $57.80 per ton	$	.....	14·48
Meal at $36.50 per ton	$	.....	42·92
Meal at $36 per ton	$	13·82	.....
Hay at $9.63 per ton	$	0·93	20·22
Pasture at 20c. per month per calf	$	6·30	.....
Total cost of feed	$	44·70	154·06
Cost of feed per calf	$	6·385	19·257
Cost of feed per cwt. gain	$	4·063	7·687

The results to November 1, seem to show:—

1. That heifers fed a heavy ration will make larger gains.
2. That these gains will be at a greater cost per hundredweight.

It was impossible to tell if the scanty ration had any injurious effect on the health of the calves. They were thin and rather stunted but were in good spirit and continued to make fair gains through the winter on their ration of hay and turnips.

HORSES

The horses numbered thirteen on December 31, 1924, and consisted of one aged stallion, two mature mares, one three-year-old mare, one three-year-old gelding, one two-year-old mare, and one yearling gelding, all of these being pure-bred Clydesdales. In addition there were two grade Clydesdale geldings, one mature grade Clydesdale mare, one two-year-old Clydesdale mare, and two general-purpose mares sired by standard-bred horses. A horse foal was born on October 10 and died October 13. This foal was weak at birth and its joints began to swell the day after birth. The mare had been given a teaspoonful of a saturated solution of potassium iodide on the first and the fifteenth of each month while pregnant.

No experimental work on the maintenance of idle horses was carried on as the horses were at hard work during the winter months. The grain ration for work horses varied from twelve to twenty-six pounds, depending on the character of the work and the size of the horse. A mixture of oats and bran was fed. The percentage of bran varied according to the character of the work. The horses worked a total of 21,161.5 hours during the year. A summary of the work performed by eight heavy horses is shown in the following table:—

COST OF HORSE LABOUR

—		Eight Horses	Average
Total hours worked	hrs.	16,904·0	2,113·0
Oats consumed	lb.	41,847·0	5,230·9
Bran consumed	"	10,071·0	1,259·0
Hay consumed	"	50,824·0	6,353·0
Roots consumed	"	1,155·0	144·0
Hours tending horses	hrs.	1,442·0	180·2
Oats at 58 cts. per bush	$	713·86	89·23
Bran at $30.85 per ton	$	155·34	19·42
Hay at $9.63 per ton	$	244·71	30·59
Roots at $3.63 per ton	$	2·096	0·262
Labour tending horses at 25 cts. per hr	$	360·50	45·0
Horse shoeing	$	101·11	12·64
Total cost	$	1,577·61	197·20
Cost per hour, horse labour	$	0·093	0·093

Two of the eight horses were sold on December 8. Therefore, the eight horses were on the farm a total of 2,884 days, an average of 360.5 days per horse. The labour of tending the horses is charged at the rate of half an hour per day per horse. When the horses were shod in town the prevailing prices, ($3 per set of new shoes and $2 for changing shoes) were charged. When the horses were shod by the stableman the material used was charged at market prices and the stableman's time at 30 cents per hour.

The remaining team of work horses consisted of colts which were scarcely worked until the month of May.

FEED USED IN RAISING YOUNG HORSES

		Birth to one year	Birth to two years		Birth to three years	
		Fred-ericton Prince	Josie of Fred-ericton	Kitty	Gertie of Fred-ericton	Rose Spencer
Bran consumed	lb.	502	662	767	906	888
Oats consumed	"	1,029	3,210	3,381	4,294	4,245
Hay consumed	"	3,158	5,134	5,343	8,348	8,288
Roots consumed	"	.....	353	353	479	475
Pasture	mos.	.....	5	5	10	10
Weight at end of period	lb.	830	1,185	1,270	1,335	1,340

FEED COST OF RAISING YOUNG HORSES

		Birth to one year	Birth to two years		Birth to three years	
		Fred-ericton Prince	Josie of Fred-ericton	Kitty	Gertie of Fred-ericton	Rose Spencer
Bran at $30.85 per ton	$	7·74	10·21	11·83	13·97	13·69
Oats at 59 cts. per bush	$	17·85	55·69	58·66	74·50	73·65
Hay at $9.63 per ton	$	15·20	24·72	25·72	40·19	39·90
Roots at $3.63 per ton	$	.....	0·64	0·64	0·86	0·86
Pasture at $1 per month	$	.....	5 00	5·00	10·00	10·00
Total cost of feed	$	40·79	96·26	101·85	139·52	138·10

The last six horses raised consumed an average of 369 pounds of bran, 1,211 pounds of oats, 2,566 pounds of hay, and 153 pounds of roots during the first year. With feeds at the same relative prices as in this table, the feed cost would be $39.32. They weighed an average of 804 pounds.

The last five horses raised consumed an average of 679 pounds of bran, 2,710 pounds of oats, 5,235 pounds of hay, 349 pounds of roots, and were five months on pasture during the first two years. With feeds at the same relative prices as in this table, the feed cost would be $88.31. They weighed an average of 1,144 pounds.

The last three horses raised consumed an average of 975 pounds of bran, 4,350 pounds of oats, 8,486 pounds of hay, 555 pounds of roots, and were ten months at pasture during the first three years. With feeds at the same relative prices as in this table, the feed cost would average $142.36. They weighed an average of 1,381 pounds when three years of age.

SHEEP

The flock consisted of forty-four head on December 31, 1924. Of these, thirty were pure-bred Shropshires, and fourteen were grades. These latter were purchased the previous spring for experimental purposes. The stock ram,

Buttar 329, was found dead in the pasture on July 23. He was replaced by a ram (McEwen A 432) purchased from Alexander Dow and Sons, Metcalfe, Ontario.

A trace of tapeworm infestation was noted last fall. Three treatments with worm tablets failed to free the sheep from the infestation. They were then dosed twice with male fern according to the directions on Experimental Farms' Exhibition Circular No. 61. This treatment apparently freed the flock from these parasites.

The sheep were sheared May 3, dipped May 28, dipped again October 25, put with the ram October 27, and housed November 18.

The pure-bred lambs were weaned on August 2. Owing to the small number of lambs available, and the lack of sufficient rape, the early-weaning experiment was not conducted this year.

The ewes and lambs were wintered on hay and turnips.

Breeding ewes, Fredericton Experimental Station.

COST OF MAINTAINING PURE-BRED EWES

The pure-bred sheep were housed on November 23, 1923, and turned to pasture on May 30, 1924. This made a total of 190 days in the barn. During this time they were fed as follows:—

RATION PER DAY

—	Hay	Roots	Grain
	lb.	lb.	lb.
November 23 to March 2 (inclusive)	2·5	7	.....
March 3 to March 31 (inclusive)	2·5	7	1·0
April 1 to April 30 (inclusive)	3·0	3	1·25
May 1 to May 30 (inclusive)	3·5	.....	1·5

The average cost of feed per ewe while in the barn was as follows:—

530 lbs. hay at $9.63 per ton	$	2.55
990 lbs. roots at $3.63 per ton		1.80
110 lbs. grain at $40 per ton		2.20
Total cost	$	6.55

The cost for maintaining 13 ewes, their 17 lambs and the stock ram (labour, bedding, interest and depreciation neglected) was as follows:—

Winter feed for 14 head at $6.55 each	$ 91.70		
Pasture for 14 head at $1.50 each	21.00		
Pasture for 17 lambs from Aug. 1 at 50 cts. each	8.50		
Extra cow's milk to weak lambs, 605 lbs. at $2 cwt.	12.10		
Grain fed ram lambs after weaning, 395 lbs. at $1.75 per cwt.	6.91		
Grain fed ewe lambs after weaning, 364·5 lbs. at $1.75 per cwt.	6.38		
Dipping material, twine, etc.	3.00		
Total cost		$	149 59
The returns from these ewes were as follows:—			
4 XXX rams sold for breeding purposes	$ 60.00		
2 XX rams sold for breeding purposes	22.00		
1 cull ram sold to the butcher	7.63		
1 XXX ram on hand, value	15.00		
9 ewe lambs kept for breeding purposes, value $15 per head	135.00		
113 lbs. medium clothing wool at 30 cts. per lb.	33.90		
Total		$	273 53
Profit on ewes, labour interest and depreciation, neglected			123 94
Profit per ewe, interest and depreciation neglected			9 53

WINTERING LAMBS

Nine pure-bred Shropshire lambs were housed on November 23 and turned to pasture on May 30. The ration was as follows:—

RATION PER DAY

—	Hay	Roots	Grain
	lb.	lb.	lb.
November 23 to March 31 (130 days)	2	6	0·5
April 1 to May 30 (60 days)	3	.....	0·5

STATEMENT OF FEED COST AND RETURNS PER LAMB WINTERED

440 lbs. hay at $9.63 per ton	$	2 12
780 lbs. roots at $3.63 per ton		1 43
95 lbs. grain at $40 per ton		1 90
Total cost of feed		5 45
8·87 lbs. medium combing wool sold at 30 cts. lb.		2 66
Cost over returns of wintering lambs, labour, bedding and interest neglected		2 79

The hay fed during the winter of 1923-24 contained very little clover. Therefore half a pound of grain per day was fed in order to keep the lambs in good growing condition. In the winter of 1924-25 the lambs were not fed any grain after October 27 as the hay was largely good quality clover.

RATIONS FOR BREEDING EWES

On March 3 the breeding ewes were divided into three groups and fed the following grain ration:—

Group 1.—One pound of a mixture composed of equal parts, oil cake, bran, crushed oats, and corn.

Group 2.—One pound of a mixture composed of 2 parts, crushed oats, 1 part, bran.

Group 3.—No grain.

The lambs in all three groups were fed the grain mixture fed Group 1, in creeps. As the sheep suffered from an infestation of tapeworm, the results obtained were of doubtful value. The experiment was therefore discontinued and all the sheep were fed a grain mixture from April 2 until they were turned to pasture similar to that supplied to Group 1.

SHEEP-DIPPING EXPERIMENT

In order to compare sodium fluoride solutions of various strengths with Cooper's dip for the control of sheep ticks, an experiment was conducted in co-operation with the Entomological Branch. Six groups, each consisting of two grade lambs, these having been purchased from neighbouring farmers on May 5, were treated with different solutions on May 17. The lambs were examined on May 21. One and one-quarter ounces of sodium fluoride per gallon were found to control ticks.

SHEEP DIPS

Material used	Number ticks on each lamb before dipping	Number ticks on each lamb after dipping	Per cent control obtained	Remarks
			p.c.	
¼ oz. sodium fluoride per gal. water	No. 1 6 No. 2 8	2 5	50	
½ oz. sodium fluoride per gal. water	No. 1 14 No. 2 7	10 10	4·75	Apparently there was a heavy emergence of adults from pupae on these animals as re-infection was an impossibility.
¾ oz. sodium fluoride per gal. water	No. 1 32 No. 2 13	1 1	95·6	
1 oz. sodium fluoride per gal. water	No. 1 9 No. 2 24	0 1	96·97	
1¼ oz. sodium fluoride per gal. water	No. 1 12 No. 2 66	0 0	100	Blistering noticed under legs.
Cooper's Dip as per directions	No. 1 12 No. 2 16	0 0	100	

SWINE

The swine herd at this Station, on December 31, 1924, numbered nine head consisting of the pure-bred imported boar Rogersfield Wonder—88844—and eight pure-bred sows of more than average merit. The females range in age from under one year to two and one-half years. They are in splendid health and bloom and have been bred to farrow early in the month of April.

The herd, during the year, has been augmented by two consignments from the Central Farm herd at Ottawa. The first lot consisted of six pure-bred sows which reached this Station in February. Of this lot only two remain in the herd, sows No. 307 and 331. These two sows farrowed litters of thirteen and twelve pigs respectively and were of sufficiently good type and quality to be held as breeders. Of the others, sow No. 304 gave birth to a premature litter and later became so emaciated that she was killed. Sow No. 314 farrowed nine very weak pigs which died shortly after birth as did also the dam. Sows No. 310 and 324 did not prove to be good breeders and were disposed of.

The second shipment from the Central Farm herd consisted of four pure-bred sows of excellent type. All of these will be retained in the breeding herd until farrowing time and if they drop good litters and prove to be good mothers, they will be added to the permanent herd.

COST OF RAISING YOUNG PIGS TO SIX WEEKS

Complete data on the cost of raising litters to six weeks were not available on the full complement of sows farrowing during the spring of 1924 at this Station. Records were kept for the two home-bred sows, Nos. 127 and 128. These two sows farrowed litters in the fall of 1923 and again in the spring of 1924. The cost of the respective litters is therefore computed from the time the fall litter was weaned until the spring litter was weaned, which in both cases was at six weeks of age. Farrowing records and cost of raising litters to six weeks of age are shown in the following tables:—

FARROWING RECORDS

Sow number	Date of birth	Farrowing date	Number of pigs in litter	Number reared
314	Feb. 16, 1923	April 12, 1924	9	0
127	May 11, 1922	April 17, 1924	12	11
128	May 11, 1922	April 20, 1924	10	10
307	Feb. 22, 1923	April 25, 1924	13	8
324	Mar. 1, 1923	June 5, 1924	12	8
310	Feb. 20, 1923	June 7, 1924	4	4
331	Mar. 3, 1923	July 25, 1924	12	11
Total			72	52

Average number of pigs farrowed per spring litter ..... 10·28
Average number of pigs reared per spring litter ..... 7·4
No fall litters were farrowed in 1924.

COST OF RAISING LITTERS TO SIX WEEKS

Average number of pigs per spring litter 11

Statement of Feed to Birth

Mangels, 1,606 lbs. at 18c. per cwt	$ 2 89
Potatoes, 480 lbs. at 30c. per cwt	1 44
Shorts, 531 lbs. at $1.69 per cwt	8 97
Oil cake, 30 lbs. at $2.30 per cwt	69
Crushed oats, 120 lbs. at $1.80 per cwt	2 16
Barley, 120 lbs. at $1.82 per cwt	2 18
Middlings, 120 lbs. at $1.99 per cwt	2 38
Total	$20 71

Statement of Feed from Birth to Six Weeks

Skim-milk, 1,260 lbs. at 20c. per cwt	$ 2 52
Crushed oats, 126 lbs. at $1.80 per cwt	2 26
Middlings, 126 lbs. at $1.99 per cwt	2 50
Oil cake, 84 lbs. at $2.30 per cwt	1 93
Total	$ 9 21

Statement of Cost

Boar service	$ 2 00
Feed to birth	20 71
Feed, birth to six weeks	9 21
Total cost to six weeks	31 92
Average cost per pig to six weeks	2 90

FEEDING HOGS FOR BACON PRODUCTION—A COMPARISON OF BARLEY, CORN, BUCKWHEAT AND MIDDLINGS

The experiment comparing barley, corn and buckwheat for the production of bacon hogs was again continued this year. Middlings were also included in the test as a large number of farmers in New Brunswick develop and finish hogs on this feed. The twenty-four pigs utilized in this experiment were a very uniform lot both in type and size. They were all sired by the Station boar Rogersfield Wonder, and were out of three grade sows which are full sisters. All farrowed within a few days of one another. The pigs were divided into eight lots with three in each lot and fed in accordance with the following plan: Lot 1, from six to ten weeks of age, oats and middlings in equal parts with skim-milk. From ten to fourteen weeks, oats, 2 parts; shorts, 1 part; middlings, 1 part; barley, 1 part; with skim-milk and green feed. From fourteen to twenty weeks, oats, 2 parts; shorts, 2 parts; barley, 2 parts; with skim-milk and green feed. From twenty weeks to finish, oats, 1 part; shorts, 1 part; barley, 2 parts; with skim-milk and green feed. Lot 2 was fed the same as Lot 1 except that the barley was replaced by corn. Lot 3 was fed the same as Lot 1 except that the barley was replaced by buckwheat. Lot 4, from six to ten weeks, was fed the same as Lot 1; while from ten weeks to finish, middlings, skim-milk and green feed were supplied. Lots 5, 6, 7 and 8 were fed the same at Lots 1, 2, 3 and 4 respectively with the exception that Lots 5, 6, 7 and 8 were on pasture from June 28 until late fall. For the first two months the pigs were on oat and pea pasture and for the balance of the season on rape pasture. For the twelve pigs in Lots 5, 6, 7, and 8, a total of two acres of pasture was required.

The following prices were charged for feeds:—

Oats	$ 1 80 per cwt.
Middlings	1 99 "
Shorts	1 69 "
Barley	1 82 "
Corn	2 25 "
Buckwheat	2 48 "
Skim-milk	0 20 "

COMPARISON OF BARLEY, CORN, BUCKWHEAT AND MIDDLINGS FOR BACON HOGS

—	Group I Barley	Group II Corn	Group III Buck-wheat	Group IV Mid-dlings	Group V Barley	Group VI Corn	Group VII Buck-wheat	Group VIII Mid-dlings
Number of pigs in experiment	3	3	3	3	3	3	3	3
Number of days in experiment	158	158	158	158	194	194	194	194
Gross initial weight (at 6 weeks) lbs.	73·1	73·1	73·1	73·1	73·1	73·1	73·1	73·1
Gross finished weight lbs.	489·0	526·0	566·0	576·0	557·0	544·0	635·0	648·0
Average finished weight lbs.	163·0	175·3	188·6	192·0	189·0	181·3	211·6	216·0
Gross dressed weight lbs.	361·0	394·0	433·0	423·0	388·0	390·0	463·0	465·0
Dressing percentage %	73·8	74·9	76·5	73·4	69·6	71·6	72·9	71·7
Total gain per group lbs.	415·9	452·9	492·9	502·9	473·9	472·9	561·9	574·9
Average gain per animal lbs.	138·6	150·8	164·3	167·6	157·9	157·6	187·3	191·6
Average daily gain per animal lbs.	0·877	0·954	1·04	1·06	0·814	0·812	0·965	0·987
Statement of Feed								
Meal fed 1st period lbs.	123·75	123·75	123·75	123·75	123·75	123·75	123·75	123·75
Meal fed 2nd period lbs.	187·0	180·0	194·0	196·0	188·0	145·0	191·0	189·0
Meal fed 3rd period lbs.	343·0	319·0	335·0	336·0	239·0	198·0	235·0	231·0
Meal fed 4th period lbs.	579·0	644·0	621·0	572·0	862·0	868·0	1,000·0	1,006·0
Total meal fed lbs.	1,232·75	1,266·75	1,273·75	1,227·75	1,412·75	1,334·75	1,549·75	1,549·75
Total skim-milk fed lbs.	2,744·0	2·744·0	2,744·0	2,744·0	2,744·0	2,744·0	2,744·0	2,744·0
Meal fed per 100 lbs. gain lbs.	296·4	279·7	258·4	244·1	297·9	282·2	275·8	269·5
Statement of Costs								
Cost of pigs at 6 weeks $	16 50	16 50	16 50	16 50	16 50	16 50	16 50	16 50
Total cost of meal fed $	22 11	25 93	23 43	24 34	26 30	26 22	31 73	30 71
Total cost of buttermilk fed $	5 48	5 48	5 48	5 48	5 48	5 48	5 48	5 48
Total cost of feed $	27 59	31 41	28 91	29 82	31 78	31 70	37 21	36 19
Total cost of hogs $	44 09	47 91	45 41	46 32	48 28	48 20	53 71	52 69
Feed cost per 100 lbs. gain $	6 63	6 93	5 86	5 94	6 70	6 70	6 62	6 29
Cost per 100 lbs. dressed weight $	12 21	12 16	10 48	10 95	12 44	12 35	11 60	11 33

The results of the experiment may be summarized as follows:—

1. Middlings-fed hogs made the greatest average daily gain, with buckwheat-fed hogs close seconds and corn and barley-fed hogs making the lowest average daily gain.

2. Middlings-fed and buckwheat-fed hogs produced pork at an appreciably lower cost per hundred pounds than did either barley or corn-fed hogs.

3. When barley and corn are compared on a cost of production basis very little distinction can be noted. Similarly middlings and buckwheat, from a cost of production basis, are about on a par.

The hogs in the above experiment were slaughtered at this Station and allowed a reasonable length of time to cool and set, after which each carcass was graded. The grading results are summarized in the following table:—

GRADING RESULTS

Pen number and ration	Hog's number	Carcass grading	Quality	Dressed weight
Pen No. 1—Barley	258	Prime	Fairly firm	144
	259	Leanest	Thin and soft	110
	260	Lean	Thin and soft	107
Pen No. 2—Corn	261	Lean	Soft	131
	262	Lean	Soft	145
	263	Lean	Fairly firm	118
Pen No. 3—Buckwheat	264	Prime	Little soft	151
	265	Lean	Fairly firm	139
	266	Lean	Little soft	143
Pen No. 4—Middlings	267	Prime	Fairly firm	145
	268	Lean	Fairly firm	143
	269	Lean	Firm	135
Pen No. 5—Barley	270	Lean	Fairly firm	126
	357	Leanest	Thin and soft	100
	359	Prime to lean	Fairly firm	162
Pen No. 6—Corn	376	Lean	Soft	122
	377	Lean	Soft	141
	388	Lean	Soft	127
Pen No. 7—Buckwheat	360	Lean	Little soft	147
	362	Prime	Little soft	159
	364	Prime	Fairly firm	157
Pen No. 8—Middlings	368	Prime	Fairly firm	161
	369	Prime	Fairly firm	167
	372	Prime	Firm	137

HEAVY FEEDING OVER A SHORT FEEDING PERIOD VERSUS LIGHT FEEDING OVER A LONG FEEDING PERIOD AND THE EFFECT ON TYPE OF HOG AND COST OF PRODUCTION

This experiment was undertaken to secure data on the influence of feeding method on type in hogs. In common practice it is generally assumed that hogs acquire greater length and hence are more desirable for the export trade when fed rather sparingly over a long feeding period.

A total of nine pigs was used in the experiment. These were divided into three lots with three pigs in each lot. Lot 1 was hopper-fed during the experiment with access to all the feed they could consume. Lot 2 was pail-fed, receiving all they would clean up. Lot 3 was pail-fed lightly until the finishing period when they were put on a full ration. The ration fed to each lot was identical except in quantity and was as follows: From six to ten weeks, equal parts of crushed oats and middlings with skim-milk and green feed. From ten to fourteen weeks, crushed oats, 2 parts; middlings, one part; shorts, 1 part; and corn, 1 part; with skim-milk and green feed. From fourteen weeks to finish, equal parts of crushed oats, shorts and corn with skim-milk and green

feed. The following prices were charged for the feeds used in this experiment:—

Crushed oats	$ 1 80 per cwt.
Corn	2 25 "
Shorts	1 69 "
Middlings	1 99 "
Skim-milk	20 "

METHOD OF FEEDING ON TYPE OF BACON HOG AND COST OF PRODUCTION

—	Group I Hopper-fed	Group II Pail-fed (Full ration)	Group III Pail-fed (Light ration)
Number of pigs in experiment	3	3	3
Number of days in experiment	153	153	171
Gross initial weight at 6 weeks lbs.	90·0	82·0	87·0
Gross finished weight lbs.	597·0	577·0	597·0
Average finished weight lbs.	199·0	192·3	199·0
Gross dressed weight lbs.	448·0	433·0	454·0
Dressing percentage %	75·04	75·04	76·04
Total gain per group lbs.	507·0	495·0	510·0
Average daily gain per animal lbs.	1·10	1·07	0·994
Average gain per animal lbs.	169·0	165·0	170·0
Statement of Feeds			
Meal fed 1st period lbs.	107·0	120·0	72·0
Meal fed 2nd period lbs.	284·0	264·0	134·0
Meal fed 3rd period lbs.	825·0	780·0	1,138·0
Total meal fed lbs.	1,216·0	1,164·0	1,344·0
Total skim-milk fed lbs.	3,046·0	3,046·0	2,956·0
Meal fed per 100 lbs. gain lbs.	239·8	235·1	263·5
Statement of Costs			
Cost of pigs at 6 weeks at $3.04 $	9 12	9 12	9 12
Total cost of meal fed $	23 26	22 22	25 69
Total cost of buttermilk $	6 09	6 09	5 91
Total cost of feed $	29 35	28 31	31 60
Total cost of hogs $	38 47	37 43	40 72
Cost per 100 lbs. gain $	5 78	5 719	6 196
Cost per 100 lbs. dressed weight $	8 587	8 64	8 969

The recognizable deductions that can be made from this experiment may be summarized as follows:—

1. Light feeding from weaning time until the commencement of the finishing period tends to develop length.

2. Heavy feeding from weaning time until slaughter encourages compactness rather than length. Maturity is also measurably hastened.

3. Quality, from a purely bacon standpoint, length of side, trimness, firmness of fleshing and all the features that are considered essential in bacon hogs are affected favourably when hogs are developed on a growing ration and are affected unfavourably when a heavy ration is fed during the growing stage.

4. The production of first quality bacon hogs requires a somewhat longer feeding period than does the production of short, thick or thick smooth types of hogs.

5. Somewhat more mill feed is required in the production of bacon hogs than is the case with thick smooth hogs.

The hogs in the experiment were graded both as live hogs and on a carcass basis; an accompanying table is a summary of the grading:—

METHODS OF FEEDING ON HOG TYPE—GRADING RESULTS

—	Live Grading	Conformation	Carcass Grading	Length	Quality
Pen No. I—					
Pig No. 310	Short thick	Compact and over done with heavy shoulders, hams, and jowls.	Prime	23¾″	Firm
Pig No. 319	Short thick		Prime	23″	Quite firm
Pig No. 323	Short thick		Prime	24½″	Firm
Pen No. II—					
Pig No. 304	Thick smooth	Similar to Pen I in conformation.	Prime	24″	Firm
Pig No. 307	Thick smooth		Lean	24¼″	Firm
Pig No. 318	Thick smooth		Lean	23″	Soft
Pen III—					
Pig No. 311	Select	Longer sides with trimmer and neater hams, and shoulders.	Lean	28″	Firm
Pig No. 313	Select		Lean	31″	Firm
Pig No. 317	Select		Leanest	28½″	Firm

FIELD HUSBANDRY

The heavy snowfall in April thoroughly saturated the soil and delayed farm operations. Most of the fields were so wet they could not be worked until June. The first dates of seeding were as follows: Wheat, May 14; potatoes, May 16; barley and oats, May 17; turnips, May 20; corn and sunflowers, May 23. June and July were very dry and windy, but August and September were good growing months. Hay was a light crop, straw was very short, and the yield of grain below the average. The grain, however, was very well filled. Corn, sunflowers and roots were good crops. All crops were harvested in good condition.

HAY

Hay-making was begun on July 2 and finished on July 29. The total yield was 132 tons 300 pounds. Twenty-two and one-half acres rotation land yielded 38 tons 40 pounds, or at the rate of 1 ton 1,379 pounds per acre. The cost of the hay on the rotation land is shown in the following table:—

COST OF PRODUCING HAY IN A FOUR-YEAR ROTATION

Rent and taxes		$ 3 00
Manure—2·2 tons at $2 per acre		4 40
Fertilizer—15·5 pounds superphosphate at $1·095 per cwt.		0 17
Seed—Timothy ½ of 10 pounds at $11.35 per cwt.		0 57
Seed—Red clover ½ of 8 pounds at $26.85 per cwt.		1 07
Seed—Alsike clover ½ of 2 pounds at $16.85 per cwt.		0 17
Machinery		3 00
Mowing (man and 2 horses 0·8 hours at 45 cts.)	$ 0 36	
Tedding (man and 2 horses 0·4 hours at 45 cts.)	0 18	
Raking (man and 2 horses 0·46 hours at 45 cts.)	0 21	
Raking (man and 1 horse 0·66 hours at 35 cts.)	0 23	
Drawing to barn and pitching (man and two horses 2·53 hours at 45 cts.)	1 14	
Hand mowing, coiling and shaking out (man 2·57 hours at 25 cts.)	0 64	
Pitching and storing in mow (man 4·57 hours at 25 cts.)	1 14	
	$ 3 90	3 90
Total cost per acre		16 28
Value per acre 1·69 tons at $12		20 28
Profit per acre		4 00
Cost per ton $9.63.		

COST OF PRODUCING OATS IN A FOUR-YEAR ROTATION

On May 20, five acres of land which had been in hoed crop the previous year was sown with Waugh's Banner oats. The oats were harvested on September 8. The cost of production per acre was as follows:—

Rent and taxes		$ 3 00
Manure—30 per cent of 15 tons at $2 per ton		9 00
Fertilizer—150 pounds superphosphate at $1·095 per cwt		1 64
Seed—3 bushels at $1 per bushel		3 00
Machinery		3 00
Twine—2 pounds at 16 cts. per pound		0 32
Ploughing (man and 2 horses 5·0 hours at 45 cts.)	$ 2 25	
Harrowing (man and 4 horses 0·83 hours at 65 cts.)	0 54	
Harrowing (man and 2 horses 1·66 hours at 45 cts.)	0 75	
Seeding (man and 2 horses 1·0 hours at 45 cts.)	0 45	
Rolling (man and 2 horses 0·66 hours at 45 cts.)	0 30	
Cutting (man and 2 horses 1·0 hour at 45 cts.)	0 45	
Stooking (man 1·6 hours at 25 cts.)	0 40	
Drawing to barn (man and two horses 2 hours at 45 cts.)	0 90	
Pitching and mowing (man 4 hours at 25 cts.)	1 00	
	7 04	7 04
Threshing 52 bushels at 8 cts		4 16
Total cost per acre		31 16
Value per acre 52 bushels oats at 64 cts	33 28	
0·716 tons straw at $4	2 86	
Total value per acre	$ 36 14	$36 14
Profit per acre		4 98

Cost per bushel grain 55·18 cts.
" ton straw $3.44.

COST OF PRODUCING SPRING WHEAT IN A FOUR-YEAR ROTATION

On May 14 one and one-third acres of land which had been in hoed crop the previous year were sown with White Russian wheat at the rate of 1.5 bushels per acre. The wheat was cut on September 6. The cost of production per acre was as follows:—

Rent and taxes		$ 3 00
Manure—30 per cent of 15 tons at $2 per ton		9 00
Fertilizer —141 lb. superphosphate at $1·095 per cwt		1 54
Seed—1·5 bushels at $2 per bushel		3 00
Machinery		3 00
Twine—2½ pounds at 16 cts		0 40
Ploughing (man and 2 horses 10 hrs. at 45 cts.)	$ 4 50	
Harrowing (man and 2 horses 2·75 hours at 45 cts.)	1 24	
Seeding (man and 2 horses 2·25 hours at 45 cts.)	1 01	
Rolling (man and 2 horses ·62 hours at 45 cts.)	0 28	
Cutting (man and 2 horses 1·5 hours at 45 cts.)	0 68	
Stooking and spreading stooks (man 2·06 hours at 25 cts.)	0 52	
Drawing to thresher (man and 2 horses 1·5 hours at 45 cts.)	0 68	
Pitching (man 1·5 hours at 25 cts.)	0 38	
	9 29	9 29
Threshing 22·5 bushels at 10 cts.		2 25
Total cost per acre		31 48
Value per acre 22·5 bushels wheat at $1.78	40 05	
1·31 tons straw at $2	2 62	
Total value per acre	42 67	42 67
Profit per acre		11 19

Cost per bushel grain $1.31
" ton straw $1.47

COST OF PRODUCING BARLEY IN A FOUR-YEAR ROTATION

On May 22 two acres of land which had been in hoed crop the previous year was sown with Charlottetown No. 80 barley. The barley was cut on September 10. The cost of production per acre was as follows:—

Rent and taxes		$ 3 00
Manure—30 per cent of 15 tons at $2 per ton		9 00
Fertilizer—141 pounds superphosphate at $1·095 per cwt.		1 54
Seed—2 bushels at $125 per bushel		2 50
Machinery		3 00
Twine—2 pounds at 16 cents		0 32
Ploughing (man and 2 horses 10 hours at 45 cts.)	$ 4 50	
Harrowing (man and 2 horses 2·85 hours at 45 cts.)	1 28	
Seeding (man and 2 horses 2·25 hours at 45 cts.)	1 01	
Cutting (man and 2 horses 1·5 hours at 45 cts.)	0 68	
Stooking and spreading stooks (man 2 hours at 25 cts.)	0 50	
Drawing to thresher (man and 2 horses 1 hour at 45 cts.)	0 45	
Pitching (man 1 hour at 25 cts.)	0 25	
	8 67	8 67
Threshing 34 bushels at 10 cts		3 40
Total cost per acre		31 43
Value per acre 34 bushels barley at $1	$ 34 00	
·78 tons straw at $4	3 12	
Total value per acre	$ 37 12	37 12
Profit per acre		5 69

Cost per bushel grain 84·6 cts.
" ton straw $3.38.

COST OF PRODUCING SUCCULENT FEED FROM DIFFERENT SOURCES

This experiment has been carried on the past three years in order to compare the cost of production and yield per acre of corn, sunflowers, turnips, and oats and peas.

This year the crops were grown on clay loam which had been in hay the two previous years. The land was ploughed in August and ploughed again late in the fall. In the spring the land was prepared for the crop with a stiff tooth cultivator, disc and smoothing harrow. Each acre was given an application of fifteen tons barnyard manure and 1,000 pounds 4-8-6 home-mixed fertilizer. Owing to the heavy nature of the soil the crops were not sown until June. The results are shown in the following table:—

Variety: Banner Oats and Canadian Beauty Peas.
Date of seeding: June 5.
Date of harvesting: August 12.

Rent and taxes		$ 3 00
Manure—40 per cent of 15 tons at $2 per ton		12 00
Fertilizer—166·6 pounds nitrate of soda at $3·095 per cwt.		5 16
100 pounds sulphate of ammonia at $3·845 per cwt.		3 84
125 pounds superphosphate at $1·095 per cwt.		1 37
120 pounds muriate of potash at $1·845 per cwt.		2 21
Seed—2 bushels oats at $1; 1 bushel peas at $3		5 00
Machinery		3 00
Ploughing (man and tractor 4·06 hours at 63 cts.)	$ 2 56	
Ploughing (man and 2 horses 5·31 hours at 45 cts.)	2 39	
Ploughing (man and oxen 3·12 hours at 45 cts.)	1 40	
Harrowing (man and tractor 3·06 hours at 63 cts.)	1 93	
Harrowing (man and 2 horses 7·25 hours at 45 cts.)	3 26	
Harrowing (man and 4 horses 2·62 hours at 65 cts.)	1 70	
Sowing fertilizer (man 5 hours at 25 cts.)	1 25	
Seeding (man and 2 horses 0·75 hours at 45 cts.)	0 34	
Cutting (man and 2 horses 2·5 hours at 45 cts.)	1 12	
Drawing to silo (man and 2 horses 3·75 hours at 45 cts.)	1 69	
Loading, unloading and tramping in silo (man 7·5 hours at 25 cts.)	1 87	
Filling silo (man and tractor 1·25 hours at 63 cts.)	0 79	
	$ 20 30	20 30
Rent of silage cutter and blower 1·25 hours at 40 cts		0 50
Total cost per acre		56 38
Value per acre 6·925 tons at $3.48	$ 24 10	24 10
Loss per acre		32 28

Cost per ton $8.14.

Corn

Variety: Longfellow.
Date of seeding: June 5.
Date of harvesting: September 15.

Rent and taxes		$ 3 00
Manure—40 per cent of 15 tons at $2 per ton		12 00
Fertilizer—166·6 pounds of nitrate of soda at $3·095 per cwt		5 16
100 pounds sulphate of ammonia at $3·845 per cwt		3 84
250 pounds superphosphate at $1·095 per cwt		2 74
120 pounds muriate of potash at $1·845 per cwt		2 21
Seed—30 pounds corn at $2.50 per bushel of 56 pounds		1 34
Machinery		3 00
Twine—4 pounds at 16 cts. per pound		0 64
Ploughing (man and tractor, 4·06 hours at 63 cts.)	$ 2 56	
Ploughing (man and 2 horses, 5·31 hours at 45 cts.)	2 39	
Ploughing (man and 2 oxen, 3·12 hours at 45 cts.)	1 40	
Harrowing (man and tractor, 3·06 hours at 63 cts.)	1 93	
Harrowing (man and 2 horses, 7·25 hours at 45 cts.)	3 26	
Harrowing (man and 4 horses, 2·62 hours at 65 cts.)	1 70	
Sowing fertilizer (man, 3 hours at 25 cts.)	0 75	
Seeding (man and 2 horses, 1·5 hours at 45 cts.)	0 68	
Cultivating (3 times) (man and 2 horses, 4·5 hours at 45 cts.)	2 02	
Cultivating (twice) (man and 1 horse, 3 hours at 35 cts.)	1 05	
Cutting (man and 2 horses, 2 hours at 45 cts.)	0 90	
Drawing to silo (man and 2 horses, 11·25 hours at 45 cts.)	5 06	
Loading, unloading and tramping in silo, 30 hours at 25 cts.)	7 50	
Filling silo (man and tractor, 3·75 hours at 63 cts.)	2 36	
	$ 33 56	33 56
Rent of silage cutter and blower, 3·75 hours at 40 cts		1 50
Total cost per acre		68 99
Value per acre, 18·31 tons at $2.51		45 96
Loss per acre		23 03

Cost per ton, $3.76.

Sunflowers

Variety: Giant Russian.
Date of seeding: June 6.
Date of harvesting: September 9.

Rent and taxes		$ 3 00
Manure—40 per cent of 15 tons at $2 per ton		12 00
Fertilizer—166·6 pounds nitrate of soda at $3·095 per cwt		5 16
100 pounds sulphate of ammonia at $3·845 per cwt		3 84
362 pounds superphosphate at $1·095 per cwt		3 96
120 pounds muriate of potash at $1·845 per cwt		2 21
Seed—18 pounds at 10 cts. per pound		1 80
Machinery		3 00
Twine—4 pounds at 16 cts. per pound		0 64
Ploughing (man and tractor, 4·06 hours at 63 cts.)	$ 2 56	
Ploughing (man and 2 horses, 5·31 hours at 45 cts.)	2 39	
Ploughing (man and 2 oxen, 3·12 hours at 45 cts.)	1 40	
Harrowing (man and tractor, 3·06 hours at 63 cts.)	1 93	
Harrowing (man and 2 horses, 7·25 hours at 45 cts.)	3 26	
Harrowing (man and 4 horses, 2·62 hours at 65 cts.)	1 70	
Sowing fertilizer (man, 3 hours at 25 cts.)	0 75	
Seeding (man and 2 horses, 1·5 hours at 45 cts.)	0 68	
Cultivating (3 times) (man and 2 horses, 4·5 hours at 45 cts.)	2 02	
Cultivating (twice) (man and 1 horse, 3 hours at 35 cts.)	1 05	
Cutting (man and 2 horses, 2·5 hours at 45 cts.)	1 13	
Drawing to silo (man and 2 horses, 11·25 hours at 45 cts.)	5 06	
Loading, unloading and tramping in silo (man, 30 hours at 25 cts.)	7 50	
Filling silo (man and tractor, 5 hours at 63 cts.)	3 15	
	$ 34 58	34 58
Rent of silage cutter, 5 hours at 40 cts		2 00
Total cost per acre		$ 72 19
Value per acre, 20·68 tons at $2.20		45 50
Loss per acre		26 69

Cost per ton, $3.49.

Swede Turnips

Variety: Bangholm Nappan.
Date of seeding: June 11.
Date of harvesting: October 24

Rent and taxes		$ 3 00
Manure—40 per cent of 15 tons at $2 per ton		12 00
Fertilizer—166·6 pounds nitrate of soda at $3·095 per cwt		5 16
100 pounds sulphate of ammonia at $3·845 per cwt		3 84
160 pounds superphosphate at $1·095 per cwt		1 75
120 pounds muriate of potash at $1·845 per cwt		2 21
Seed—1 pound at 50 cts. per pound		0 50
Machinery		3 00
Ploughing (man and tractor, 4·06 hours at 63 cts.)	$ 2 56	
Ploughing (man and 2 horses, 5·31 hours at 45 cts.)	2 39	
Ploughing (man and 2 oxen, 3·12 hours at 45 cts.)	1 40	
Harrowing (man and tractor, 3·06 hours at 63 cts.)	1 93	
Harrowing (man and 2 horses, 7·75 hours at 45 cts.)	3 49	
Harrowing (man and 4 horses, 2·62 hours at 65 cts.)	1 70	
Sowing fertilizer (man, 5 hours at 25 cts.)	1 25	
Ridging (man and 2 horses, 4 hours at 45 cts.)	1 80	
Seeding (man and 1 horse, 1 hour at 35 cts.)	0 35	
Thinning (man, 34 hours at 25 cts.)	8 50	
Cultivating (5 times) (man and 1 horse, 7·5 hours at 35 cts.)	2 63	
Pulling, loading and unloading (man, 35 hours at 25 cts.)	8 75	
Drawing to cellar (man and 2 horses, 20 hours at 45 cts.)	9 00	
	45 75	45 75
Total cost per acre		$ 77 21
Value per acre, 21·25 tons at $2.45		52 06
Loss per acre		25 15

Cost per ton, $3.63.

COST OF PRODUCTION SUMMARY—SUCCULENT FEEDS

	Corn	Sunflowers	*Oats and Peas	Swedes
Rent, taxes, manure, fertilizer and machinery $	31·95	33·17	30·58	30·96
Preparation of land $	13·99	13·99	14·49	16·52
Seeding $	0·68	0·68	0·34	0·35
Seed $	1·34	1·80	5·00	0·50
Cultivation and thinning $	3·07	3·07	.....	11·13
Harvesting and storing $	17·32	18·84	5·97	17·75
Twine $	0·64	0·64	.....	.....
Total cost per acre $	68·99	72·19	56·38	77·21
Yield per acre, green weight ton	18·31	20·68	26·92	21·25
Yield per acre, dry weight ton	2·87	2·85	1·50	3·25
Cost per ton, green weight $	3·76	3·49	8·14	3·63
Cost per ton, dry weight $	24·03	25·32	37·58	23·75

*The past two years ½ bushel vetches were sown in mixture. Vetches have been a total failure, therefore they were omitted this year.

RATES OF SEEDING WHEAT

The testing of rates of seeding Marquis wheat begun in 1923 was continued this year. The object of this experiment is to ascertain which rate of seeding will give the largest yield under New Brunswick conditions. Duplicate 1/110 acre plots were sown with Marquis wheat at the rates of one and one-half, two and two and one-half bushels per acre. The wheat was sown on May 21 and cut on August 27. The yields are shown in the following table:—

MARQUIS WHEAT—RATE OF SEEDING

Rate of seeding	Yield of grain per acre		Yield of straw per acre
	bush.	lb.	lb.
1½ bush.	13	27	743
2 "	16	13	1,402
2½ "	15	12	1,313

During the two years this test has been conducted, plots sown at the rate of two bushels per acre have given the highest yield, and plots sown at the rate of one and one-half bushels per acre have given the lowest yield. Therefore, judging from two years' results, seeding at approximately two bushels per acre will give the best results for this district.

RATES OF SEEDING OATS

This experiment has been carried on the past three years in order to obtain data on the effect rates of seeding have on the yield of grain and straw. Duplicate 1/110 acre plots were sown with Banner oats on May 21. The plots were cut on September 27-29. The yields are shown in the following table:—

BANNER OATS—RATES OF SEEDING

Rates of seeding	Yield of grain per acre	Yield of straw per acre
bush.	bush. lb.	lb.
2	42 22	1,190
2·5	40 20	1,480
3	46 20	1,386
3·5	47 19	1,188
4	38 27	1,063

The light yield of straw this year was largely due to the dry season.

Seeding at the rate of three and one-half bushels per acre gave a slightly higher yield of grain this year. Seeding at the rate of three bushels per acre, however, has given higher average yields of grain for the three years that the experiment has been conducted.

DATES OF SEEDING OATS

In order to ascertain whether early, medium, or late seeding of oats will give the largest yields under New Brunswick conditions, duplicate 1/110 acre plots were sown with Banner oats at the rate of three bushels per acre on three different dates. The results are shown in the following table:—

BANNER OATS—DATES OF SOWING

Date of sowing	Date of ripening	Number of days maturing	Yield of grain per acre	Yield of straw per acre
			bush. lb.	lb.
May 21	Aug. 27	98	46 20	1,386
June 2	Sept. 3	93	55 29	1,731
June 13	Sept. 20	99	44 28	x

x Weight of straw lost.

HORTICULTURE

ORCHARD, 1924

The orchard came through the winter in fairly good condition. A good many trees, principally of the Fameuse variety, developed an unthrifty appearance during the summer and made little, if any growth. This was probably due in part to the severe weather conditions during the winter of 1922-23. The area affected was principally on the trunk and main branches in the region of the crotches. The spring was late and the orchard did not come into full bloom until the 7th of June.

On May 8 an application of home-mixed 5-8-6 fertilizer was applied at the rate of 9 pounds per tree. Nitrate of soda, acid phosphate and muriate of potash were the materials used in this mixture. Barnyard manure at the rate of 10 tons per acre was applied to the commercial and variety orchards in the early spring.

The commercial, variety, and part of the cultural orchards were dusted this year instead of sprayed. A " Perfect Duster " mounted on a sloven, and engine driven, was used for this work. The applications made were as follows:—

May 29, 12-8-80 Copper arsenic dust.
June 14, 90-10 Sulphur-lead arsenate dust.
July 2, 12-8-80 Copper arsenic dust.

SPRAYING AND DUSTING EXPERIMENT

Orchard spraying and dusting experiments have been carried on at this Station in co-operation with the Entomological Branch for four years. The McIntosh and Fameuse varieties have been used for these experiments. The spray and dust calendars used were as follows:—

Spray Calendar

1st spray: Applied when blossom buds are showing pink.
Materials: 3-10-40 Bordeaux plus 1½ lbs. arsenate of lime.
2nd spray: Applied when blossoms have fallen.
Materials: wetable sulphur 12 lbs. lead arsenate 2 lbs. to 40 gallons water, or soluble sulphur 1 lb., arsenate of lime ½ lb. to 40 gallons of water.
3rd spray: Applied two weeks after blossoms have fallen.
Materials: 3-10-40 Bordeaux plus 1½ lbs. arsenate of lime.

Dust Calendar

1st application Applied when blossom buds are showing pink.
Materials: 12-8-80 copper arsenate dust 50 lbs. per acre.
2nd application: Applied when blossoms have fallen.
Material: 90-10 sulphur-lead arsenate dust, 75 lbs. per acre.
3rd application: Applied two weeks after blossoms have fallen.
Materials: 12-8-80 copper arsenate dust 50 lbs. per acre.

A fourth application of Bordeaux spray and Bordeaux dust was applied in 1922 and 1923 during the latter part of July. The results of this spraying and dusting experiment to date are indicated in the accompanying table.

Spraying and Dusting Experiment

Year	Spray calendar			Dust calendar			Check		
	Scab	Insect injury	Russet	Scab	Insect injury	Russet	Scab	Insect injury	Russet
	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.
McIntosh—									
1921	8·0	6·0	70·0	0	8·0	2·12	2·1	14·7	0
1922	6·28	8·29	41·1	11·54	3·72	30·40	64·59	18·71	0
1923	8·9	10·6	6·4	16·9	3·4	0·8	52·5	14·3	0
1924	10·4	5·5	8·4	36·1	3·6	0·4	91·6	5·9	0
Fameuse—									
1921	0	2·4	9·7	0	3·0	7·6	0·53	12·17	0
1922	1·41	5·1	51·11	1·24	4·67	31·36	12·11	28·9	0
1923	0	15·0	4·5	1·5	7·4	1·7	4·8	22·0	0
1924	7·4	4·3	2·2	13·3	4·2	0·4	71·5	4·6	0
Average, 2 varieties—									
1921	4·0	4·2	39·8	0	5·5	4·86	1·31	13·43	0
1922	3·84	6·69	46·1	6·39	4·19	30·88	38·35	23·8	0
1923	4·4	12·8	5·4	9·2	5·4	1·2	28·6	18·1	0
1924	8·9	4·9	5·3	24·7	3·9	0·4	81·5	5·2	0
Average, 2 varieties for 4 years	5·28	7·15	24·1	10·07	4·74	9·33	37·44	15·13	0

COMPARATIVE COSTS OF ORCHARD SPRAYING AND DUSTING

Cost of spraying for the season (three applications)—		
Number trees sprayed		43
Number trees in one acre		72
Amount 3-10-40 poisoned Bordeaux used		108 gal.
Amount wettable sulphur lead arsenate liquid used		55 gal.
Time for mixing and applying (three applications)		7 hours
Cost of materials—		
8 lbs. bluestone at 8c. per lb	$	0 64
27 lbs. hydrated lime at 1c. per lb		0 27
4 lbs. arsenate of lime at 25c. per lb		1 00
16 lb. wettable sulphur at 5c. per lb		0 80
3 lbs. arsenate of lead at 25c. per lb		0 75
Cost of labour—	$	3 46
14 man hours at 30c. per hour	$	4 20
7 team hours at 25c. per hour		1 75
Total cost: $9.41; Cost per tree: 21·8c.; Cost per acre: $15.75.	$	5 95
Cost of dusting for the season (three applications)—		
Number trees dusted		46
Number trees in one acre		72
Amount 12-8-80 copper arsenic dust used		56 lbs.
Amount 90-10 sulphur lead arsenate dust used		33 lbs.
Time for applying (three applications) 1 hour (58 min. to be exact).		
Cost of materials—		
56 lbs. 12-8-80 copper arsenic dust at 5·5c. per lb	$	3 08
33 lb. 90-10 sulphur lead arsenate dust at 7·5c. per lb		2 47
Cost of labour—	$	5 55
2 man hours at 30c. per hour	$	0 60
1 team hour at 25c. per hour		0 25
Total cost: $6.40; Cost per tree: 13·9c.; Cost per acre: $10.01.	$	0 85

Calculating from actual operation and costs of materials, spraying costs 7.9 cents more per tree or, as in this case, $5.68 per acre more than dusting.

This comparison was worked out on rather too small a scale to be a fair comparison of field tests. However, as the size of the operation increases the difference in costs should also increase in proportion.

COMMERCIAL ORCHARD

This orchard was planted in 1914 and includes the principal varieties grown commercially in the province. It remained in sod during the year. A swarth was cut on each side of the trees and left on the ground as a mulch. The remaining crop was allowed to grow and was cut for hay. The yields were as follows:—

YIELD FROM THE COMMERCIAL ORCHARD

Variety	Number of trees	Number of bearing trees	Total yield	Average yield per bearing tree
			pecks	pecks
New Brunswick	12	11	86·95	7·90
Alexander	23	18	166·6	9·25
Bethel	16	13	31·25	2·40
Dudley	23	23	288·2	9·92
McIntosh Red	12	9	58·0	6·44
Fameuse	26	26	338·7	13·02
Salome	3	1	3·6	3·6
Canada Baldwin	4	4	45·0	11·25
North Western Greening	4	3	26·8	8·93
Wolf River	15	13	96·1	7·39
Am. Golden Russet	15	12	55·7	4·64
Duchess	26	25	159·57	6·38
Milwaukee	29	27	327·6	12·1
Crimson Beauty	29	28	227·35	8·12
Wealthy	26	23	122·8	5·33
Red Astrachan	2	2	13·0	6·5
Yellow Bellflower	5	3	1·17	0·39

APPLES—VARIETY EXPERIMENT

This orchard remained in sod during the year, as in previous years. A swarth was kept cut on each side of the trees which was allowed to remain as a mulch. The remainder of the grass was cut for hay. A few new varieties were set out in the spring in place of some of the discarded varieties. The majority of the varieties in this orchard were originated at the Central Experimental Farm, Ottawa, by the Dominion Horticulturist.

There are two varieties in this orchard that are worthy of commercial recognition, Melba and Lobo.

The Melba is a McIntosh seedling. It is an apple of fair colour and good quality. It is ready for use about September 1. The tree is a strong vigorous grower and hardy.

Lobo is a McIntosh seedling. It is an apple of good size that is highly coloured and of good quality. It is of about the same season as the Wealthy. The tree is a strong vigorous grower and hardy.

It is possible that some of the other varieties will be of value to this province. Radnor is promising as a winter apple. It is a Swayzie seedling. The fruit is large, greenish-yellow, with a faint pink blush, firm and of good quality. The tree is a vigorous grower and hardy. It is possible that it has a tendency to bear in alternate years. A few of the Northern Spy seedlings are fairly good but further data are necessary.

APPLES—CULTIVATION VERSUS SOD CULTURE

This experiment was begun in 1922 with a block of the McIntosh, Dudley and Wealthy trees planted in 1914. One block is kept under cultivation until the first week in July, when a cover crop is sown.

A second block is cultivated on one side of the trees one year, and on the opposite side the following year. The cultivated area is sown for a cover crop during the first week in July and seeded down with clover.

A third block is kept in sod, and the grass cut and left on the ground as a mulch.

Nine pounds of a home-mixed 5-8-6 fertilizer was applied to each tree in this orchard on May 9.

The yields from the different blocks were as follows:—

ORCHARD CULTIVATED AND IN SOD

Variety	Method of treatment	Number of trees in block	Number bearing trees	Average yield per bearing tree
				pecks
McIntosh	Clean culture	5	5	7·6
	Partial cultivation	5	4	5·37
	Sod culture	6	5	7·6
Dudley	Clean culture	6	6	12·31
	Partial cultivation	10	8	13·26
	Sod culture	9	8	10·37
Wealthy	Clean culture	19	16	4·65
	Partial cultivation	19	12	2·58
	Sod culture	19	9	3·16

GRASS MULCH VERSUS REMOVING HAY IN SOD ORCHARD

This experiment has been carried on with Fameuse and McIntosh trees planted in 1914. On one block the grass is cut and left as a mulch, while on the second block it is cut and removed as hay.

The results were as shown in the following table:—

Variety	Treatment	Number of trees	Number of bearing trees	Total yield	Average Yield per bearing tree
				pecks	pecks
Fameuse	Grass cut and left as mulch	17	17	347·1	20·41
McIntosh	Grass cut and left as mulch	15	15	256·4	17·09
Fameuse	Grass cut and removed	27	26	456·8	17·56
McIntosh	Grass cut and removed	16	15	161·45	10·76

BUSH AND SMALL FRUITS

The bush fruit plantation was given an application of about 25 tons of barnyard manure per acre in the late autumn of 1923. Currants, gooseberries and raspberries came through the winter in good condition and yielded a fairly good crop.

The strawberry variety test was continued and a new plantation including the varieties under experiment was set out on May 29. The work this year, which was confined to variety tests, included the results from one-year and two-year-old plantations. The two-year-old plantation was weeded and cultivated after the crop was removed the previous year. No fertilizer or manure was applied for the second crop.

CURRANTS—VARIETY EXPERIMENT

Fourteen varieties of black currants were grown. Collins Prolific, with a yield of 15,730 quarts per acre, was the highest-yielding variety. It was followed by Clipper, Victoria, Black Champion and Buddenborg, in the order listed.

Fourteen varieties of red currants were grown. Rankins Red, with a yield of 16,843 quarts per acre, was the highest-yielding variety. It was followed by Wilder, Red Grape, Red Dutch and Cumberland, in the order listed.

Three varieties of white currants were grown, Large White, White Cherry, and White Grape. The yields were in the order named.

GOOSEBERRIES—VARIETY EXPERIMENT

Sixteen varieties of gooseberries were grown. Oregon Everbearing yielded 9,982 quarts per acre. It was followed by Keepsake, Pearl, May Duke, Downing and Whitesmith, in the order mentioned.

RASPBERRIES—VARIETY EXPERIMENT

Sixteen varieties of raspberries were grown. The best yield was procured by Herbert, 4,840 quarts per acre. It was followed by King, Newman No. 23, Newman No. 24, Newman No. 6, Newman No. 20, in the order named.

STRAWBERRIES—VARIETY EXPERIMENT

Thirty varieties of strawberries were grown. The crop from the year-old plantation was very light. On account of the dry weather the previous year, only a poor stand was obtained, which probably accounts for the small crop.

A good crop was produced on the two-year-old plantation. The second crop was larger than the first.

The yields from the year-old plantation were as follows:—

YIELDS FROM ONE-YEAR-OLD STRAWBERRY PLANTATION

Variety	Yield per acre	Variety	Yield per acre
	quarts		quarts
Glen Mary	7,136·2	Williams Improved	3,485·6
Ozark	5,898·7	Splendid	3,217·5
K. Premier	5,816·2	Senator Dunlap	3,135·0
Parsons Beauty	5,486·25	President	3,114·3
Lavinia	5,032·5	New York	3,093·7
Beder Wood	4,991·2	Julia	2,928·7
Sample	4,785·0	Bubach	2,660·6
Warfield	4,661·2	Jersey Giant	2,468·0
Billy Sunday	4,455·0	Black Beauty	2,371·8
Portia	4,413·7	K. Prize	2,323·7
Bianca	4,413·7	Brandywine	2,083·1
Cassandra	4,372·5	Americus	2,023·8
Charles I	4,042·5	Premier	1,739·3
Viola	4,001·2	Ophelia	1,629·3
Rewastico	3,712·5	Cordelia	1,283·8

YIELDS FROM THE TWO-YEAR-OLD PLANTATION FOR 1924, AND YIELDS FROM THE SAME PLANTATION IN 1923

Variety	Yield per acre, 1923	Yield per acre, 1924
	quarts	quarts
Ozark (Per)	6,275·8	7,445·6
K. Premier (Per)	6,171·0	6,785·6
Glen Mary (Per)	5,420·5	7,383·7
Senator Dunlap (Per)	5,298·6	6,558·7
K. Prize (Imp.)	5,046·7	6·703·1
Parsons Beauty (Per)	5,290·5	6,414·3
Beder Wood (Per)	5,639·9	6,012·1
Bianca (Per)	4,752·0	6,043·1
Warfield (Imp)	4,648·5	5,094·0
Bubach (Imp)	4,207·5	5,403·7
Portia (Imp)	3,894·0	5,610·0
Viola (Imp)	4,225·0	5,259·3
Billy Sunday (Per)	4,092·0	5,321·2
Cassandra (Per)	5,082·0	4,269·3
Lavinia (Per)	4,583·5	4,166·2
Charles I (Per)	3,943·5	4,702·5
William's Improved (Per)	4,022·7	4,382·8
Jersey Giant (Per)	4,042·5	3,918·7
Rewastico	4,648·5	3,258·7
Sample (Imp)	4,128·4	3,609·0
Julia (Per)	3,403·0	4,125·0
Black Beauty	3,160·5	3,939·3
President	3,547·0	3,286·2
Brandywine (Per)	3,242·5	3,341·2
Cordelia (Per)	1,950·4	4,310·6
Premier (Per)	2,978·2	3,052·5
Ophelia (Per)	3,003·0	2,722·0
Americus (Per)	3,366·0	2,120·0
Splendid (Per)	3,679·5	1,498·7
New York	1,527·8	2,124·3

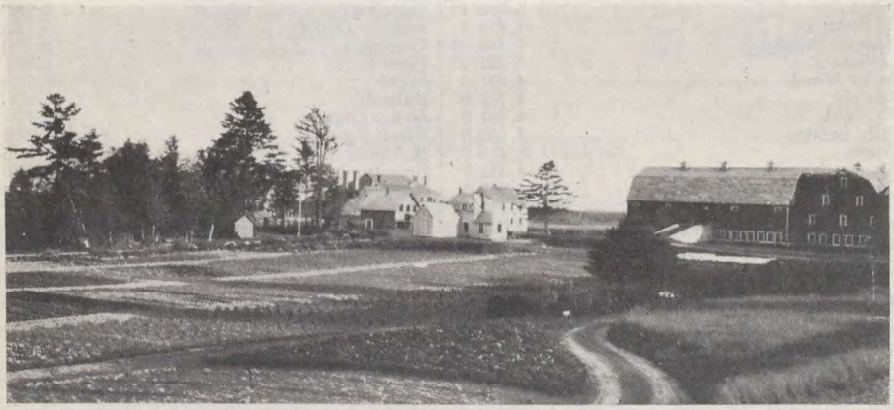
GRAPES—VARIETY TEST

The grapes were laid down in December of the previous year and covered with brush for the winter. They were uncovered May 2. Beta, Hartford, Wilkins, Moore, Diamond, Delaware and Early Daisy developed fruit that was fairly ripe. Of these varieties Hartford produced the largest yield with an average of 17.25 pounds per vine. It was followed by Wilkins, Beta and Delaware.

Judging from the results to date with the crop it would appear that this crop has no commercial value in this province.

VEGETABLES, 1924

The land devoted to vegetables was manured with barnyard manure at the rate of twenty tons per acre in the fall of 1923. This manure was ploughed under in the fall, and in the spring one thousand pounds per acre of a 4-8-6 commercial fertilizer was applied broadcast. The land was worked up for seeding with a stiff-toothed cultivator and harrows.



Farm buildings and garden, Fredericton Experimental Station.

BEANS

VARIETIES.—Twenty-five varieties of beans were planted in sixty-six-foot rows on the 30th of May. These rows were divided into two plots. Records were taken from one plot for the production of green beans and from the second plot for the production of ripe beans. The results were as shown in the following table:—

YIELD OF GREEN BEANS

Variety	Source	Amount Anthracnose	Ready for use	No. of plants 33 ft. row	Yield per 33 ft. row	
					lbs.	ozs.
Masterpiece	0-2746	None	July 30	120	40	4
Hodson Long Pod	0-2748	"	Aug. 12	107	38	6
Refugee	0-1631	"	" 12	126	37	2
Kentucky Wonder Wax	Will	"	" 12	141	37	2
Hodson Long Pod Wax	Rennie	"	" 12	164	34	13
Plentiful French	0-2824	Considerable	July 30	118	32	13
Sutton Masterpiece	Vaughan	None	" 30	124	31	14
Refugee	Steele-Briggs	Slight	Aug. 15	126	31	10
Hodson Wax	Harris	Very slight	" 12	150	30	8
Round Pod Wax	0-5232	Slight	July 30	94	29	14
Ex. Early Valentine	0-1479	Considerable	" 30	101	29	12
Stringless Green Pod	0-2747	"	" 30	92	29	10
Wardwell Kidney Wax	0-2823	None	" 30	127	29	6
Davis Wax	0-2772	Considerable	" 30	124	28	11
Bountiful Green Bush	0-2825	None	" 30	107	28	3
Wardwell Kidney Wax	Graham	Slight	" 30	143	28	1
Round Pod Kidney Wax	McDonald		" 30	109	27	4
Giant Stringless	Burpee	Considerable	" 30	149	26	11
Green Pod No. 1 Pole	0-5964	None	Aug. 6	91	26	7
Improved Golden Wax	Livingstone	Considerable	July 30	150	24	8
Pencil Pod Black Wax	Burpee	Slight	" 30	150	24	–
Yellow Eye Yellow Rod	0-2821	"	" 30	87	23	10
Extra Early Long Red Valentine	Steele-Briggs	"	Aug. 6	138	23	1
Challenge Black Wax	0-592	Considerable	July 29	112	18	13
Harlington Windsor	Steele-Briggs	None	Aug. 12	45	17	5

YIELD OF RIPE BEANS

Variety	Source	No. of plants 33 ft. row	Yield per 33 ft. row	
			lbs.	ozs.
Hodson Long Pod Wax	Rennie	154	5	14
Refugee	0-1631	139	5	12
Giant Stringless Green Pod	Burpee	173	5	10
Hodson Long Pod	0-2748	106	5	3
Hodson Wax	Harris	167	4	12
Refugee	Steele-Briggs	131	4	12
No. 1 Pole	0-5964	119	4	10
Ex. Early Long Red Valentine	Steele-Briggs	138	4	7
Round Pod Kidney Wax	McDonald	126	4	-
Sutton Masterpiece	Vaughan	122	4	-
Masterpiece	0-2746	127	4	-
Pencil Pod Black Wax	Burpee	155	3	14
Yellow Eye Yellow Pod	0-2821	102	3	13
Wardwell Kidney Wax	Graham	158	3	13
Bountiful Green Bush	0-2825	107	3	12
Ex. Early Valentine	0-1479	130	3	12
Plentiful French	0-2824	105	3	10
Kentucky Wonder Wax	Will	132	3	10
Round Pod Wax	0-5232	88	3	8
Stringless Green Pod	0-2747	113	3	8
Wardwell Kidney Wax	0-2823	118	3	3
Harlington Windsor	Steele-Briggs	47	3	-
Challenge Black Wax	0-592	120	3	-
Davis Wax	0-2772	120	2	13
Improved Golden Wax	Livingstone	154	2	11

DISTANCE APART IN THE ROW.—In order to determine the best distance apart to plant beans the Round Pod Kidney Wax and Stringless Green Pod varieties were planted two, four and six inches apart in rows two and one-half feet wide on May 30. The results were as follows:—

BEANS—DISTANCE APART OF PLANTING IN THE ROW

Variety	Distance apart of planting	Green Beans		Ripe Beans	
		Number plants	Yield per 33 ft. row	Number plants	Yield per 33 ft. row
	inches		lbs. ozs.		lbs. ozs.
Round Pod Kidney Wax	2	102	33 5	112	4 12
" "	4	62	32 9	62	4 8
" "	6	42	33 2	48	4 8
Stringless Green Pod	2	152	27 7	143	3 10
" "	4	72	22 4	78	4 0
" "	6	50	24 8	53	4 3

BEETS

VARIETIES.—Six varieties of beets were planted on May 22. A very thin stand was obtained, and the beets were too large in the fall to be merchantable. The Crosby Egyptian was the least objectionable in this regard.

A second sowing was made on June 25 and a fairly even stand was obtained. Early Wonder (Ewing) and Detroit Dark Red (O-3494) gave the highest yields, 121 pounds from a 66-foot row, followed by Detroit Dark Red (McDonald), Cardinal Globe (Rennie), Crosby Egyptian (Steele-Briggs), and Eclipse (McDonald) in the order mentioned.

DATES OF SEEDING.—In order to determine the date of seeding beets that will give the best results (1) for green bunch beets, (2) when left in the ground until fall, Detroit Dark Red beets were sown on May 22, June 2, June 12,

June 23 and July 2. Very poor stands were obtained from the earlier seedings. The largest crop of bunch beets was obtained from the June 23 sowing although the crop was rather late for early market. The largest crop the preceding year was obtained from a sowing made June 11.

The largest yield of merchantable table beets harvested in the fall was obtained from the sowing made June 23.

BRUSSELS SPROUTS—VARIETY EXPERIMENT

Three varieties of Brussels sprouts were sown in the hotbed on April 19 and transplanted in the open on May 28. The Dalkeith variety (McDonald) gave the largest yield, viz., 34 pounds from a 66-foot row, and was followed by Paris Market and Amager Market (Ewing) in the order named.

CARROTS

VARIETIES.—Four varieties of carrots were sown on May 22 in 66-foot rows. The largest yield of merchantable carrots was obtained from the Oxheart variety which yielded 64¼ pounds from a 66-foot row. It was followed by Selected Chantenay (McDonald).

DATES OF PLANTING.—In order to determine the date of sowing carrots that will give the best results (1) for green table carrots put up in bunches, and (2) when left in the ground until fall, Select Chantenay carrots were sown on May 22, June 2, June 12, June 23 and July 2. The largest yield of bunch carrots was obtained from the June 23 sowing, but the crop was rather late. The June 2 and June 12 sowings gave the largest yields up to the latter part of August. The June 12 sowing gave the largest yield of merchantable carrots when harvested in the fall.

The best yields the previous season were obtained from the June 11 planting.

CELERY

VARIETIES.—Fourteen varieties of celery were sown in the hotbed on April 21 and transplanted to trenches in the open on June 26. On account of the development of leaf spot and rot in the fall the crop was poor and of inferior quality.

Bordeaux spray was applied on July 29, August 12, August 22, and August 28, but apparently it is necessary to begin the spraying earlier in the season. The largest yield was obtained from French Success (Harris), 25 heads weighing 37 pounds. Paris Golden Yellow (Dupuy & Ferguson), New Emperor (Vaughan), and Easy Blanching (Graham) in the order named gave the next best yields.

METHOD OF BLANCHING.—In order to determine the best method of growing and blanching celery, Golden Self Blanching celery was planted (1) in a bed with the plants six inches apart each way in the bed, (2) on the level and blanched with earth, (3) on the level in a double row and blanched with paper, (4) in a trench and blanched with earth, (5) on the level and blanched with boards. The best yield was obtained where the crop was grown on the level and blanched with boards. The second best yield was obtained where the crop was grown on the level and blanched with earth, and the system of growing in a bed gave the third highest yield. The quality in all instances was poor on account of leaf spot and rot, but was in the same order as the yield.

CABBAGE

VARIETIES.—Thirteen varieties of cabbage were grown. Golden Acre (Harris) was the earliest variety. It was ready for use July 23. This was followed in order of earliness by Copenhagen Market (Graham), Early Jersey Wakefield (McDonald), Summer Ballhead (Harris), Succession (Ewing), and Early Winningstadt (Steele-Briggs). The Summer Ballhead, with heads averaging ten pounds, had the heaviest average heads for the early varieties. It was followed by Early Jersey Wakefield and Copenhagen Market, in the order named.

Extra Amager Danish Ballhead (O-3422), with heads averaging 11.39 pounds, had the heaviest average heads for the late varieties, and was followed by Danish Round Head (Dupuy & Ferguson) and Danish Ballhead (Steele-Briggs) in the order mentioned.

DATES OF PLANTING FOR STORAGE PURPOSES.—In order to determine the date of planting cabbage that will give the best results for storage purposes, Copenhagen Market and Danish Ballhead varieties were sown on different dates, harvested with the root on, and stored, in order to determine their keeping qualities. The results were as follows:—

DATES OF PLANTING AND STORAGE OF CABBAGE

Variety	Date sown outside	Date harvested	Remarks on keeping qualities
Copenhagen Market	May 13	Aug. 23	Decayed Oct. 3
" "	" 22	Sept. 2	" " 3
" "	June 2	" 2	" " 3
" "	" 12	" 22	" Dec. 1
" "	" 23	Oct. 2	50% decayed Dec. 18.
			100% " Jan. 28.
" "	July 4	" 18	Decayed Jan. 28
Danish Ballhead	May 3	Sept. 22	60% decayed Jan. 28
			100% " Mar. 2
" "	" 13	" 22	50% " Jan. 28
			100% " Mar. 2
" "	" 22	Oct. 18	Beginning to decay Mar. 2.
" "	June 2	" 18	Sound, Mar. 2
" "	" 23	" 18	Sound, Mar. 2

The results of this work for two years indicate that Copenhagen Market cabbage cannot be successfully stored here unless planted late. Plantings made early in the season develop heads that are liable to burst before storage time, and the late plantings of this variety do not keep as well as Danish Ballhead. The Danish Ballhead variety stores well. The later plantings apparently have a little longer storage season.

CAULIFLOWER—VARIETY EXPERIMENT

The Early Dwarf Erfurt and Early Snowball varieties were grown. The Early Dwarf Erfurt yielded the largest average head.

CORN—VARIETY EXPERIMENT

Fourteen varieties of corn were sown on May 22. The results were as follows:—

VARIETIES OF CORN

Variety	Source	Ready for use	Yield		Remarks
			ears	lbs.	
Pickaninny	0-2567	Aug. 20	122	24·5	Black, small cob. Good quality.
Ex. Early Adams	Ferry	" 25	63	32·06	White, large cob. Poor flavour.
Sweet Squaw	0-1445-7	" 30	100	49·56	White, fair flavour.
Pocohontas	Harris	" 30	89	54·12	White, fair quality.
Early Malcolm	0-860	" 30	122	54·25	White, fairly good quality.
Early Mayflower	McDonald	Sept. 3	79	49·68	White, large cobs. Fair flavour, coarse.
Malakoff	Vaughan	" 4	84	33·25	White, good flavour.
Buttercup	Harris	" 4	78	39·43	Yellow. Good quality.
Howling Mob	Burpee	" 5	100	67·06	
Golden Bantam Sel	McDonald	" 6	80	33·58	Yellow, good quality.
Golden Justice	Bruce	" 10	99	44·4	
Earliest Catawba	Burpee	" 10	89	37·5	
Whipples Yellow	Harris	" 10	85	53·43	Golden colour.
Early Fordhook	Burpee	" 10	87	59·62	Good quality.

EGG PLANT

The Extra Early Dwarf variety was grown and the first fruit was picked September 9. The seed was sown in the hotbed on April 21. This was the first year that a satisfactory crop of this vegetable has been grown at this Station, but there was no demand for it and the egg plant cannot be considered as being of any commercial value in the province.

LETTUCE—VARIETY EXPERIMENT

Twelve varieties of lettuce were grown. The Grand Rapids was the most in demand for a loose-leafed variety. Crisp as Ice and All Heart were the most popular head varieties.

MUSK MELON—VARIETY EXPERIMENT

Six varieties were sown on May 31 in a warm, rich, sandy loam. The young plants were rather slow in growing, and subject to insect injury. Consequently a poor stand was obtained. However, a fairly good crop was harvested on the 24th of September.

On the basis of weight per plant of merchantable-sized melons the Irondequoit (Vicks) produced the greatest weight, with an average of two melons per plant. Paul Rose (Steele-Briggs) was second in weight, with an average of five melons per plant. Heart of Gold was in third position with an average of four melons per plant. Emerald Gem was fourth with an average of five melons per plant.

PEPPERS—VARIETY EXPERIMENT

Three varieties of peppers were sown in the hotbed on April 19 and transplanted June 14. Harris Earliest (Harris) gave the best yield.

PARSNIPS

VARIETIES.—Four varieties were sown on May 22. Hollow Crown (McKenzie) produced the highest yield. It was followed by Hollow Crown (O-3421) and Cooper's Champion (Dupuy & Ferguson).

DATE OF SEEDING.—In order to determine the date of seeding parsnips that will give the best results, Hollow Crown Parsnips were sown on May 22, June 2, June 12, June 23 and July 2. The highest yields were obtained from the earlier sowings.

PUMPKINS—VARIETY EXPERIMENT

Six varieties of pumpkins were planted May 31. Connecticut Field (McDonald), King of Mammoth (Graham), and Sweet or Sugar (O-5548), in the order named, produced the largest yields.

PEAS

VARIETIES.—The varieties listed below were sown in 66-foot rows on May 10. The results were as shown in the following table, the yields being of green peas in the pod.

PEAS—VARIETY EXPERIMENT

Variety	Source	Ready for use	Yield per 66 ft. row	
			lbs.	ozs.
Seedling No. 1	Invermere	July 22	55	13
The Lincoln	Morse	" 17	50	3
Lincoln	Invermere	" 22	47	11
Seedling No. 16	Invermere	" 17	42	14
Advancer	0-1068-9	" 17	40	2
Advancer	Harris	" 22	40	1
American Wonder B	0-3332	" 17	39	8
Seedling No. 3	Invermere	" 17	39	7
Richard Seddon	MacKenzie	" 17	38	5
McLean Advancer	Harris	" 22	38	1
Seedling No. 8	Invermere	" 17	37	11
Telephone	D. and F	" 26	37	9
Seedling No. 2	Invermere	" 17	36	5
McLean Advancer X Gregory Surprise	0-2336	" 17	35	15
American Wonder	Graham	" 22	35	14*
English Wonder	0-2347	" 17	35	11
Danby Stratagem	0-5146	" 26	34	13
Gradus	0-2348	" 17	33	3
Blue Bantum	Graham	" 17	32	8
Gregory Surprise X English Wonder	0-2344	" 17	32	6
Daisy	Pat Moore	" 22	32	4
Gradus X American Wonder	0-3679	" 17	31	15
Thos. Laxton	McDonald	" 17	30	5
Prosperity	Rennie	" 17	29	14
Laxton Progress	0-2334	" 17	26	13
Laxtonian	Graham	" 17	21	14
Alaska	Vaughan	" 17	20	11

*Crop injured by birds.

DISTANCES OF PLANTING IN THE ROW.—In order to determine the distance apart of planting peas that will give the best results Thos. Laxton, English Wonder, and Stratagem peas were planted one, two and three inches apart in rows 2½ feet apart on May 10. The yields for the Thos. Laxton and Stratagem varieties were in favour of the closer plantings. For the English Wonder variety the wider plantings gave the best results.

In 1923 the closer plantings gave the highest yields.

SWISS CHARD—VARIETY EXPERIMENT

Two varieties, White Silver (Rennie) and Poires (Ewing), were sown on May 8. The White Silver produced the largest yield 104½ pounds from a 33-foot row. The first cutting was made on July 5 and cuttings were continued until October 2.

SALSIFY—VARIETY EXPERIMENT

Only one variety Mammoth Sandwich Island, was grown and the crop was of poor quality.

SQUASH—VARIETY EXPERIMENT

Five varieties of squash and two of vegetable marrow were sown on May 31. Warty Hubbard (Steele-Briggs) gave the highest yield 562 pounds from six hills. It was followed by Green Hubbard (Graham) and Golden Hubbard (McDonald). The Mammoth Long White was the highest-yielding marrow.

TOMATOES

VARIETIES.—The varieties listed below were planted in the hotbed April 19, and transplanted to the open June 10. The plants were set four feet apart in rows four feet wide and they were allowed to grow without pruning. The growth of vines was heavy and the amount of ripe fruit produced early in the season was small. The yields from eight plants in a 33-foot row were as shown in the accompanying table.

TOMATOES—VARIETY EXPERIMENT

Variety	Source	Ripe to Aug. 30		Ripe Aug. 30 to Sept. 15		Ripe Sept. 15 to Sept. 30		Total ripe		Green		Total crop	
		lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.
Sparks Earliana	McDonald	6	13	37	2	96	8	140	7	65	–	205	7
Avon Early	Vaughan	8	15	29	1	100	–	138	–	146	8	284	8
Sunnybrook Earliana	Burpee	7	3	26	14	96	–	130	1	106	–	236	1
Alacrity X Earlibell	0-3035	7	6	38	1	84	–	129	7	72	–	201	7
Earliest Market	Buckbee	7	10	26	5	91	4	125	3	113	8	238	11
Alacrity X Hipper	0-3040	12	11	49	15	60	–	122	10	28	–	150	10
Alacrity 4-9-2	0-5467	5	7	17	15	87	–	110	6	150	8	260	14
Bonnie Best	Keith	4	13	16	1	84	8	105	6	219	–	324	6
Earliana	Ferry	–	12	14	1	85	–	99	13	147	–	246	13
Fifty Day	Buckbee	3	7	22	1	70	–	95	8	99	8	194	8
Burbank	Bruce	5	10	20	5	67	–	92	15	79	–	171	15
Sparks Earliana	Ewing	5	13	11	7	70	–	87	4	110	–	197	4
Danish Export	Wibbolt	8	8	24	6	42	8	75	6	147	8	222	14
Sparks Earliana	Burpee	6	6	13	7	52	–	51	13	157	8	229	5
First of All	Mackenzie	4	9	11	11	53	8	69	12	141	–	210	12
Red Head	Langdon	7	1	8	15	45	8	61	8	148	–	209	8
Pink Plant 1	0-3039	6	–	15	7	35	8	56	15	112	–	168	15
John Baer	Steele-Briggs	–	4	6	7	45	8	52	3	179	–	231	3
Early Mascot	Graham	–	13	11	5	40	–	52	2	168	–	220	2
Chalks Early Jewel	Steele-Briggs	1	2	8	11	38	8	48	5	160	–	208	5
Prosperity	Patmore	1	2	9	1	32	8	42	11	239	–	281	11
Bonney Best	Stokes	3	13	17	14	15	8	36	11	213	8	250	3
New Albino	D. and F	–	–	–	–	25	8	25	8	252	8	278	–
Early Detroit	Ferry	–	4	4	5	18	8	23	1	183	–	206	1
Gulf State Market	Ferry	–	–	3	–	18	8	21	8	175	8	197	–
Rosy Morn	Livingston	–	–	3	–	17	–	20	–	155	8	175	8
Prosperity	Buckbee	–	8	–	13	13	12	15	1	141	–	156	1
Matchless	Livingston	–	–	–	–	8	6	8	6	152	8	160	14
Bonny Best Super Standard	Stokes	–	10	1	15	3	7	6	–	112	–	118	–
Matchless	Burpee	–	–	–	–	4	2	4	2	150	–	154	2
Self Pruning	Burpee	–	–	–	–	4	–	4	–	138	–	142	–
Norton	Livingston	–	–	–	–	3	11	3	11	126	–	129	11
Coreless	Livingston	–	–	–	–	3	1	3	1	136	–	139	1
Stone	Livingston	–	–	–	–	2	15	2	15	135	8	138	7

METHODS OF TRAINING.—In order to determine the best method of pruning tomatoes to one stem, the Alacrity and Bonny Best varieties were planted in the hotbed on April 19 and transplanted in the open on June 10. These were planted one foot apart in rows two feet wide. The yields from 25 plants were as shown in the following table:—

TOMATOES—METHOD OF PRUNING. YIELD FROM 25 PLANTS

Treatment	Ripe to Aug. 30		Ripe Aug. 30 to Sept. 15		Ripe Sept. 15 to Sept. 30		Total Ripe		Total Green		Total Crop	
	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.
Alacrity—												
Single stem, not headed back	37	10	42	1	30	8	110	3	23	..	133	3
Single stem, stopped at 3rd truss fruit	46	15	29	9	4	..	80	8	..	..	80	8
Single stem, stopped at 2nd truss fruit	25	15	24	6	5	..	55	5	..	..	55	5
Single stem, stopped at 1st truss fruit	25	11	1	4	..	..	26	15	..	..	26	15
Bonny Best—												
Single stem, not headed back	20	1	52	10	29	8	102	3	44	8	146	11
Single stem, stopped at 3rd truss fruit	17	10	38	6	21	8	77	8	5	8	83	..
Single stem, stopped at 2nd truss fruit	16	12	29	5	13	..	59	1	6	..	65	1
Single stem, stopped at 1st truss fruit	25	11	12	8	1	8	39	11	..	..	39	11

The results of two years' experiments show that the single stem not headed back gives the largest crop of ripe tomatoes as well as the largest total crop. Pruning the single stem back to the 1st, 2nd, or 3rd truss of fruit has in some instances given a little more ripe fruit earlier in the season.

WATERMELON—VARIETY EXPERIMENT

Only one variety of watermelon, Monte Cristo, was grown. The seed was sown in the open on May 31. A very poor stand was obtained but a few fairly good melons developed.

VEGETABLES—AUTUMN VERSUS SPRING SOWING

In order to determine the results from planting vegetable seeds in the autumn, seeds of the varieties of vegetables listed were planted on November 6, 1923. The soil was a medium clay loam and had been well manured and fertilized the previous spring for the vegetable crop. The results were as follows:—

AUTUMN AND SPRING SOWING OF VEGETABLES

Vegetable	Variety	Results
Beet	Detroit Dark Red	Poor stand. Few beets grew and went to seed early.
Carrot	Chantenay	Fair stand. Fairly good crop.
Cabbage	Copenhagen Market	Did not germinate.
Lettuce	Grand Rapids	Fair stand. Not any earlier than spring planting, and lettuce tough.
Onion	L. Red Wethersfield	Did not germinate.
Radish	Scarlet Turnip White Tip	Poor stand, and crop poor in quality.
Turnip	Early Purple Top Milan	Very poor stand.
Peas	Stratagem	Poor stand, 10 days earlier than spring grown crop.
Peas	Thos. Laxton	Poor stand, 10 days earlier than spring grown crop.
Peas	Gradus	Poor stand, 10 days earlier than spring grown crop.

STRAIN TEST.—Four strains of Irish Cobblers, four strains of Green Mountains, one strain of Browns No. 1 and a new variety, Hoben, originated by Fred A. Hoben of Upper Gagetown, were grown in a comparative test during the year. The seed was planted on June 3, in a medium clay loam, fertilized with fifteen tons of barnyard manure and 1,000 pounds of 4-8-6 fertilizer. The sets were planted with an Iron Age planter, and the diseased plants were rogued out as they appeared. Black Leg was the most prevalent potato disease and the Cobblers had a heavier infection than the Mountains. The actual yields per acre from each plot after rogueing were as shown in the following table:—

STRAIN TEST OF POTATOES

Grower's No.	Yield per acre on rows taken from percentage stand			
	Per cent stand	Merchantable	Small	Total
		lb.	lb.	lb.
	Irish Cobblers—			
No. 4	79·28	19,501	1,593	21,094
No. 3	77·93	17,881	806	18,687
No. 2	72·45	16,294	1,956	18,250
No. 1	75·69	14,963	1,815	16,778
	Green Mountains—			
No. 8	73·4	23,191	1,371	24,563
No. 5	80·0	22,748	1,512	24,260
No. 7	59·1	20,912	1,028	21,941
No. 6	68·5	17,948	2,178	20,126
	Browns No. 1—			
No. 9	80·2	24,946	1,230	26,176
	Hoben—			
No. 10	80·7	22,425	3,065	25 490

DATES OF PLANTING TO OBTAIN BEST YIELD.—In order to obtain data on the date of planting potatoes that will give the best yield Green Mountain and Irish Cobbler potatoes were planted on the dates shown in the following table. The soil was a sandy loam manured with fifteen tons of barnyard manure and 1,000 pounds of 4-8-6 commercial fertilizer. The results were as follows:—

DATES OF PLANTING

Variety	Date planted	Yield per acre		
		Merchantable	Small	Total
		lb.	lb.	lb.
Irish Cobblers	May 16	23 562	1.716	25,278
	" 26	22,440	1,914	24,354
	June 5	19,668	2,904	22,572
	" 15	17,622	4,356	21,978
	" 25	12,672	3,168	15,840
Green Mountain	May 16	29,766	858	30,624
	" 26	22,374	1,122	23,496
	June 5	24,024	1,848	25,872
	" 15	23,430	2,574	26,004
	" 25	12,276	2,442	14,718

In 1923 the first planting was made on May 26, and the yield from the Cobblers was in favour of the earlier plantings. Only two plantings of Mountains were made that year, May 26 and June 25. The yields were in favour of the earlier planting.

SPROUTED VERSUS UNSPROUTED FOR EARLINESS AND YIELD.—On April 3 a small lot of Green Mountain and Irish Cobbler potatoes were taken from the cellar and kept in a room where the temperature was between 40 and 50 degrees F. and the light subdued. They were kept there until May 15 in order to develop thick, short, green sprouts. The Mountains developed good sprouts, but the Cobblers did not develop as well. On May 16 these were cut into sets and planted in comparison with a similar lot of potatoes that had been kept in the potato cellar the object being to determine the effect of sprouting in this manner on earliness and yield. These potatoes were grown on a sandy loam, fertilized with fifteen tons of barnyard manure and 1,000 pounds of a 4-8-6 commercial fertilizer. The results were as follows:—

POTATOES—SPROUTED VERSUS UNSPROUTED

Variety	Date dug	Yield per acre					
		With sprouts			Without sprouts		
		Merchantable	Small	Total	Merchantable	Small	Total
		lb.	lb.	lb.	lb.	lb.	lb.
Irish Cobblers	Aug. 8	15,873	1,617	17,490	14,883	1,683	16,566
"	Sept. 0	23,694	1,749	25,443	25,344	1,551	26,895
Green Mountains	Aug. 15	24,552	759	25,311	15,906	825	16,731
"	Oct. 15	32,868	858	33,726	25,674	660	26,334

During the two years that this experiment has been carried on the crop from the sprouted potatoes could have been dug a week earlier than that from the unsprouted lots. The results also indicate that the sprouting may increase the yield, but it is hardly likely that the increase will justify the practice commercially on account of the labour involved in planting the sets by hand. Where potatoes are grown for an early market or for home use, sprouting will be found advantageous.

MATURE VERSUS IMMATURE POTATOES FOR SEED PURPOSES.—In order to determine the relative value of mature and immature potatoes for seed purposes the progeny of Irish Cobbler and Green Mountain potatoes planted on different dates in 1923 were planted in comparison on May 16. The soil was a sandy loam manured with fifteen tons barnyard manure and 1,000 pounds of 4-8-6 commercial fertilizer. The results were as shown in the following table:—

Variety	Date planted 1923	Date dug 1923	Time in ground 1923	Yield per acre		
				Merchantable	Small	Total
			days	lb.	lb.	lb.
Irish Cobblers	May 26	Aug. 16	82	18,480	1,848	20,328
	" 26	Sept. 17	114	17,238	2,294	19,532
	June 5	" 17	104	16,368	2,442	18,810
	" 15	" 17	94	24,288	1,584	25,872
	" 25	" 17	84	19,800	1,650	21,450
Green Mountains	May 26	Aug. 31	97	24,948	1,584	26,532
	" 26	Oct. 12	139	25,344	1,584	26,928
	June 25	" 12	109	23,223	1,584	24,816

During the three years that this experiment has been carried on with Irish Cobblers, immature seed has always given a slightly larger crop than mature seed.

This experiment has only been carried on two years with the Green Mountain variety and in the previous experiment the mature seed gave a larger yield than the immature seed.

SMALL VERSUS LARGE POTATOES FOR SEED PURPOSES.—In order to determine the value of the smaller potatoes for seed purposes, potatoes weighing an average of 2.2 ounces were planted whole in camparison with sets weighing 2.2 ounces cut from potatoes of commercial size weighing an average of 5.2 ounces. The variety used was Green Mountain. They were planted in a sandy loam, fertilized with fifteen tons barnyard manure and 1,000 pounds of 4-8-6 commercial fertilizer per acre. The results were as shown in the following table:—

SMALL AND LARGE POTATOES FOR SEED

Kind of Seed	Yield per acre		
	Merchantable	Small	Total
	lb.	lb.	lb.
Seconds planted whole	38,789	2,579	41.368
Commercial size cut in sets	39,397	2,177	41,574

The results during the two previous years were somewhat in favour of the smaller-sized seed. It must be borne in mind that the small potatoes used were produced by crops free from physiological diseases such as Leaf Roll and Mosaic.

In order to determine if the continued planting of the smaller-sized potatoes would result in a deterioration of the crop, potatoes of commercial size weighing an average of 5.2 ounces, grown from potatoes of commercial size, were cut in sets weighing 2.2 ounces on the average. These were planted (1) in comparison with potatoes weighing an average of 2 ounces grown from potatoes weighing an average of 3 ounces, and (2) in comparison with potatoes weighing an average of 2.2 ounces grown from potatoes weighing an average of 1.5 ounces. The small potatoes were planted whole. The Green Mountain variety was used for this experiment and the method of fertilization and character of the soil were as noted in the previous paragraph. The results were as shown in the following table: —

CONTINUED USE OF SMALL POTATOES FOR SEED

Kind of Seed Used	Yield per Acre		
	Merchantable	Small	Total
	lb.	lb.	lb.
Commercial-sized potatoes from potatoes of commercial size	39,397	2,177	41,574
2 oz. potatoes grown from 3 oz. potatoes	37,220	3,001	40,221
2·2 oz. potatoes grown from 1·5 oz. potatoes	38,633	2,368	41,001

While the results are in favour of the larger potatoes the difference is slight.

In order to determine the results from the selection of commercial-sized potatoes grown from different-sized potatoes, potatoes weighing an average of 5.2 ounces were selected from a crop grown from 8-ounce potatoes; potatoes averaging 5.4 ounces were selected from a crop grown from 3-ounce potatoes; potatoes weighing an average of 6.4 ounces were selected from a crop grown from 1.5-ounce potatoes. The Green Mountain variety, cut in sets weighing 2.2, 2.1 and 2.2 ounces was used and the manure and fertilizer used was as noted in the first paragraph. The results were as follows:—

USES OF LARGER SEED FROM CROPS GROWN FROM SEED OF VARIOUS SIZES

Kind of seed used	Yield per Acre		
	Merchantable	Small	Total
	lb.	lb.	lb.
Commercial sized potatoes grown from potatoes of commercial size	39,397	2,177	41,574
Commercial sized potatoes grown from 3 oz. potatoes	36,047	2,721	38,768
Commercial potatoes grown from 1·5 oz. potatoes	39,038	2,572	41,610

STUDY OF TYPE.—The study of the different types found in the Green Mountain variety of potatoes, begun in 1923, was continued this year. From a bin of Green Mountains the following types were selected: (1) typical oblong type, (2) round type, (3) pointed at seed-end, and (4) pointed at stem-end. The results were as follows:—

STUDY OF TYPES OF GREEN MOUNTAIN POTATOES

Types of potatoes used for seed	Type of progeny—Percentage by weight							
	Perfect type	Fair type	Round	Pointed seed-end	Pointed stem-end	Wasp-waisted	Otherwise off type	Small
Progeny of:	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.
Perfect type	5·38	33·24	43·26	5·19	6·12	0·74	0·95	5·08
Round type	9·57	33·73	34·38	6·74	6·96	2·33	1·25	5·00
Pointed seed-end	5·63	43·36	30·59	6·75	4·50	2·06	2·01	5·06
Pointed stem-end	5·06	43·13	33·00	7·12	4·50	1·87	1·87	3·42

STUDY OF TYPES OF GREEN MOUNTAIN POTATOES

Types of potatoes used for seed	Type of progeny—Percentage by count							
	Perfect type	Fair type	Round	Pointed seed-end	Pointed stem-end	Wasp-waisted	Otherwise off type	Small
Progeny of:	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.
Perfect type	3·72	25·24	42·75	3·58	4·82	0·41	0·68	18·75
Round type	5·42	23·89	38·47	4·40	5·59	1·18	1·18	19·83
Pointed seed-end	3·30	29·61	34·29	4·54	3·98	0·82	1·23	22·31
Pointed stem-end	3·08	31·65	38·09	4·76	3·36	1·12	1·12	16·80

The yield from the different types was as shown in the following table:—

YIELD FROM VARIOUS TYPES

Type of potatoes used for seed	Yield per Acre		
	Merchantable	Small	Total
	lb.	lb.	lb.
Perfect Green Mountain type	39,754·7	2,129·1	41,883·8
Round type	37,594·2	1,987·7	39,581·9
Pointed seed-end	39,337·0	2,100·0	41,437·0
Pointed stem-end	40,057·3	1,418·7	41,476·0

STUDY OF TYPE IN SECOND GENERATION.—In 1923 different types found in the Green Mountain variety were selected and propagated. The progeny of these was classified into different groups and where sufficient seed was available these propagated in 1924. The results from the selection of three different types grown from three different types and from the selection of good round, pointed, rough and other off-types were as shown in the accompanying tables.

STUDY OF TYPE IN GREEN MOUNTAINS—2ND GENERATION—BY WEIGHT

—	Perfect type	Good type	Round	Pointed seed-end	Pointed stem-end	Wasp-waisted	Other-wise off	Small
Progeny of:	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.
Good type from good type	6·68	50·34	28·71	5·50	3·14	.....	1·47	4·12
Round type from round type	5·52	44·60	39·08	2·54	1·69	0·63	0·21	5·68
Pointed seed-end from pointed seed-end	3·95	46·85	33·98	4·85	4·74	0·36	0·68	4·54
(By Count)								
Progeny of:								
Good type from good type	4·69	38·1	32·3	3·59	2·2	.....	0·82	18·2
Round type from round type	2·68	29·8	38·38	2·2	1·22	0·24	0·24	25·18
Pointed seed-end from pointed seed-end	1·6	34·75	34·49	3·74	4·27	0·26	0·53	20·32

STUDY OF TYPE IN GREEN MOUNTAINS—2ND GENERATION—BY WEIGHT

—	Perfect type	Good type	Round	Pointed seed-end	Pointed stem-end	Wasp-waisted	Other-wise off	Small
Progeny of:	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.
Good type from round type	2·73	45·28	39·43	4·01	2·06	.....	1·03	5·41
Good type from pointed seed-end	7·83	45·79	35·71	4·12	1·42	.....	0·35	4·74
Good type from pointed stem-end	4·46	42·90	38·19	3·69	2·80	1·08	1·01	5·85
Good type from wasp-waisted	4·10	47·45	34·58	5·71	2·60	0·38	0·34	4·82
Round type from good type	1·41	43·53	42·59	1·60	2·69	0·64	0·58	6·90
Round type from round type	5·52	44·60	39·08	2·54	1·69	0·63	0·21	5·68
Round type from pointed seed-end	1·30	46·36	40·21	0·94	2·95	.....	1·83	6·38
Round type from pointed stem-end	2·01	54·60	31·74	1·95	3·49	.....	0·84	5·34
Round type from wasp-waisted	1·13	44·19	34·27	4·85	6·04	0·77	1·60	7·12
Pointed at seed-end from good type	1·36	49·63	36·59	3·68	4·04	.....	1·05	3·62
Pointed at ssed-end from round type	1·37	35·52	41·66	4·66	7·83	2·63	2·41	3·89
Pointed at seed-end from pointed at stem-end	4·93	46·66	36·79	3·70	3·19	.....	1·57	3·14
Pointed at seed-end from wasp-waisted	1·14	48·97	30·22	6·31	4·87	2·34	1·91	4·20
Pointed at stem-end from good type	0·91	40·04	33·67	3·52	9·10	5·57	2·27	4·89
Pointed at stem-end from round type	1·87	45·32	34·09	8·36	3·79	.....	2·28	4·26
Pointed stem-end from wasp-waisted	4·33	44·31	33·03	10·47	4·63	.....	.....	3·22
Rough from pointed stem-end	2·78	52·98	32·66	5·27	1·74	.....	0·54	3·98
Off type from wasp-waisted	2·78	48·80	29·75	5·34	6·62	0·87	1·16	4·64
Off type from round	1·35	50·35	33·43	4·02	2·31	0·30	3·17	5·03
(By Count)								
Progeny of:								
Good type from round type	1·31	29·39	42·25	2·09	1·31	.....	0·78	22·83
Good type from pointed at seed-end	4·37	30·87	39·61	2·18	1·91	.....	0·27	20·76
Good type from pointed at stem-end	1·79	27·62	39·64	2·81	2·55	0·51	1·02	24·04
Good type from wasp-waisted	1·99	30·92	39·4	3·74	1·99	0·24	0·24	21·44
Round type from good type	0·74	28·88	42·22	1·23	1·48	0·24	0·24	24·93
Round type from round type	2·68	29·82	38·38	2·2	1·22	0·24	0·24	25·18
Round type from pointed at seed-end	0·76	29·84	41·07	0·76	2·04	.....	1·27	24·23
Round type from pointed at stem-end	1·03	35·06	35·58	1·81	2·59	.....	0·51	23·37
Round type from wasp-waisted	0·46	29·39	36·57	2·31	4·39	0·46	0·92	25·46
Pointed at seed-end from good type	1·03	35·05	39·43	2·06	3·35	.....	0·51	18·55
Pointed at seed-end from round type	1·17	27·72	44·54	3·53	5·3	1·17	1·17	15·63
Pointed at seed-end from pointed at stem-end	2·76	35·35	40·05	3·03	2·48	.....	1·1	15·19
Pointed at seed-end from wasp-waisted	0·77	34·7	35·73	3·85	4·11	1·02	0·77	19·02
Pointed at stem-end from good type	0·53	30·31	34·57	2·92	7·44	2·12	1·59	21·27
Pointed at stem-end from round type	1·32	33·06	35·71	5·55	3·43	.....	1·32	19·57
Pointed at stem-end from wasp-waisted	3·03	34·34	38·38	5·55	3·53	.....	.....	15·14
Rough from pointed at stem-end	1·5	39·84	35·83	3·25	1·5	.....	0·5	17·54
Off type from wasp-waisted	1·69	33·71	30·87	6·79	5·09	0·56	1·13	20·11
Off type from round	0·75	34·33	34·58	2·75	2·0	.....	1·5	24·06

FEW VERSUS MANY CULTIVATIONS.—In order to determine the number of cultivations which will give the best results for the potato crop, plots were cultivated once, twice, three and four times during the season. The results were as follows:—

POTATOES—FEW VERSUS MANY CULTIVATIONS

Number of cultivations	Yield per acre		
	Merchantable	Small	Total
	lb.	lb.	lb.
1	22,084·8	2,003·7	24,088·5
2	24,437·1	1,655·2	26,092·3
3	24,783·4	1,498·4	26,281·8
4	24,589·5	1,851·2	26,440·7

This is the third year this experiment has been conducted. During the season of 1922, which was a fairly moist one, one cultivation gave the best results. In 1923, which was a dry year, three and four cultivations gave the largest yields of potatoes.

METHODS OF STORAGE.—In order to determine the effect of storage temperature on potatoes for seed purposes, three lots of Green Mountain potatoes were stored under different conditions from January 2 to planting time. Lot 1 was stored in a cold storage plant where the temperature was held from 33 to 35 degrees F. Lot 2 was stored in the Station potato cellar, and lot 3 in a house cellar with a furnace in it. The temperature of the two farm cellars was as follows:—

STORAGE TEMPERATURES

Month	Potato Cellar			House Cellar		
	Max.	Min.	Ave.	Max.	Min.	Ave.
	°	°	°	°	°	°
January	38	33	36·0	48	38	42·2
February	40	33	35·7	44	36	39·9
March	38	35	36·0	46	40	44·2
April	43	37	40·2	49	45	46·7
May	50	41	45·4	50	47	49·6
Average for period	.....	.....	38·7	.....	.....	44·4

POTATOES—STORAGE EXPERIMENT—YIELDS

Where stored	Per cent stand	Yield per acre		
		Merchantable	Small	Total
Cold storage	95·0	38,913·6	871·2	39,784·8
Potato cellar	99·1	37,328·5	1,210·0	38,538·5
House cellar	96·6	36,905·0	968·0	37,873·0

SPRAYING AND DUSTING EXPERIMENT.—A spraying and dusting experiment was carried on in co-operation with the Entomological Branch. One acre of Green Mountain potatoes was divided, and one-half sprayed with liquid Bordeaux and one-half dusted with Bordeaux dust. A check plot of two adjacent rows was kept for comparison. Few beetles made their appearance, and no Late Blight developed during the season. Early Blight developed rapidly on

the check plot late in the season and less rapidly on the sprayed and dusted plots. The first application of spray and dust was applied July 22. Subsequent applications were made at intervals of from ten days to two weeks until five applications were made.

The dust used was as follows: Two applications 12-8-8 copper arsenate dust; 50 pounds per acre.

Three applications 12-88 copper dust; 50 pounds per acre.

The spray used was as follows: Two applications 4-4-40 Bordeaux plus 1½ pounds of arsenate of lime; 85 gallons per acre.

Three applications 4-4-40 Bordeaux; 85 gallons per acre.

YIELD OF POTATOES PER ACRE

Treatment	Yield per acre		
	Merchantable	Small	Total
	lb.	lb.	lb.
Dusted	20,500	1,800	22,300
Sprayed	21,150	1,050	22,200
Check	18,600	1,300	19,900

COST OF SPRAYING AND DUSTING.—In order to obtain information on the relative cost of dusting and spraying on a commercial scale, five acres of field potatoes were given one application of spray, and six and two-thirds acres were given an application of dust. These areas were located in four different fields. The results per acre were as follows:—

COST OF SPRAYING

Amount of 4-4-40 Bordeaux	88 gal.	
Time to apply, 2 men and team	1·4 hours	
Preparing stock solution, 1 man	0·3 "	
Cost of Materials—		
8·8 lbs. hydrated lime at 1c		$ 0·088
8·8 lbs. hydrated lime at 8c		0·704
3·3 lbs. arsenate of lime at 25c		0·825
Cost of Labour—		
3·1 man hours at 25c		0·775
1·4 team hours at 20c		0·28
Total cost per acre		2·672

COST OF DUSTING

Amount of 12-8-80 copper arsenate dust	41·5 lbs.	
Time for applying, 2 men and team	·75 hours	
Cost of Materials—		
41·5 lbs. of 12-8-20 copper arsenate dust at 5·5 c		2·28
Cost of Labour—		
1·5 man hours at 25c. per hr		0·375
0·75 team hours at 20c. per hr		0·15
Total cost per acre		2·805

The results show that the materials for dusting cost more than the spraying materials and the labour less. The total cost on the areas used was practically the same. Water on this farm is readily available under pressure, which greatly facilitates the spraying operation. The sprayer used was an O.K. Mammoth with 120-gallon tank, traction driven, with triple pump. The duster used was a Niagara, traction driven, with a cotton apron extending behind the machine to hold down the dust.

METHODS OF APPLYING FERTILIZER.—Frequent complaints have been heard in this province and in the State of Maine during the past few years about fertilizer injury to the potato crop. In order to get some information on this problem an experiment was begun in 1923. Three plots were used for the experiment. One ton per acre of a 4.5-8-6 home-mixed fertilizer was used for this

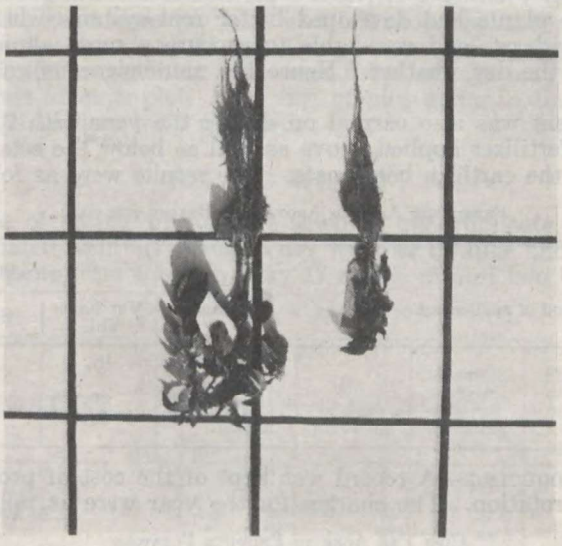
work. On one plot the fertilizer was applied broadcast. On the second plot it was applied in the row in direct contact with the seed, and on the third plot it was applied in the row and mixed with earth.

During the early part of the season the growth on the plot where the fertilizer was applied broadcast was more vigorous than on either of the other plots. It was much more vigorous than the plot where the fertilizer was in direct contact with the seed. Later in the season the difference was not so apparent.

METHOD OF APPLYING FERTILIZER

Method of application	Rate of application	Per cent stand	Yield per acre		
			Merchantable	Small	Total
	lb.		lb.	lb.	lb.
Broadcast	2,000	81·4	17,123·8	1,962·5	19,086·3
In the row in direct contact with seed	2,000	57·6	13,699·0	885·0	14,584·0
In the row and mixed with earth	2,000	71·9	17,893·4	1,154·4	19,047·8

In 1924 more extensive experiments were carried on. A 4-8-6 fertilizer was applied (1) broadcast, (2) in the row in direct contact with the seed, (3) in the row and mixed with earth. It was applied at three different rates, 1,000, 1,500 and 2,000 pounds per acre, for each of the above methods. This crop was grown on a piece of ground that had been manured the previous autumn and which was in a good state of fertility. This was the only piece of ground available for this work, and it was necessary to apply more fertilizer than was economical as is shown by the fact that 2,000 pounds of fertilizer per acre produced only a few barrels more potatoes than 1,000 pounds.



Showing effect of fertilizer on development of the root-system in potatoes, when fertilizer is applied in the row in direct contact with the seed and when applied broadcast. 4-8-6 fertilizer used at the rate of one ton per acre. Large plant, broadcast; small plant, direct contact.

METHODS AND RATES OF APPLYING FERTILIZER

Method of application	Rate of application	Per cent stand	Yield per acre		
			Merchantable	Small	Total
	lb.		lb.	lb.	lb.
Broadcast	1,000	73·8	24,263	1,123	25,386
In the row in direct contact with seed	1,000	71·6	26,054	1,449	27,503
In the row and mixed with earth	1,000	72·6	24,304	1,489	25,794
Broadcast	1,500	72·1	26,027	732	26,760
In the row in direct contact with seed	1,500	72·6	22,675	879	23,554
In the row and mixed with earth	1,500	72·5	25,728	1,123	26,851
Broadcast	2,000	84·25	25,213	1,411	26,624
In the row in direct contact with seed	2,000	72·0	25,430	977	26,407
In the row and mixed with earth	2,000	79·3	28,470	868	29,338

During the early part of the season the potatoes looked best on the plots where the fertilizer was applied broadcast. Those on the plots where the fertilizer was applied in the row in direct contact with the seed, presented the poorest appearance. The difference in appearance was less with the smaller amounts of fertilizer, and was barely noticeable where only 1,000 pounds per acre of fertilizer was applied. Where 2,000 and 1,500 pounds per acre of fertilizer were applied broadcast, the potatoes bloomed a few days earlier than where the same amount of fertilizer was applied in the row. The apparent difference in growth began to disappear after the middle of July. Up until that time the weather was dry, but the latter part of that month was showery and growth in all the plots was rapid. An examination was made of several plants in the different plots during the early season. Where the fertilizer was applied broadcast the plants apparently had longer and more bulky root systems than where the fertilizer was applied in the row. Where the fertilizer was applied in the row and mixed with earth the plants had longer and more bulky root systems than where the fertilizer was in direct contact with the seed. It seemed as if the plants had developed better root-systems where the fertilizer was applied broadcast, and were able to procure a more abundant supply of moisture during the dry weather. Hence the more vigorous growth during the early season.

An experiment was also carried on during the year with 2,000 pounds per acre of a 4-8-6 fertilizer applied above as well as below the sets. The fertilizer was mixed with the earth in both cases. The results were as follows:—

FERTILIZER APPLIED ABOVE AND BELOW THE SETS

Method of application	Per cent stand	Yield per acre		
		Merchantable	Small	Total
		lb.	lb.	lb.
Below sets	74·0	20,815	598	21,413
Above sets	72·7	22,012	811	22,823

COST OF PRODUCING.—A record was kept of the cost of producing potatoes in a three-year rotation. The charges for the year were as follows:—

COST PER ACRE TO PRODUCE POTATOES

Rent and taxes		$ 3 00
Manure (50 per cent of 12 tons at $2 per ton)		12 00
Fertilizer (100 lbs. nitrate of soda at $3.09)	$ 3 09	
252·6 lbs. acid phosphate at $1.09	2 75	
100 lbs. muriate of potash at $1.84	1 84	
		7 68

COST PER ACRE TO PRODUCE POTATOES—*Concluded*

Seed, 7·5 bbl. at $3 per bbl.		22 50
Machinery		3 00
Ploughing (man and 2 horses 12 hrs. at 45c.)	5 40	
Harrowing (man and 2 horses 4·5 hrs. at 45c.)	2 02	
Cutting and disinfecting (man 9 hrs. at 25c.)	2 25	
Planting (2 men and 2 horses 3·75 hrs. at 70c.)	2 63	
Cultivating (1 man and 1 horse 4·5 hrs. at 35c.)	1 57	
Horse-hoeing (1 man and 2 horses 4·5 hrs. at 45c.)	2 02	
Spraying (5 times) (1 man 15·5 hrs. at 25c. and 2 horses 7·0 hrs. at 20c.)	5 27	
Digging (man and 2 horses 4 hrs. at 45c.)	1 80	
Picking (22·5 man hrs. at 25c.)	5 62	
Hauling (man and 2 horses 4 hrs. at 45c.)	1 80	
Loading and unloading (5 man hrs. at 25c.)	1 25	
		31 63
Spray material		8 08
Total cost per acre		$ 87 89
Value per acre 126 bbl. potatoes at 70c		88 20
Profit per acre		0 31

The results show that with a crop above average and the lowest cost of production for eight years, the potato crop yielded practically no profit this year.

CEREAL HUSBANDRY

The experimental work this season included variety tests of spring wheat, oats, barley, beans, peas and buckwheat; tests of rates of seeding and dates of sowing Banner oats; tests of rates of seeding Marquis wheat; tests of various mixtures of barley and oats, and of barley, wheat and oats; and variety tests in rod-row plots of wheat, oats and barley. All the grain was treated with formalin solution (one pint to thirty gallons of water).

With the exception of the rod-row plots, all the wheat, oats and barley plots were grown on land which grew a hoed crop the previous year. For the hoed crop the land received an application of barnyard manure at the rate of 15 tons per acre and of home-mixed 4.5-8-6 fertilizer at the rate of 1,128 pounds per acre. For the grain crop the land was fall ploughed and put in good tilth with a spring-tooth cultivator and smoothing harrow this spring. Except where otherwise stated, the two outside rows were taken off the sides and a foot was cut from the ends of each plot. The size of plot given in the text represents the size when the borders were removed.

SPRING WHEAT

Six varieties of spring wheat were sown in quadruplicate $\frac{1}{100}$-acre plots. The seed germinated well but owing to dry weather in June and July, the straw was light. The plots were sown on May 17 at the rate of two bushels per acre.

SPRING WHEAT—VARIETY TEST

Name of variety	Date of ripening	No. of days maturing	Average length of straw including head	Strength of straw on scale of 10 points	Yield of grain per acre	
			inches		bu.	lb.
*Early Russian Ottawa 40	Aug. 18	93	27·5	9	29	54
White Russian	" 22	97	32·5	9·37	27	12
Early Red Fife, Ottawa 16	" 22	97	30·0	9·37	25	22
*Huron, Ottawa 3	" 19	94	29·7	10·0	24	20
Marquis, Ottawa 15	" 19	94	24·5	9·37	19	38
Ruby, Ottawa 623	" 14	89	24·7	8·25	18	2

*The average of only three plots of Early Russian and of Huron was taken.

The average yields for the varieties which have been grown the last five years are White Russian—23 bushels, 8 pounds; Huron—21 bushels, 56 pounds; Early Red Fife—21 bushels, 2 pounds; Marquis—19 bushels, 38 pounds; Ruby—19 bushels, 15 pounds. Early Russian was not grown in 1920. It has given the largest average yield for the last four years and appears well adapted for this district. Marquis and Ruby are not so well adapted for this district as the other varieties. (Project Ce 1.)

OATS

Five varieties of oats were tested this year. Owing to dry weather, the straw was short and the yields of grain were smaller than the previous year. The oats were sown on May 17 in quadruplicate $\frac{1}{100}$-acre plots.

OATS—VARIETY TEST

Name of variety	Date of ripening	No. of days maturing	Average length of straw including head	Strength of straw on scale of 10 points	Yield of grain per acre	
			inches		bu.	lb.
Gold Rain	Aug. 18	93	31·7	10·0	56	14
Victory	" 18	93	31·7	9·87	52	31
Banner Ottawa 49	" 18	93	31·0	9·75	50	18
Alaska	" 12	87	27·0	8·0	36	14
*Laurel	" 16	91	25·7	9·5	30	23

*Laurel is a hulless variety of oats but is figured at 34 pounds per bushel.

The average yield for the varieties of oats grown the last five years are Victory—58 bushels, 24 pounds; Banner—54 bushels, 6 pounds. Victory has outyielded every other variety during eight of the ten years it has been grown at this Station. Gold Rain has been grown only four years but during that period it has had a higher average yield than Banner. Victory and Gold Rain are good plump oats with strong straw and appear well adapted to this district Alaska is an early oat and has a better appearance than Daubeney but it has been very susceptible to leaf rust this year. Laurel (hulless) has more resistance to smut than Liberty, the hulless variety grown in previous years. (Project Ce 5.)

BARLEY

Five varieties of barley were tested this year. Owing to the dry weather all varieties of barley ripened at practically the same time. Charlottetown No. 80 barley did not drop its awns this year. The plots were sown on May 17 in $\frac{1}{100}$-acre plots at the rate of two and one-half bushels per acre.

BARLEY—VARIETY TEST

Name of variety	Date of ripening	No. of days maturing	Average length of straw including head	Strength of straw on scale of 10 points	Yield of grain per acre	
			inches		bu.	lb.
Charlottetown No. 80	Aug. 18	93	26·0	10·0	33	14
O.A.C. 21	" 18	93	27·2	9·62	29	37
Chinese Ottawa 60	" 16	91	27·5	9·62	26	10
Duckbill Ottawa 57	" 17	92	23·2	8·87	23	29
Himalayan Ottawa 59	" 11	86	23·0	7·87	20	25

For the varieties grown the last five years, the average yields are: O.A.C. 21, 31 bushels 31 pounds; Duckbill, 28 bushels 24 pounds. Charlottetown No. 80 has been grown only four years but during three of these years, it has outyielded every other variety. It is apparently well adapted to this district. Himalayan is a hulless variety but owing to the weakness of the straw, it would be difficult to harvest under field conditions. (Project Ce 6.)

GRAIN MIXTURES

Tests of grain mixtures were begun in 1923 to determine (1) whether a combination of grain would outyield the same grains sown separately, (2) which were the best varieties to combine and (3) what proportion of each grain should be in the mixture.

BARLEY, WHEAT AND OATS

On May 21 triplicate $\frac{1}{110}$-acre plots were sown with Huron wheat, Banner oats and Charlottetown No. 80 barley at the rates per acre and in the combinations shown in the following table:—

GRAIN MIXTURES—BARLEY, WHEAT AND OATS

Mixture per acre	Date of ripening	Number of days maturing	Yield of grain per acre	Yield per acre of grain sown separately		
				Wheat	Barley	Oats
			lbs.	lbs.	lbs.	lbs.
Wheat 1, Oats 1, Barley 1..	Sept. 2	104	1,459	*1,460	*1,598	*1,584
Wheat 1, Oats ½, Barley 1..	" 2	104	1,377	1,460	1,598	1,584
Wheat ½, Oats 2, Barley 1..	" 2	104	1,517	1,460	1,598	1,584

*Wheat, barley and oats were sown at the rates per acre of 127, 117 and 107 pounds respectively. (Project Ce. 61.)

BARLEY AND OATS

On May 21 triplicate 1/110-acre plots were sown with Banner oats and Charlottetown No. 80 barley in the combinations and at the rates per acre shown in the following table:—

GRAIN MIXTURE—BARLEY AND OATS

Mixture per acre	Date of ripening	Number of days maturing	Yield of mixture per acre	Yield of grain sown separately per acre	
				Oats	Barley
bush.			lbs.	lbs.	lbs.
Oats 1, Barley 1	Sept. 2	104	1,365	1,584	1,598
Oats 1½, Barley 1½	" 2	104	1,693	1,584	1,598
Oats 2, Barley 1	" 2	104	1,731	1,584	1,598

(Project Ce. 60.)

PEAS

Five varieties of peas were tested this year. They were sown on land which had been in rape the previous year. The rape was used for pasturing lambs. The land was a sandy loam. On part of the field, which suffered more severely from the dry weather, the peas ripened much the earliest. The peas were sown on May 8 in quadruplicate 1/100-acre plots.

PEAS—VARIETY TEST

Name of variety	Date of ripening	Number of days maturing	Average length of plant	Average length of pod	Yield per acre
			inches	inches	bush. lbs.
MacKay Ottawa 25	Aug. 22–27	106–111	42·5	2·06	35 15
Arthur Ottawa 18	" 12–15	96–106	33·7	2·0	32 32
*Chancellor Ottawa 26	" 5–22	89–106	34·3	1·66	30 17
Canadian Beauty	" 22–27	106–111	44·5	2·18	30 8
*Prussian Blue	" 12–22	96–111	40·0	2·25	27 6

*Only 3 plots of Chancellor and of Prussian Blue were grown.

The average yield for the varieties grown the past five years has been Arthur, 23 bushel 20 pounds; Canadian Beauty, 21 bushel 15 pounds; Prussian Blue, 19 bushel 49 pounds; MacKay has only been grown the past four years. Each year, except 1923, when the yield of this variety was decreased by rogueing the plots, it has outyielded every other variety. Chancellor was grown for the first time this year. It is a small, early pea and is apparently a good yielder in this district. (Project Ce 7.)

BEANS

Five varieties of beans were tested in quintuplicate plots this year. The land on which the beans were grown was a two-year-old clover sod. It was ploughed in the fall. This spring it was manured with barnyard manure at the rate of 15 tons per acre. It was drilled with the potato planter, and 700 pounds of home-mixed 4-8-6 fertilizer were applied by the planter when the drills were being made. The beans were sown on the 26th of May.

BEANS—TEST OF VARIETIES

Name of variety	Date of ripening	Number of days maturing	Average length of straw	Average length of pod	Yield per acre
			inches	inches	bush. lbs.
Navy Ottawa 711	Sept. 12	109	18·6	4·1	42 28
White Marrowfat	" 12–25	109	17·8	4·1	38 9
White Pea	" 12–20	109	19·6	4·2	36 37
Soldier	" 12	109	16·0	5·7	33 26
Norwegian, Ottawa 710	" 12	109	16·0	5·2	32 21
Large White Ottawa 713	" 15	112	16·3	4·1	27 35
Yellow Eye, Kentville	" 12–15	109	17·8	4·4	26 15
Beauty Ottawa 712	Aug. 29–Sept. 12	95–109	14·3	4·0	21 47
Carleton, Ottawa 718	Aug. 29	95	13·4	4·2	16 5

Navy, White Marrowfat, White Pea and Soldier were less infected with anthracnose than the other varieties. White Marrowfat and Soldier are the best quality. Carleton has been so badly infected with anthracnose the past three seasons that the crop was worthless. (Project Ce 8.)

BUCKWHEAT

Eleven varieties or strains of buckwheat were tested this year. They were sown on June 19 at the rate of 3 pecks per acre. Owing to danger of frost, it was necessary to cut all plots that were not mature on September 27. The results are shown in the following table:—

BUCKWHEAT

Name of variety	Number plots	Date cut	Yield per acre		Remarks
			bush.	lbs.	
Rye A	1	Sept. 12	53	34	60 per cent ripe; lodged badly.
Tartarian	1	" 12	48	40	
Russian H	2	" 27	41	13	Fairly ripe.
Silver Hull	2	" 27	40	40	Considerable green.
Japanese M	1	" 27	40	18	Considerable green.
Grey D	1	" 27	39	35	Majority ripe.
Grey F	1	" 27	38	36	Majority ripe.
Rye H	2	" 19	37	5	60-75 per cent ripe.
Japanese J	1	" 27	36	41	Majority ripe.
Petrograd	3	" 27	36	6	Considerable green.

NOTE.—The buckwheat was so badly tangled that it was found impossible to remove the borders from the plots.

ROD-ROW VARIETY TESTS OF CEREALS

This spring a series of variety tests of cereals was begun in rod-row plots. Each plot consisted of three drills a rod long, spaced 7 inches apart. The yield of only the centre row was taken, the other two rows being disregarded. Each variety was tested four times in this manner. Fifteen varieties of wheat, twenty-nine varieties of oats and nineteen varieties of barley were tested. The results will be published at a later date when more data are available.

FORAGE CROPS

The soil and subsoil were well saturated with moisture in the fall. Heavy snows in April made the spring rather late. June and July were very dry but August and September were good growing months. The harvest season was favourable and the crops were harvested in good condition. The hay crop was rather light but corn, sunflowers and roots gave good yields.

FIELD ROOTS

Variety tests of swedes, turnips, mangels, sugar beets, carrots and kale were all conducted in quadruplicate. The land on which they were grown was a clay loam. One plot of each variety was grown on oat stubble and the other three were grown on one-year-old clover sod. The land was fall-ploughed. In the spring it was given a broadcast application of fifteen tons per acre of barnyard manure. The manure was thoroughly disked into the soil. Thirty-inch drills were then made with a potato planter. Six hundred pounds per acre of 4-8-6 home-mixed fertilizer were applied by the potato planter when drilling the land. A composite sample was taken from the four plots of each variety and sent to Ottawa for dry-matter determination.

TURNIPS AND SWEDES—VARIETY TEST

Three varieties of turnips and twenty-six varieties of Swedes were sown on May 20. They were thinned to eleven inches on June 17 and were harvested on October 21. The results are shown in the accompanying table. (Project Ag. 46.)

Variety	Source of seed	Yield per acre green weight		Yield per acre dry weight		Remarks
		tons	lbs.	tons	lbs.	
*Yellow Tankard B. T. 351.	Danske Landboforeningers Froforsyning, Roskilde.	36	1.822	3	1,677	Yellow-top tankard, easy to pull, free from roots, thirty-two per cent mostly intermediates, off type.
Bangholm No. 1116A.	Trifolium	24	339	3	1.632	Purple-top oval; hard to pull; free from roots; thirty per cent globes and flats.
Olsgard Bangholm Swede.	Hjalmar, Hartman & Co., Copenhagen.	25	1,657	3	1,552	Purple-top oval; hard to pull rooty; thirteen per cent globes and flat.
Shepherd Golden Globe.	Hjalmar, Hartman & Co., Copenhagen.	25	1,878	3	1,449	Golden-coloured globe, easy to pull; free from roots; nineteen per cent ovals.
Shepherd	Trifolium	27	1,576	3	1,163	Bronze-top oval; easy to pull; free from roots; eighteen per cent flat or globes.
Ditmars	H. H. McNutt	27	1,743	3	1,101	Bronze-top oval; easy to pull; free from roots; twenty-two per cent globes and flats.
Garton's Superlative.	Wm. Ewing Co.	25	1,196	3	517	Purple-top oval; good clean roots; uniform; easy to pull; free from roots; thirteen per cent globes.
Irish King Bronze Top.	Wm. Rennie Seed Co.	21	267	3	382	Bronze-top oval; easy to pull; free from roots; eight per cent globes.
Mammoth Clyde Purple Top.	Wm. Ewing Co.	21	924	3	258	Purple-top globe; very hard to pull; very rooty; has thick neck; ten per cent ovals.
Best of All	Wm. Ewing Co.	22	925	3	177	Purple-top oval; hard to pull; somewhat rooty; ten per cent globes.
Bangholm	Wm. Ewing Co.	23	1,635	3	116	Purple-top oval; hard to pull; rooty; eight per cent globes.
Kangaroo	Wm. Ewing Co.	20	1,788	3	63	Bronze-top oval; hard to pull; rooty; nine per cent globes.
Best of All	Wm. Rennie Seed Co.	26	1,173	2	1,997	Purple-top oval; hard to pull; clean and top thick; objectionable neck; four per cent globes.
Magnum Bonum	Wm. Rennie Seed Co.	22	1,408	2	1,957	Purple-top oval; hard to pull; free from roots; twelve per cent globes.
Bangholm Swede.	General Swedish Seed Co., Svalof.	21	687	2	1,493	Purple-top oval; easy to pull; free from roots; sixteen per cent globes.
Kangaroo Bronze Green Top.	Wm. Rennie Seed Co.	17	1391	2	1,099	Bronze-top oval; hard to pull;; rooty; eight per cent globes.
*Fynsk Bortfelder Parti 2660.	Danske Landboforeningers Froforsyning, Roskilde.	27	271	2	987	Long white swede; hard to pull; free from roots; fourteen per cent off type.
Universal	Wm. Ewing Co.	18	1,759	2	957	Purple-top globe; hard to pull; rooty; ten per cent ovals.
Bangholm Purple Top.	Wm. Ewing Co.	19	175	2	936	Purple-top globe; hard to pull; very rooty; seventeen per cent ovals.
Bangholm	Nappan	15	1,792	2	873	Purple-top oval; small; hard to clean; very rooty; a few intermediates.
New Century Purple Top.	Wm. Rennie Seed Co.	16	1,971	2	759	Purple-top oval; hard to pull; free from roots; twenty per cent globes.
Invicta Bronze Top	Wm. Rennie Seed Co.	17	966	2	615	Purple-top globe; hard to pull; somewhat rooty; one per cent ovals.
*Dales BI 773	Danske Landborofeningers Froforsyning, Roskilde.	20	1,363	2	566	Flat green-top; easy to pull and free from roots; thirteen per cent globes and ovals.
Canadian Gem Purple.	Wm. Rennie Seed Co.	19	1,407	2	551	Purple-top oval; hard to pull; free from roots; seventeen per cent globes.
Improved Yellow Swedish.	General Swedish Seed Co., Svalof.	18	675	2	463	Yellow flat swede; easy to pull; free from roots; ten per cent globes and ovals.

TURNIPS AND SWEDES—TEST OF VARIETIES—*Concluded*

Variety	Source of seed	Yield per acre green weight	Yield per acre dry weight	Remarks
		tons lbs.	tons lbs.	
*Funen Bortfelder Swede.	Hjalman Hartman & Co., Copenhagen.	25 940	2 401	Long greenish-white turnips; hard to pull; free from roots; sixteen per cent intermediate.
Halewood's Green Top.	Wm. Ewing Co.....	17 1,499	2 316	Green to bronze-top oval; hard to pull; rooty; seven per cent purple top ovals; five per cent globes.
Hartley's Bronze Top.	Wm. Rennie Seed Co...	15 1,657	2 137	Bronze-top globe; hard to pull; free from roots; fifteen per cent ovals.
Magnum Bonum...	Wm. Ewing Co.....	23 857	1 464	Purple-top oval; hard to pull; free from roots; eleven per cent globes.

*These are turnips. The remainder are swedes.

Ditmar (H. H. McNutt), and Garton's Superlative (Wm. Ewing Co.), were of especially good quality and very uniform.

MANGELS—VARIETY TEST

Thirty-two varieties of mangels were sown on May 15. They were thinned to a foot apart on June 24, and were harvested on October 13. The yields are shown in the accompanying table.

MANGELS—TEST OF VARIETIES

Name of variety	Source of seed	Yield per acre green weight	Yield per acre dry weight	Remarks
		tons lbs.	tons lbs.	
Barres Half Long.	General Swedish Seed Co., Svalof.	17 939	3 89	Orange-yellow half-long; very easy to pull; twenty per cent off type.
Taaroje Barres....	Hjalmar Hartman & Co., Copenhagen.	20 81	2 1,430	Orange-coloured oval; easy to pull; thirty-one per cent intermediates.
Barres Sludstrup..	General Swedish Seed Co., Svalof.	19 603	2 1,385	Orange-coloured intermediates; very easy to pull; seventeen per cent ovals and tankards.
Ideal.....	Wm. Rennie Seed Co...	19 410	2 1,312	Yellow tankard, very easy to pull; eighteen per cent off type.
Danish Sludstrup.	Kenneth McDonald & Son.	17 404	2 1,301	Yellow intermediate; very easy to pull; twenty-two per cent off type.
Yellow Eckendorfer.	General Swedish Seed Co., Svalof.	18 277	2 1,278	Orange-coloured tankard; very easy to pull; twelve per cent globes and ovals.
Rosted Barres....	Hjalman Hartman & Co., Copenhagen.	16 1,733	2 1,215	Long, rose to golden-coloured tankard; very easy to pull; twenty per cent off type.
Red Top White Sugar.	Wm. Ewing Co.....	8 592	2 1,189	White intermediate; very rooty; very hard to pull; six per cent off type.
Elvetham Mammoth.	Hjalmar Hartman & Co., Copenhagen.	13 617	2 1,131	Long red; very hard to pull; fourteen per cent off type.
Barres Oval.....	General Swedish Seed Co., Svalof.	17 922	2 1,046	Lemon-coloured oval; very easy to pull; thirty-four per cent intermediates and tankards.
Giant White Half Sugar.	Wm. Ewing Co.....	14 226	2 1,041	White green-top, intermediate; hard to pull; twenty-five per cent off type.
Golden Tankard..	Wm. Rennie Seed Co...	13 1,014	2 924	Golden to red-coloured tankard; very easy to pull; thirty-four per cent off type.
Sludstrup Barres..	Hjalmar Hartman & Co., Copenhagen.	15 896	2 915	Orange-coloured intermediate; easy to pull; sixteen per cent off type.

MANGELS—TEST OF VARIETIES—*Concluded*

Name of variety	Source of seed	Yield per acre Green weight		Yield per acre dry weight		Remarks
		tons	lbs.	tons	lbs.	
Perfection Mammoth Long Red.	Wm. Rennie Seed Co...	13	1,362	2	908	Rose to orange colour; lacks uniformity; type ranges from intermediate to long; very hard to pull.
White Green Top Half Sugar.	Hjalmar Hartman & Co., Copenhagen.	14	9	2	867	Greenish-white half-long; lacks uniformity; easy to pull; thirty-two per cent off type.
Improved Giant Sugar.	Wm. Rennie Seed Co...	14	1,347	2	833	Long rose; easy to pull; thirty-three per cent off type.
Svalof Red.....	General Swedish Seed Co., Svalof.	12	1,321	2	732	Long Red; hard to pull; eighteen per cent off type.
Giant Yellow Intermediate.	Wm. Ewing Co.....	14	477	2	698	Yellow intermediate; easy to pull; twenty-seven per cent off type.
Eckendorfer Yellow.	Hjalmar Hartman & Co., Copenhagen.	19	802	2	648	Yellow coloured tankard; very easy to pull; nine per cent ovals.
Svalof Original Alfa.	General Swedish Seed Co., Svalof.	15	445	2	603	Long white; easy to pull; seventeen per cent off type.
Golden Tankard...	Wm. Ewing Co.....	14	1,874	2	573	Golden to red-coloured tankard; easy to pull; twenty-six per cent ovals and intermediates.
Stryno Barres.....	Hjalmar Hartman & Co., Copenhagen.	15	1,883	2	479	Orange-coloured intermediates; lacks uniformity; very easy to pull.
Long Red Mammoth.	Wm. Ewing Co.....	14	995	2	384	Long red; very rooty; hard to pull; nine per cent intermediates.
Danish Sludstrup.	Wm. Ewing Co.....	11	1,661	2	372	Orange-coloured oval; hard t pull; twenty-six per cent (mostly intermediates) off type.
Giant Yellow Globe.	Wm. Ewing Co.....	16	1,548	2	364	Lemon-coloured, globe to oval; easy to pull; five per cent off type.
Red Eckendorfer..	General Swedish Seed Co., Svalof.	16	1,385	2	233	Red tankard; easy to pull; fifteen per cent off type.
Leviathan.....	Wm. Rennie Seed Co...	12	1,117	2	141	Long rose; hard to pull; twenty-eight per cent off type.
White Red Top Half Sugar.	Hjalmar Hartman & Co., Copenhagen.	12	628	2	46	Rose-coloured, intermediate; easy to pull; twenty per cent off type.
Eckendorfer Red..	Hjalmar Hartman & Co., Copenhagen.	13	1.431	2	43	Red tankard, very easy to pull; six per cent ovals.
Fjerritsley Barres.	Hjalmar Hartman & Co., Copenhagen.	12	1,734	2	24	Orange-coloured ovals; very easy to pull; twenty-six per cent off type.
Giant Yellow Globe.	Wm. Rennie Seed Co...	11	681	1	1,851	Yellow globe, smooth; easy to pull; sixteen per cent off type.
Yellow Intermediate.	C. E. F.....	11	915	1	1,460	Yellow intermediate; easy to pull; fifteen per cent off type.

CARROTS—VARIETY TEST

Fifteen varieties of carrots were sown on May 19. They were thinned to four inches June 28 and were pulled on October 4. The yields are shown in the following table:— (Project Ag. 36.)

CARROTS—TEST OF VARIETIES

Name of Variety	Source of Seed	Yield per Acre Green Weight		Yield per Acre Dry Weight	
		Ton	lb.	Ton	lb.
Danish Champion	Central Exp. Farm	14	1,994	2	1
Improved Intermediate White	William Ewing Seed Co	16	1,245	1	1,926
Champion Carrot	Hjalmar Hartman & Co., Copenhagen	13	282	1	1,913
White Belgian (French)	William Ewing Seed Co	16	212	1	1,881
White Belgian No. 1207	Trifolium	15	120	1	1,861
Yellow Belgian	William Ewing Seed Co	14	588	1	1,696
Mammoth White Intermediate	William Rennie Seed Co	15	805	1	1,653
Half Long White	General Swedish Seed Co., Svalof	12	1,861	1	1,656
Mammoth Short White	William Rennie Seed Co	16	621	1	1,643
Large White Belgian	William Rennie Seed Co	15	234	1	1,606
New Yellow Intermediate	William Ewing Seed Co	16	262	1	1,513
White Belgian Carrot	Hjalmar Hartman & Co., Copenhagen	14	1,202	1	1,498
White Belgian	Dupuy & Ferguson	13	45	1	1,367
James B. T. 781	Danske Landboforeningers Forforsyning Roskilde	10	1,883	1	1,061
Champion Carrot	General Swedish Seed Co., Svalof	9	1,928	1	387

SUGAR BEETS—VARIETY TEST

Eight varieties of sugar beets were sown on May 16. They were thinned to nine inches on June 24. They were pulled on October 10. The yields are shown in the following tables. (Project Ag 66.)

SUGAR BEETS—TEST OF VARIETIES

Name of Variety	Source of Seed	Yield per acre green weight		Yield per acre dry weight	
		Ton	lb.	Ton	lb.
Heming & Harving	Dominion Sugar Co	9	978	2	1,264
Harving	Dominion Sugar Co	9	209	2	1,162
Sluice Bros. Holland	Dominion Sugar Co	8	1,746	2	867
Shreiber & Son	Dominion Sugar Co	8	414	2	362
Dr. Burgman	Dominion Sugar Co	7	909	2	308
Kitchener	Dominion Sugar Co	6	1,692	2	66
Deippe	Dominion Sugar Co	6	1,770	1	1,921
Vilmorins Improved B	Vilmorin Andrieux & Co	6	1,142	1	1,717

KALE—VARIETY TEST

Six varieties of kale were sown on May 31 and thinned to five inches on June 21. They were harvested on October 2. The yields are shown in the following table:—

KALE—TEST OF VARIETIES

Name of Variety	Source of Seed	Yield per Acre			
		Green weight		Dry weight	
		Ton	lb.	Ton	lb.
Green stemmed Marrow	Webb & Son, England	15	26	2	26
French Marrow	Sutton, England	13	1,390	1	1,659
1,000 Headed	Sutton, England	11	71	1	1,518
Improved 1,000 Headed	Sutton, England	10	1,924	1	1,321
Sheep	Sutton, England	11	1,661	1	1,052
Purple Stemmed Marrow	Webb & Son, England	10	1,123	1	1,020

ENSILAGE CROPS

CORN—VARIETY TEST

Twenty-four varieties of corn were sown in quadruplicate plots on the 23rd of May. The area of the plots was 288 square feet. The corn was planted in hills three feet apart each way and thinned to three plants to each hill. In harvesting all hills with misses were disregarded. The corn was grown on a sandy clay loam with a southwest slope. The previous year the land was manured at the rate of fifteen tons barnyard manure per acre and grew a crop of mangels. For the corn, the land was ploughed in the fall, thoroughly harrowed in the spring and given a broadcast application of 4-8-6 home-mixed fertilizer at the rate of 1,000 pounds per acre. The corn was cut on September 22 owing to danger of frost. (Project Ag. 1.)

CORN—TEST OF VARIETIES

Name of Variety	Source of Seed	Degree of Maturity	Yield per Acre			
			Green Weight		Dry Matter	
			Ton	lb.	Ton	lb.
Comptons Early	J. O. Duke	Medium dough to early milk	26	330	4	207
Burr Leaming	Geo. S. Carter	Early milk partly developed ears.	25	835	3	1,281
Hybrid	A. Wimple	Late milk to early dough	22	102	3	701
Disco Longfellow	Dakota Improved Seed Co.	Early to late milk	24	286	3	669
Wisconsin No. 7	J. O. Duke	Early milk	21	573	3	656
North Western Dent	Wm. Rennie Seed Co	Early to late dough, a few beginning to dent.	21	1,855	3	566
Wisconsin No. 7	John Park	Early milk	21	643	3	566
Golden Glow	J. O. Duke	Early milk to early dough	20	601	3	321
Longfellow	J. O. Duke	Early milk to early dough	21	1,111	3	200
Yellow Dent	A. Wimple	Early milk to early dough	20	1,530	3	124
Disco 90 Day White Dent	Dakota Improved Seed Co.	Early milk to mediumdough	19	1,296	2	1,982
North Dakota	Steele Briggs	Early milk to medium dough. A few glazed.	19	1,703	2	1,968
Leaming	J. O. Duke	Early to medium milk	18	1,526	2	1,942
Leaming	John Park	Early to late milk	18	1,055	2	1,655
White Cap Yellow Dent	Steele Briggs	Early to late milk	18	150	2	1,596
North Western Dent—North Dakota grown.	A. E. MacKenzie	Late dough, some denting	16	797	2	1,486
North Western Dent—Nebraska grown.	A. E. MacKenzie	Medium to late dough, considerably dented.	16	1,223	2	1,467
Disco Pride Yellow Dent	Dakota Improved Seed Co.	Early milk to medium dough.	16	959	2	1,404
Northwestern Dent	O. Will	Late dough, some dented	16	1,498	2	1,200
Quebec 28	MacDonald College	Firm dough, glazed	15	1,464	2	1,092
Disco Northwestern Red Dent.	Dakota Improved Seed Co.	Medium to late dough, slight denting.	16	1,138	2	1,075
Northwestern Dent	Brandon Experimental Farm.	Late dough, considerable denting	13	1,161	2	926
Twitchell's Pride	G. M. Twitchell	Medium dough, glazed	14	472	2	610
Amber Flint	A. Wimple	Firm dough, some glazed	12	271	1	1,181

NOTE.—Dry matter obtained by sending five pound samples of green material of each plot to Ottawa for dry matter analysis.

SUNFLOWERS—VARIETY TEST

Ten varieties of sunflowers were sown on the 23rd of May. The area of the plot was 228 square feet. The sunflowers were planted in hills three feet

apart and thinned to three plants to each hill. In harvesting, all hills with misses were disregarded. The sunflowers were grown in the same field and the land was given the same preparation and fertilization as corn in its variety test. Mennonite was one hundred per cent in bloom when cut: all the other varieties were fifty per cent in bloom. (Project Ag. 76.)

SUNFLOWERS—TEST OF VARIETIES

Name of Variety	No. of Plots	Source of Seed	Date Cut	Yield per Acre	
				Green Weight	Dry Weight
				Ton lb.	Ton lb.
Russian Giant	3	Dakota Improved Seed Co.	Sept. 8	22 165	3 689
Mammoth Russian	6	Kenneth McDonald	Sept. 8	20 1,422	3 584
Black	3	C.P.R.	Aug. 15	11 319	1 1,089
Manchurian	4	C.P.R.	Aug. 14–15	12 1,095	1 939
Manchurian	4	A.E. McKenzie Seed Co.	Aug. 14	10 1,320	1 857
Mammoth Russian	3	C.P.R.	Aug. 14–15	11 545	1 789
C.E.F. 76	3	Ottawa	Aug. 15	10 1,545	1 707
Mixed	3	C.P.R.	Aug. 14–15	10 412	1 628
Manteca	4	C.P.R.	Aug. 14	9 1,749	1 495
Mennonite	3	Rosthern	Aug. 8	5 1,266	.. 1,319

NOTE.—Dry matter obtained by sending a five pound sample to Ottawa for dry matter analysis.

GRASSES, CLOVER AND ALFALFA

EXPERIMENT WITH GRASSES AND CLOVERS

In order to further test mixtures of grasses and clovers under New Brunswick conditions, a new series of twenty-four duplicate plots were sown on June 16, 1923. The plots were one-fiftieth acre when a foot was cut off the edges. All plots were sown without a nurse crop. The plan of seeding was as follows:—

Plots 1-6 inclusive—the grasses were sown in combination with red clover.

Plots 7-12 inclusive—the grasses were sown in combination with alsike clover.

Plots 13-18 inclusive—the grasses were sown in combination with red clover and alsike clover.

Plots 19-24 inclusive—the grasses were sown alone. Timothy, meadow fescue and orchard grass were the grasses used.

The land grew a crop of buckwheat in 1922. This was ploughed under on August 3 and the land was kept free from weeds by harrowing until the plots were sown therefore the land was clean and in good tilth. Excellent stands were secured and there was no winter-killing.

The dates of blooming were as follows: orchard grass, June 23; meadow fescue, July 5; timothy, July 16; red clover, July 5; alsike clover, June 28. Owing to the different dates of blooming, plots were cut on three different dates. Plots containing orchard grass in any combination were cut on June 28; plots containing meadow fescue alone or in combination with timothy, red clover or alsike clover, on July 10, and those containing timothy alone or in combination with red and alsike clover were cut on July 21. There was very little aftermath, therefore the plots were not cut a second time. The results are shown in the following table. (Project Ag. 146.)

Plot No.	Rate of seeding per acre					Yield per acre				
	Red clover	Alsike clover	Timothy	Meadow fescue	Orchard grass	Date cut	Green weight		*Hay	
	lb.	lb.	lb.	lb.	lb.		Ton	lb.	Ton	lb.
14	8	2	.....	15	.....	July 10	8	1,150	3	1,180
4	10	.....	6	10	.....	July 10	7	1,575	3	700
2	10	.....	.....	15	.....	July 10	8	625	3	596
8	.....	6	.....	15	.....	July 10	7	1,525	3	421
13	8	2	8	.....	.....	July 21	7	1,075	3	293
7	.....	6	8	.....	.....	July 21	7	275	3	135
10	.....	6	6	10	.....	July 10	7	550	2	1,948
16	8	2	6	10	.....	July 10	7	775	2	1,946
20	.....	.....	.....	30	.....	July 10	6	175	2	1,533
17	8	2	6	.....	10	June 28	7	850	2	1,506
5	10	.....	6	.....	10	June 28	8	450	2	1,297
22	.....	.....	8	15	.....	July 10	5	1,650	2	1,272
1	10	.....	8	.....	.....	July 21	6	425	2	1 271
19	.....	.....	12	.....	.....	July 21	5	475	2	969
12	.....	6	.....	10	10	June 28	7	75	2	885
23	.....	.....	8	.....	15	June 28	6	125	2	735
9	.....	6	.....	.....	15	June 28	6	475	2	365
11	.....	6	6	.....	10	June 28	6	425	2	289
15	8	2	.....	.....	15	June 28	5	1,800	2	194
6	10	.....	.....	10	10	June 28	6	525	2	190
3	10	.....	.....	.....	15	June 28	6	1,225	2	128
21	.....	.....	.....	.....	30	June 28	5	1,100	1	1,899
18	8	2	.....	10	10	June 28	5	1,125	1	1,582
24	.....	.....	.....	15	15	June 28	3	300	1	487

*Hay weight is obtained by adding fifteen per cent to the absolute dry weight.

EXPERIMENTS IN GROWING ALFALFA

Tests of the effect of nurse-crops, rates and methods of seeding, and lime and wood ashes were continued this year. All the alfalfa plots sown June 26, 1922, came through the winter in splendid condition. The plots sown without a nurse-crop on June 20, 1923, came through the winter in fair condition but those sown with a nurse-crop were rather uneven. The nurse-crop used both years was barley sown at the rate of one bushel per acre. This year, in order to test whether the degree of maturity had any effect on the yield, half of each plot was cut when twenty-five or fifty per cent in blossom and the other half was cut when in full bloom. The plot sown in 1922 grew a crop of corn in 1921. The plots sown in 1923 grew a crop of alfalfa in 1922. This alfalfa winter-killed and land was spring ploughed and reseeded with alfalfa. The lime plots were given a broadcast application of 6,000 pounds per acre of ground limestone in the spring before seeding. The plots with woodashes were given a broadcast application of 4,000 pounds per acre of hardwood ashes before seeding. All the seed was inoculated before sowing. The yields from both the 1922 and the 1923 seeding are shown in the accompanying tables.

ALFALFA EXPERIMENT (1922 SEEDING)
(1924 Yiel l s)

Plot No.	Method of seeding	With or without nurse crop	Limed or unlimed	Rate of seeding	Green weight				Hay				Total			
					First cutting		Second cutting		First cutting		Second cutting		Green weight		Hay	
				lb.	ton	lb.	ton	lb.	ton	lb.	ton	lb.	ton	lb.	ton	lb.
14	12" rows	Without	Wood ashes	10	12	1,554	4	363	3	353	1	383	16	1,917	4	736
15	24" rows	Without	Wood ashes	5	10	1,057	4	123	2	1,785	1	339	14	1,180	4	124
13	Broadcast	Without	Wood ashes	20	10	559	3	259	2	1,917		1,950	13	818	3	1,867
2	12" rows	Without	Limed	10	10	237	4	475	2	1,440	1	402	14	712	3	1,842
7	Broadcast	Without	Unlimed	20	9	1,148	2	1,695	2	1,991		1,798	12	843	3	1,789
3	24" rows	Without	Limed	5	8	1,538	3	1,944	2	1,362	1	218	12	1,482	3	1,580
1	Broadcast	Without	Limed	20	10	69	3	432	2	1,702		1,875	13	501	3	1,577
4	Broadcast	With	Limed	20	5	1,200	1	1,994	1	1,929		1,259	7	1,192	2	1,188
6	24" rows	With	Limed	5	8	106	3	749	2	847	1	171	11	855	3	1,018
8	12" rows	Without	Unlimed	10	7	1,059	3	579	2	620	1	151	10	1,638	3	771
12	24" rows	With	Unlimed	5	7	644	3	122	2	672		1,865	10	766	3	537
5	12" rows	With	Limed	10	6	1,556	2	1,283	2	787		1,634	9	839	3	421
10	Broadcast	With	Unlimed	20	7	396	2	210	2	764		1,455	9	606	3	219
11	12" rows	With	Unlimed	10	6	1,389	2	767	2	511		1,562	9	156	3	73
9	24" rows	Without	Unlimed	5	5	1,453	3	183	2	115		1,910	8	1,636	3	25

NOTE.—All plots except numbers 13, 14 and 15, which had wood ashes, were sown in duplicate.
One of the number 10 plots was eaten by midges and was disregarded.

ALFALFA EXPERIMENT—YIELD IN 1924 FROM 1923 SEEDING

Plot No.	Method of seeding	With or without nurse crop	Limed or unlimed	Rate of seeding per acre	Yield per acre green weight				Yield per acre Hay				Total yield			
					First cutting		Second cutting		First cutting		Second cutting		Green weight		Hay	
				lb.	ton	lb.	ton	lb.	ton	lb.	ton	lb.	ton	lb.	ton	lb.
A	Broadcast	Without	Limed	20	11	165	3	1,428	3	440	1	63	14	1,593	4	503
G	Broadcast	With	Unlimed	20	11	551	3	375	3	545		1,823	14	926	4	368
B	12" rows	Without	Limed	10	9	1,152	3	464	2	1,613		1,823	12	1,616	3	1,436
L	12" rows	With	Unlimed	10	8	1,722	3	163	2	1,211		1,836	11	1,885	3	1,047
C	24" rows	Without	Limed	5	7	1,193	2	1,329	2	718		1,660	10	522	3	378
I	24" rows	With	Unlimed	5	7	995	3	192	2	375		1,783	10	1,187	3	158
J	Broadcast	With	Unlimed	20	5	413	2	871	1	1,125		1,390	7	1,284	2	515
D	Broadcast	Without	Limed	20	4	1,982	1	1,745	1	1,118		1,125	6	1,727	2	243
K	12" rows	With	Unlimed	10	2	1,685	1	1,911		1,934		1,117	4	1,596	1	1,051
L	24" rows	With	Unlimed	5	2	263	2	444		1,508		1,311	4	707	1	819
E	12" rows	Without	Limed	10	2	1,860	1	1,257		1,785		979	4	1,117	1	764
F	24" rows	Without	Limed	5	2	1,372	1	1,091		1,689		946	4	463	1	635

TEST OF RED CLOVER SEED FROM DIFFERENT SOURCES

An experiment was begun in 1922 testing the general suitability of clover seed from different sources (for results from the 1922 seeding see Fredericton report for 1923, page 55.)

On June 20, 1923, red clover seed from the following sources: Ottawa; Late Swedish; Swedish Late; Medium Late Swedish; Early Swedish; Swedish Early; Alta Swede; St. Casimir, Quebec; St. Clet, Quebec; North Italy 539, and North Italy 540, were sown in fiftieth-acre plots. A good catch of seed was secured from all the varieties but in 1924 the stands were so poor that the yields were disregarded.

On June 11, 1924, a new series consisting of red clover seed from three Canadian and fifteen European sources was sown in either duplicate or triplicate $\frac{1}{100}$-acre plots. Good stands were secured and all the clovers went into the winter in good condition.

VARIETY TEST OF WHITE CLOVER FOR PASTURE

On June 11, 1924, four varieties of white clover were sown without a nurse-crop in duplicate $\frac{1}{100}$-acre plots. They included the following varieties: Wild White Scottish, White Dutch, Ladino, White Dutch Morso and White Dutch Stryno. Good stands were secured of all the varieties.

VARIETY TEST OF SWEET CLOVER

On June 11, 1924, six varieties of sweet clover were sown without a nurse-crop on duplicate $\frac{1}{100}$-acre plots. Good stands were secured on all the plots.

ANNUAL HAY CROP—TEFF GRASS

Duplicate $\frac{1}{100}$-acre plots were sown with Teff grass at the rate of seven pounds per acre on June 11. The plots were cut on September 19. The plots yielded an average of seven tons green weight, equal to 2 tons, 1,217 pounds hay. Hay weight obtained by adding fifteen per cent to the absolute dry weight.

EXPERIMENTS WITH FERTILIZERS

The work carried on during the year in co-operation with the Division of Chemistry included a fertilizer formulae experiment with a three-year rotation of potatoes, grain and hay; experiments to determine the value of basic slag, rock phosphate and superphosphate as a source of phosphoric acid; pasture fertilizer experiments with basic slag, superphosphate, lime and nitrate of soda; an experiment with fertilizer formulae for a growing orchard; an experiment with lime; and an experiment to determine the value of lime sludge—a by-product in the manufacture of pulp.

FERTILIZER FORMULAE EXPERIMENTS WITH A THREE-YEAR ROTATION

An experiment in which ten different fertilizer formulae were applied at three rates of application on a three-year rotation of potatoes, grain and hay, was begun in 1922. The potato and grain yields were given in the reports of this Station for 1922 and 1923 respectively. Ten pounds timothy, eight pounds red clover, and two pounds alsike clover per acre were sown with the grain. The seed failed to catch, therefore the land was fall ploughed and seeded in the spring with the same mixture without a nurse crop. Good catches of grass and clover were secured this year. A report of yields secured will be given at a later date. (Project C. 8.)

EXPERIMENT TO COMPARE DIFFERENT TYPES OF BASIC SLAG AS A SOURCE OF PHOSPHORIC ACID IN A COMPLETE FERTILIZER

The object of the experiment was to ascertain the relative values of various types of basic slag (fortified, open-hearth, Bessemer) ground rock phosphate, and superphosphate (with and without ground limestone) as sources of phosphoric acid when used in conjunction with nitrate of soda and muriate of potash.

The land was clay loam of rather low fertility. It was manured with 15 tons per acre barnyard manure in 1919, and with 1,350 pounds per acre 4-8-6 home-mixed fertilizer in 1922. The land was prepared for the experiment by fall ploughing and spring cultivation. All the plots, including the six checks, were given an application of 100 pounds nitrate of soda and 50 pounds muriate of potash per acre. Banner oats at the rate of three bushels per acre were sown on the 7th of June. Ten pounds timothy, eight pounds red clover and two pounds alsike clover per acre were sown when seeding the oats. The first lot of fertilizer was destroyed by fire, therefore the fertilizer was not applied until the 15th of June. (The yields of grain and straw are given in the report of this Station for 1923.) Good catches of grass and clover were secured. The light yields were due to the shortness of the growth rather than to the failure of the grass seed. The plots were cut twice, July 12 and September 24. The results are shown in the following table:—

BASIC SLAG EXPERIMENT

Yields of clover hay—2nd year of the rotation, 1924

Fertilizer applied	Per cent phosphoric acid	Rate of application per acre	Average yield per acre						Increased Yield over checks
			1st cutting		2nd cutting		Total		
		lb.	ton	lb.	ton	lb.	ton	lb.	lb.
XX Fortified slag	14	1,000	1	1,180		465	1	1,645	1,975
XX Fortified slag	14	500	1	625		210	1	835	1,165
XXX Fortified slag	17	825	1	985		255	1	1,240	1,570
XXX Fortified slag	17	412	1	145		210	1	355	685
Best of All slag	20	700	1	385		390	1	775	1,105
Best of All slag	20	350	1	445		630	1	1,075	1,405
Belgian slag	16·45	851		1,950		90	1	40	370
Belgian slag	16·45	425		1,500		105		1,605	−65
Superphosphate	16	875		1,770		120		1,890	220
Superphosphate	16	437		1,425		315		1,740	70
Superphosphate ground limestone.	16	437 / 4,000	1	265		465	1	730	1,060
Average 3 checks	.....	.....		1,330		340		x1,670	.....
Anglo-Canadian slag	16	875		1,395		120		1,515	1,065
Anglo-Canadian slag	16	437		1,380		120		1,500	1,050
English slag	16	875	1	370		270	1	640	190
English slag	16	437		885		90		975	525
Open Hearth slag	10–11	1,270		1,755		165		1,920	1,470
Open Hearth slag	10–11	635		1,155		75		1,230	780
Natural rock phosphate	28–30	1,000		390	.....			390	−60
Natural rock phosphate	28–30	500		375	.....			375	−75
Natural rock phosphate	28–30	250		780		120		900	450
Average 3 checks	.....	.....		450	.....			x450	.....

xThe field is divided into two sections, and the increase over the three checks in each section is shown rather than the increase over the average of the six checks because there was a great variation in the yield from the checks on the two sections of the field.

The results show that:—

(1) Phosphoric acid applied in the form of slag increased the yield of clover more than the same amount of phosphoric acid applied in the form of superphosphate.

(2) Ground limestone applied in conjunction with superphosphate increased the quantity and quality of clover.

(3) Phosphoric acid applied the previous year in the form of natural rock phosphate gave no increase on two of the three plots under experiment; on the third plot there was a fair increase in the yield of clover. (Project C. 26.)

EXPERIMENT TO COMPARE THE VALUE OF DIFFERENT SOURCES OF PHOSPHORIC ACID WHEN USED WITHOUT NITROGEN OR POTASH

The object of the experiment was to ascertain the relative value of the various types of slags (fortified, open-hearth, and Bessemer), ground rock phosphate, and superphosphate (with and without limestone) when used alone in a rotation of grain and hay.

The land was part of the same field and was given the same preparation as the land used in the previous experiment, (Basic slag as a source of phosphoric acid in a complete fertilizer.) The plots were sown on June 7, 1923 with Banner oats at the rate of three bushels per acre and seeded to hay with ten pounds timothy, eight pounds red clover, and two pounds alsike clover. Owing to a fire which destroyed the first lot of fertilizer, the fertilizer was not applied until June 15. The hay was cut on July 12 and again on September 24. A full report of the field will be given at a later date when more data are available. The results to date, however, show:—

(1) That when used without nitrogen or potash, phosphoric acid applied in all forms of slag gave better clover yields than when applied in the form of either superphosphate or natural rock phosphate.

(2) That the addition of ground limestone to superphosphate increased both the quality and quantity of the clover crop.

(3) That on this type of land natural rock phosphate alone has very little, if any, beneficial effect during the first two years following its application. (Project C. 138.)

PASTURE FERTILIZER EXPERIMENT

In order to study the effect of fertilizers on pastures, fertilizer tests were begun in 1923 with basic slag, superphosphate, nitrate of soda, ground limestone, and mixtures of ground limestone and superphosphate.

The land was a heavy clay loam, level and fairly uniform. It grew a crop of oats in 1918, and has been in permanent pasture since that date. The fertilizer was applied on May 11, 1923. The plots were cut on June 7, June 21, July 3 and August 1 in 1923. They were cut on June 4, June 20, July 11 and August 11 in 1924. In order to approximate grazing conditions, a lawn mower was used for cutting the grass. The grass from each plot was air-dried and shipped to the Chemistry Division at the Central Experimental Farm, Ottawa, for examination. The last two Autumns have been very dry and there was very little growth after the last cutting. The results are shown in the accompanying table.

PASTURE FERTILIZER EXPERIMENT

Yields of Grass (Green)—1923-24

Fertilizer used	No. of plots	Rate of application per acre	Yield per acre				Increased yield in 1924 over 1923	
			Green weight 1923		Green weight 1924			
		lb.	ton	lb.	ton	lb.	ton	lb.
Superphosphate and ground limestone	1	438 / 2,000	1	80	2	350	1	2270
Basic slag	2	750	1	622	2	531		1,909
Basic slag	2	1,000	1	755	2	553		1,798
Ground limestone	1	2,000	1	1,046	2	731		1,685
Superphosphate and ground limestone	1	438 / 1,000		700	2	368		1,668
Superphosphate	2	438	1	1,014	2	40		1,026
Nitrate of soda	2	100	1	165	1	1,174		1,009
Basic slag	2	250	1	374	1	1,303		929
Ground limestone	1	4,000	1	1,619	2	393		774
Basic slag	2	500	1	874	1	1,465		591
Nitrate of soda	2	200	1	577	1	1,062		485
Check	2	.....	1	194	1	693		499

xBoth the basic slag and the superphosphate contained 16% phosphoric acid.

The tabulated data show that:—

(1) Pasture lands of this character require both phosphoric acid and lime.

(2) The addition of ground limestone to superphosphate increased the yield of grass.

(3) Nitrate of soda applied in 1923 did not increase yields sufficiently to justify its use.

(4) When cost of material is taken into consideration, ground limestone gave the cheapest increase in yield. (Project C. 98.)

STOCK-CARRYING PROPERTIES OF NEW BRUNSWICK PASTURE SLAGGED VERSUS UNTREATED

An experiment comparing the gains which sheep will make on slagged and unslagged pasture has been conducted the last two years. On May 14, 1923, a one and one-half-acre plot was given an application of 750 pounds Bessemer slag (16 per cent) per acre. An adjoining plot of the same area was unfertilized. Sheep were pastured on these plots from May 30 to August 14 inclusive. In 1924 the area of each plot was reduced to one acre and they were used as sheep pastures from May 30 to August 19 inclusive. In 1923 the sheep on the slagged area made slightly larger gains. This year both lots of sheep made practically the same gains. More animals were placed on the slagged plot each season because it had a ranker spring growth. The maintenance of these extra animals during the period of scant pasture in July and August has been an added burden on the slagged plot. In future each plot will carry the same number of animals. Full details of this experiment will be reported at a later date.

ORCHARD FERTILIZER EXPERIMENT

The young orchard, set out in 1923 to determine which fertilizer formulae and rate of application would best promote growth, received another application of fertilizer. Buckwheat was grown between the rows and ploughed under. A full report of this experiment will be made at a later date. (Project C. 99.)

LIME EXPERIMENT

This year, an acre which was given an application of 5,000 pounds waste lime in 1915 yielded 2,230 pounds hay. An adjoining acre which was not limed yielded 820 pounds of hay, an increase of 1,410 pounds per acre for the limed

acre. A strip 15 feet wide and 306 feet long which was given an application of ground limestone at the rate of 4,000 pounds per acre in the autumn of 1922 gave a hay yield of 300 pounds, or at the rate of 2,847 pounds per acre. An adjoining strip of the same area, which was unlimed, gave a hay yield of 100 pounds, or at the rate of 949 pounds per acre, an increase of 1,904 pounds per acre for the limed area. The field on which these experiments were carried on is a uniform clay loam. Except for liming all the field has had the same treatment since 1915. The waste lime applied in 1915 was coarse and no results were noted until 1921, when the limed acre yielded 680 pounds more hay than an unlimed acre which had otherwise been given the same treatment. The increased yield on the limed plots this year was largely due to the better catches of clover. The hay on the limed plots was largely clover, while the hay on the unlimed parts of the field was a mixture of timothy and sorrel, with very little clover. The yields on all the plots were small owing to the extremely dry weather in June and July, but the results indicate that this type of land requires lime in order to insure a good catch of clover. (Project C. 39.)

GROUND LIMESTONE VERSUS LIME SLUDGE

An experiment was begun this year testing the value of wet and dry lime sludge as compared with ground limestone. (This sludge is a by-product from the manufacture of pulp and contains, when dry, over 90 per cent lime carbonate.) The land used in the experiment had not received any previous application of manure or fertilizer. It was a rough, bush pasture which was broken in 1922 and allowed to lie fallow until the fall of 1923 when it was ploughed again. This spring it was put into a good state of cultivation. The experiment was conducted on one-tenth acre plots. The sludge and lime were applied on June 14, and the plots were sown with Waugh strain of Banner oats at the rate of three bushels per acre on the same date. The grain was cut on September 12. The results are shown in the following table:—

GROUND LIMESTONE VS. LIME SLUDGE EXPERIMENT

Crop Yields—Oats

Material	Rate of application per acre	Yield of grain per acre	Yield of straw per acre	
	lb.	lb.	tons.	lb.
Wet sludge	10,000	58·1	1	541
Dry sludge	5,000	53·7	1	729
Ground limestone	5,000	50·6		1,989
Check		50·2		1,304

Results indicate that the lime in the form of sludge is more readily available than in the form of ground limestone.

The plots were seeded, when sowing the oats, with ten pounds timothy, eight pounds red clover, and two pounds alsike. There were very good catches of seed on all the plots. (Project C. 140.)

POULTRY

Three breeds of poultry are kept at this Station, Barred Rock hens, Toulouse geese and Pekin ducks. The stock on hand December 31, 1924, consisted of:—

Barred Rocks: 4 males, 60 hens, 135 pullets, 58 cockerels.
Toulouse Geese: 2 ganders, 4 geese.
Pekin Ducks: 4 drakes, 8 ducks.

The work in this division for the year included pedigree breeding, feeding experiments, egg-laying contest work and an investigation of methods of control of fowl typhoid.

HATCHING RESULTS

Two incubators were used during the season, a 2,420-egg Buckeye with an electric fan system for the circulation of the air, and a 250-egg Tamlin. The general hatching results were as follows:—

HATCHING RESULTS

Total eggs set	3,449·0
Number fertile	2,915·0
Per cent fertile	84·5
Number of chicks	1,461·0
Per cent total eggs hatched	42·3
Per cent fertile eggs hatched	50·1
Number of chicks alive when wing banded	735·0
Per cent chicks hatched alive when wing banded	50·3
Total eggs required for one chick hatched	2·3
Total fertile eggs for 1 chick hatched	1·9
Total eggs required for one chick when wing banded	4·6

BEST DATE FOR INCUBATION

The hatching results from eggs set at different dates in the Buckeye machine were as shown in the accompanying table.

HATCHING RESULTS FROM SETTINGS OF DIFFERENT DATES

—	Setting Mar. 26	Setting April 3	Setting April 11	Setting April 24	Setting May 2	Setting May 13
Total eggs set	484	484	484	484	452	603
Number fertile	379	424	437	425	375	509
Per cent fertile	78·3	87·6	90·2	87·8	82·9	84·4
Number of chicks	165	266	286	241	201	213
Per cent total eggs hatched	34·09	54·95	59·09	49·7	44·4	35·32
Per cent fertile eggs hatched	43·5	62·7	65·4	56·7	53·6	41·84
Number chicks alive when wing banded	82	137	95	115	101	126
Per cent chicks hatched alive when wing banded	49·6	51·5	33·2	47·7	50·2	59·1
Total eggs required for one chick hatched	2·9	1·81	1·69	2·0	2·2	2·8
Total fertile eggs for one chick hatched	2·2	1·5	1·5	1·7	1·8	2·3
Total eggs required for one chick when wing banded	5·9	3·5	5·09	4·2	4·4	4·7

HATCHING RESULTS FROM HENS AND PULLETS

Only a small percentage of the eggs used for hatching were from pullets. The results were as shown in the following table:—

HATCHING RESULTS FROM HEN AND PULLET EGGS

—	Hens	Pullets
Total eggs set	3,293	156
Number fertile	2,790	125
Per cent fertile	84·7	80·1
Number of chicks	1412	49
Per cent total eggs hatched	42·8	31·4
Per cent fertile eggs hatched	50·6	39·2
Number chicks alive when wing banded	711	24
Per cent chicks hatched alive when wing banded	50·3	48·9
Total eggs required for one chick hatched	2·3	3·1
Total fertile eggs for one chick hatched	1·9	2·5
Total eggs required for one chick when wing banded	4·6	6·5

REARING COST

The cost of rearing the chickens until November 1 was as follows:—

COST OF REARING CHICKS

Number of eggs set	3,449
Number of chicks hatched	1,461
Number of chicks reared	571

Statement of Cost

3,449 eggs at 50c. per doz	$ 143 70
88 gal. kerosene oil at 26c	22 88
4,090 lb. hard coal at $18 per ton	36 81
90 lb. rolled oats at $3.15 per 90 lb	3 15
90 lb. rolled oats at $3.20 per 90 lb	3 20
360 lb. rolled oats at $3 per 90 lb	12 00
100 lb. chick grain at $4.25 per cwt	4 25
300 lb. chick grain at $3.60 per cwt	10 80
200 lb. crimped oats at $2.20 per cwt	4 40
400 lb. crimped oats at $2.25 per cwt	9 00
600 lb. corn meal at $2.30 per cwt	13 80
600 lb. middlings at $2 per cwt	12 00
300 lb. wheat bran at $1.55 per cwt	4 65
50 lb. charcoal at $4 per cwt	2 00
460 lb. wheat at $2.25 per cwt	10 35
400 lb. cracked corn at $2.30 per cwt	9 20
100 lb. oats at $1.80 per cwt	1 80
100 lb. beef scrap at $4.75 per cwt	4 75
5,350 lb. grain at $2.11 per cwt	112 88
3,070 lb. mash at $1.92 per cwt	58 94
7,225 lb. buttermilk at 15c. per cwt	10 83
Total cost of chicks, labour neglected	491 39
Average cost per chick to November 1	0 86

COST OF EGG PRODUCTION

The average cost of egg production as determined from the record of two hundred hens in the New Brunswick Egg-laying Contest was as follows:—

COST OF EGG PRODUCTION

——	Number eggs laid	Per cent production	Food cost per doz.	Price per doz.	Profit per doz.	Loss per doz.
			$	$	$	$
Nov. 1 to Nov. 28	680	12·1	0·601	0·55	.....	0·051
Nov. 29 to Dec. 26	2,028	36·2	0·217	0·65	0·433	.....
Dec. 27 to Jan. 23	1,554	27·7	0·285	0·65	0·365	.....
Jan. 24 to Feb. 20	1,759	31·4	0·288	0·53	0·242	.....
Feb. 21 to Mar. 19	3,015	53·8	0·172	0·50	0·328	.....
March 20 to April 16	3,341	59·6	0·166	0·35	0·184	.....
April 17 to May 14	3,575	63·8	0·157	0·27	0·118	.....
May 15 to June 11	3,356	59·9	0·163	0·30	0·137	.....
June 12 to July 9	3,226	57·6	0·149	0·30	0·151	.....
July 10 to Aug. 6	3,345	59·7	0·159	0·30	0·141	.....
Aug. 7 to Sept. 3	3,160	56·4	0·173	0·30	0·127	.....
Sept. 4 to Oct. 1	2,494	44·5	0·213	0·35	0·137	.....
Oct. 2 to Oct. 29	1,473	26·3	0·276	0·40	0·124	.....
Year	33,006	45·3	0·196	.....	.....	.....

These results, as well as the results of previous years, emphasize the importance of winter egg production.

STANDARD GRAIN AND MASH VERSUS COMMERCIAL GRAIN AND MASH

In order to determine the relative value of home-mixed and commercial poultry feeds an experiment was conducted with two pens of Barred Plymouth Rocks. The experiment was begun November 15, but the records for comparison were not taken until December 1. Pen 4 was fed a commercial mash and scratch feed. Pen 3 was fed a home-mixed grain mixture consisting of two parts cracked corn, two parts wheat and one part oats, and a home-mixed mash consisting of

equal parts corn meal, wheat bran, middlings and ground oats. Beef scrap was fed to this pen in a hopper. The scratch grains were fed in deep litter and the mashes were fed in hoppers. Green feed, grit, shell and buttermilk were supplied to each pen. The results were as shown in the following table:—

STANDARD VS. COMMERCIAL GRAIN AND MASH

—		Home-mixed feed Pen 3	Commercial feed Pen 4
Number of days in experiment		122	122
Number of birds in experiment		25	25
Home-mixed scratch feed eaten in period	lb.	407	.....
Commercial scratch feed eaten in period	lb.	.....	420
Home-mixed mash eaten in period		163	.....
Commercial mash eaten in period	lb.	.....	258
Beef scrap eaten in period	lb.	103	.....
Buttermilk fed in period	lb.	276	276
Green feed fed in period	lb.	445	445
Grit fed in period	lb.	10	13
Shell fed in period	lb.	24	28
Total number of eggs laid in period		577	699
Average number of eggs per bird		23·0	27·9
Statement of Cost			
Home-mixed scratch feed at $2.25 per cwt	$	9·16	.....
Commercial scratch feed at $3·125 per cwt	$	.....	13·12
Home-mixed mash at $1.95 per cwt	$	3·17	.....
Beef scrap at $4 per cwt	$	4·12	.....
Commercial mash at $3·225 per cwt	$	.....	8·32
Buttermilk at 15c. per cwt	$	0·41	0·41
Green feed at 25c. per cwt	$	1·11	1·11
Grit at $1.50 per cwt	$	0·15	0·20
Shell at $1.50 per cwt	$	0·36	0·42
Total cost of feed	$	18·48	23·58
Cost of eggs per dozen	$	0·384	0·404
Total value of eggs	$	23·80	29·48
Profit on pen	$	5·32	5·90

The number of eggs laid by each pen and the price for the month was as follows:—

Month	Home-mixed	Commercial	Price of eggs per dozen
	No. of eggs	No. of eggs	$
December	40	72	0·65
January	60	81	0·65
February	121	175	0·50
March	356	371	0·45

This experiment was carried on during two previous years. During these years the pens fed the home-mixed feed laid the most eggs, although the difference was not very large. This difference was greater during the first year of the experiment, when the profit was quite decidedly in favour of the home-mixed feed. Since then the profit from the two pens has been fairly equal.

BUTTERMILK VERSUS BEEF SCRAP

In order to determine the relative value of buttermilk and beef scrap for egg production an experiment was carried on with two pens of Barred Plymouth Rocks. The experiment began November 15, but the records were not taken for comparison until December 1. Each pen was fed a grain mixture consisting of two parts cracked corn, two parts wheat and one part oats in the litter, and

a mash consisting of equal parts corn meal, wheat bran, middlings and crushed oats in hoppers. Pen 1 received buttermilk as its protein feed and Pen 2, beef scrap. The analysis of the beef scrap was quoted as being between 40 and 50 per cent protein and 8 and 12 per cent fat. The beef scrap was fed in hoppers. Green feed, grit and oyster-shell were supplied to each pen. The results were as follows:—

BUTTERMILK VERSUS BEEF SCRAP FOR EGG PRODUCTION

—		Buttermilk Pen 1	Beef Scrap Pen 2
Number of days in experiment		122	122
Number of birds in experiment		25	25
Scratch feed eaten during period	lb.	409	410
Mash eaten during period	lb.	335	275
Green feed eaten during period	lb.	445	445
Grit eaten during period	lb.	7	11
Shell eaten during period	lb.	35	26
Buttermilk fed during period	lb.	728	.....
Beef scrap fed during period	lb.	.....	83
Total eggs laid during period		1,027	611
Average number eggs per bird during period		41·0	24·4
Statement of Cost			
Scratch feed at $2.25 per cwt	$	9·20	9·22
Mash at $1.95 per cwt	$	6·53	5·36
Green feed at 25c. per cwt	$	1·11	1·11
Grit at $1.50 per cwt	$	0·11	0·17
Shell at $1.50 per cwt	$	0·53	0·39
Buttermilk at 15c. per cwt	$	1·09	.....
Beef scrap at $4 per cwt	$	.....	3·32
Total cost of feed	$	18·57	19·57
Cost of eggs per dozen	$	0·216	0·384
Total value of eggs	$	46·49	26·29
Profit on pen	$	27·92	6·72

The number of eggs laid by each pen and the price obtained each month were as follows:—

Month	Buttermilk	Beef Scrap	Price of Eggs
	No. of eggs	No. of eggs	$
December	231	70	0·65
January	191	95	0·65
February	231	144	0·50
March	374	303	0·45

This experiment was carried on with skim-milk instead of buttermilk in 1921 and 1922. In 1922 and 1923 buttermilk was used, and the difference was decidedly in favour of the beef scrap. Previous to this year a 60 per cent protein beef scrap was fed. The beef scrap used this year was of a lower grade.

BEST GREEN FEED FOR POULTRY

In order to determine the relative value of swedes and mangels as green feed for poultry an experiment was begun November 15 with two pens of Barred Rock pullets. The records for comparison were not taken until December 1. Each pen was fed a grain mixture consisting of two parts cracked corn, two parts wheat and one part oats in deep litter. A mash consisting of equal parts corn meal, wheat bran, middlings and ground oats was kept in hoppers before the birds at all times. Beef scrap, grit and shell were fed in hoppers and buttermilk was supplied daily. The results were as follows:—

TURNIPS VERSUS MANGELS FOR GREEN FEED FOR EGG PRODUCTION

—		Turnips Pen 5	Mangels Pen 6
Number of days in experiment		152	152
Number of birds in experiment		20*	20*
Scratch feed eaten in period	lb.	375	375
Mash eaten in period	lb.	220	200
Beef scrap eaten in period	lb.	67	90
Buttermilk eaten in period	lb.	351	351
Grit eaten in period	lb.	13	14
Shell eaten in period	lb.	32	34
Turnips eaten in period	lb.	414	.....
Mangels eaten in period	lb.	.....	403
Total number of eggs laid in period		869	937
Statement of Cost			
Scratch feed at $2.25 per cwt	$	8·44	8·44
Mash at $1.95 per cwt	$	4·29	3·90
Beef scrap at $4 per cwt	$	2·68	3·60
Buttermilk at 15c. per cwt	$	0·52	0·52
Grit at $1.50 per cwt	$	0·19	0·21
Shell at $1.50 per cwt	$	0·48	0·51
Turnips at 25c. per cwt	$	1·03	.....
Mangels at 25c. per cwt	$	.....	1·01
Total cost of feed	$	17·63	18·19
Cost of eggs per dozen	$	0·243	0·232
Total value of eggs	$	31·87	35·64
Profit on pen	$	14·24	17·45

*The number of hens in each pen was reduced to 19 February 19.

The number of eggs laid by each pen and the price obtained each month were as follows:—

Month	Turnips	Mangels	Price of Eggs per doz
	No. of eggs	No. of eggs	$
December	84	167	0·65
January	160	141	0·65
February	124	123	0·50
March	184	199	0·45
April	317	307	0·25

NEW BRUNSWICK EGG-LAYING CONTEST

The fourth New Brunswick Egg-laying Contest was completed on the 29th of October. There were twenty pens entered in this contest. The average production was 165 eggs as compared with 162.25 in 1923, 138.43 in 1922, and 152.13 in 1921.

Seventy-eight hens laid between 150 and 200 eggs each.

Twenty-three hens laid between 200 and 225 eggs each.

Seventeen hens laid over 225 eggs each.

Eighteen out of the forty hens that laid over 200 eggs qualified for registration. The balance were disqualified on account of their eggs weighing under 24 ounces per dozen.

The system of feeding was as follows:—

Scratch feed, consisting of two parts cracked corn, one part wheat and one part oats, was fed in the litter in the morning and afternoon until February 1, when the corn was reduced to one part.

Dry mash consisting of equal parts wheat bran, middlings, corn meal, ground oats and beef scrap was kept in hoppers before the birds at all times.

Grit, oyster-shell and charcoal were kept in hoppers available to the birds at all times. Green feed, water and buttermilk were also supplied daily.

The hens qualifying for registration were all Barred Rocks. Their production and their breeders are shown in the following table:—

REGISTRATION OF HENS ENTERED IN EGG-LAYING CONTEST

Pen breeder	Leg band	Chick band	Wing label	Breeder's mark right wing	Tatoo No. left wing	Egg record	Weight per dozen
	NBLCD						
1. Mrs. F. McAlpine	11	.....	.....	J.E.	1B	200	24·1
2. Eugene Monahan	25	.....	.....	B.O.	1B	212	24·0
3. C. M. Peart	32	.....	.....	D.R.	1B	207	26·9
4. A. T. Reid	45	R11	CNPRA4	B.Q.	1B	223	26·4
4. A. T. Reid	46	.....	.....	B.Q.	2B	229	26·1
5. Harry Patterson	60	.....	.....	B.P.	1B	230	24·2
7. N. W. Eveleigh	72	.....	.....	H.W.	1B	223	24·9
7. N. W. Eveleigh	80	.....	.....	H.W.	2B	214	24·0
8. Geo. Wood	90	.....	.....	L.T.	1B	204	24·5
9. W. E. B. Tait	92	.....	.....	B.N.	1B	222	24·2
9. W. E. B. Tait	93	.....	.....	B.N.	2B	206	25·1
9. W. E. B. Tait	94	.....	.....	B.N.	3B	200	25·6
9. W. E. B. Tait	98	.....	.....	B.N.	4B	248	24·9
11. John Moore	114	.....	.....	J.V.	1B	234	25·8
11. John Moore	118	.....	.....	J.V.	2B	209	24·4
12. A. S. C. Stevens	127	.....	.....	D.T.	1B	205	24·2
13. D. Mersereau	140	.....	.....	F.Z.	1B	208	25·0
18. Charlottetown Exp. Station	188	.....	.....	A.T.	4B	235	24·5

Full details of the contest will be found in the new bulletin issued by the Dominion Experimental Farms covering all the Canadian National Egg-Laying Contests of 1923 and 1924. Apply to the Publication Branch, Department of Agriculture, Ottawa.

CONTROL OF FOWL TYPHOID

Considerable difficulty has been experienced at this Station for several years in rearing chicks. A form of diarrhoea would develop when the chicks were about a week old, and the mortality from that time until about the eighteenth day was heavy. The epidemic was apparently worse some years than others, as is indicated by the following table:—

Year	Eggs set	Chicks hatched	Chicks alive July 31	Source of Chicks	
				Hens	Pullets
			per cent	per cent	per cent
1919	3,078	1,086	32·04	.....	100·0
1920	2,407	809	54·26	62·05	37·94
1921	2,521	1,050	29·52	82·95	17·04
1922	2,220	1,089	58·4	100·0	.....
1923	3,403	1,194	22·19	56·11	43·88
1924	3,449	1,461	42·43	96·64	3·35

In 1923 the mortality was particularly heavy. This disease did not manifest itself physically in the stock after it passed the chick stage. What the effect was on egg production is problematical. Egg production was comparatively low following the severe epidemic of 1923. Following 1922, when the

epidemic was relatively light, egg production was high, but it has been later determined that several infected birds from that season had records of over 200 eggs. Out of twelve birds hatched in 1922 which later qualified for registration, only three reacted.

In February 1924 a number of hens were sent to Ottawa for examination. The result of this examination indicated the presence of an organism in these birds resembling *Eberthella sanguinarium* which causes foul typhoid.

All efforts to control the development of this disease in the young chicks in the past through sanitary measures were ineffective. Feeding buttermilk was of no use. Tomatoes were fed quite extensively in 1922, but not in a comparative way.

Experiments were begun during the past season to determine the results from the feeding of a culture of *Bacillus Acidophilus* and tomatoes. The use of this organism was adopted from the practice of human medicine. No record had ever been noted of its use for poultry. Both broth and milk cultures of this organism were used. The object was to colonize this organism in the gut of the young chicks in an effort to control the growth of the pathogenic organism. In order to provide food for the development of the organism in the gut of the chicks, lactose or milk sugar was fed with the culture. No definite conclusions could be drawn from the results of this season's work which was of necessity largely in the form of preliminary work. With some hatches there was evidence of beneficial results, while with others no benefits were observable. It was impossible to determine whether this is due to difference in the virility of the cultures used, or in the stock.

While the influence of the dam was undoubtedly of primary importance, this disease spread rapidly in the brooder. In 1924, out of thirty-one chickens from an isolated pen of registered hens hatched April 24 with plant chickens, and reared with the plant chickens, twenty-six died, three reacted, and two did not react. Out of thirty chickens from the same pen of hens, hatched separately, twelve days later than, and reared away from the main plant chicks, six died, two reacted and twenty-two did not react.

Vaccination was also tried on one hatch without any beneficial results.

In November blood specimens were taken from every bird in our flock that was considered good enough for breeding. A test was made with the blood serum in an effort to eliminate the reactors. The results of this test were as follows:—

TESTING FOR FOWL TYPHOID

Class	No. tested	Negative	Positive	Per cent positive
Plant Stock—				
Aged females	74	39	35	47·3
Young females	214	134	80	37·3
Young males	43	30	13	30·2
1923 Registered Hens and Progeny—				
Aged females	13	10	3	23·0
Young females	23	22	1	4·3
Young males	19	18	1	5·2
Totals	386	253	133	34·4
Sex Totals—				
Females	324	205	119	36·7
Males	62	48	14	20·7

These reactors were slaughtered, and the effect on the 1925 chick crop will be watched very closely. It is not expected that this disease will be wiped out in one year, but blood tests will be made annually for a few years in an effort to completely eliminate this infection.

Twenty reacting hens and two reacting cockerels were sent to Ottawa during December for investigational purposes.

No hatching eggs will be sold from this Station until such time as it has been fairly definitely determined that this infection has been wiped out. Cockerels will only be sold on a test showing.

BEES

The apiary at this Station consists of forty-three colonies, an increase of three colonies over the previous year. Forty colonies were placed in winter quarters in the fall of 1923. Only thirty-one remained after the weak and queenless colonies were united in the spring. Fifteen increases were made from these colonies, and 931 pounds of honey, or an average of 30.0 pounds per hive. The highest production from one colony was 90 pounds. The average production of the sixteen colonies that were not divided for increase was 51.8 pounds.

CONTROL OF SWARMING BY DEQUEENING AND REQUEENING

In order to determine if swarming can be prevented by dequeening and requeening, an experiment was carried on with three colonies that made preparation for swarming. As soon as larvae were found in queen cells, they were destroyed and the queen removed. Nine or ten days later these colonies were gone over and the queen cells destroyed again and a young laying queen introduced. In one of these colonies a virgin was found on the second examination, which was probably hatched from a cell that was overlooked. None of these colonies made any further preparation for swarming. (Project Ap. 1.)

CONTROL OF SWARMING BY SEPARATION OF QUEEN AND BROOD

In order to determine if swarming can be prevented by separation of the queen from the brood, an experiment was carried on with three colonies which had made preparations for swarming. As soon as larvae were found in queen cells in these colonies all the combs containing brood were removed from the brood chamber and replaced with drawn comb. The queen was left in the brood chamber on the empty combs, and the bees from one frame of brood were shaken down with the queen. An excluder was placed over the brood chamber, and the brood was placed in a super on top of the hive over an extracting super. A queen excluder was placed between the extracting super and the one containing the brood. The queen cells in the upper super were not destroyed. In two of the colonies the young queens were apparently destroyed as soon as they were hatched. In the third colony a virgin queen was allowed to live and in three weeks began to lay. This queen was then removed. None of these colonies made any further preparations for swarming.

This is the first year that these experiments on swarm control have been carried on at this Station. A fair comparison of the honey crop from the colonies treated in the different ways is not possible this year on account of unequal strength of the colonies in the spring, and the manipulation in order to strengthen them. The system of separating the queen and brood takes less time than the other method of control tested, and does away with the uncertainty incidental to procuring a queen for requeening. (Project Ap. 2.)

METHODS OF DETECTING PREPARATION FOR SWARMING

In order to determine if preparation for swarming could be detected by the use of the double brood chamber, shallow supers were placed over the brood chambers of the ten-frame Langstroth colonies in the spring as soon as the bees showed signs of needing more room. No excluder was placed between these supers and the queen was allowed to lay in the shallow supers. When the

colonies were examined at intervals of ten days, the shallow supers were tipped in order to determine if queen cells could be observed on the lower edges of the combs in the shallow super, and without examining every comb of brood, queen cells were found in eight colonies. In four of these the queen cells were observable by tipping the shallow super.

This was the first year that this experiment has been carried on. It was found that the shallow supers need to be put on earlier in the season than they were this year. (Project Ap. 5.)

PACKAGE BEES AS A MEANS OF STARTING COLONIES

Two three-pound packages of bees with queens were imported from Alabama. These were forwarded by mail and arrived May 26 and 28 in first-class condition. The evening they arrived they were released in a super over the brood chamber on drawn comb with a little honey. They built up rapidly, but unfortunately one of the packages had an old queen loose among the bees. This old queen was superceded in the fall. On account of the failing queen, the colony was rather weak in the fall, and its honey production was only 21 pounds. The other package produced 56 pounds of honey. (Project Ap. 22.)

OUTDOOR VERSUS CELLAR WINTERING

In order to determine whether wintering bees in the cellar or outdoors in packing cases will give the more satisfactory results for this district, twelve colonies were packed outdoors and twenty-eight colonies were placed in a cellar.

Eight colonies were packed in two four-colony packing cases with five inches of planer shavings on the bottom and sides, and eight inches on top. Four colonies were packed in two two-colony cases with six inches of packing on bottom and sides, and eight inches on top. Two of the colonies wintered in the outdoor packing cases died, and seven of the cellared colonies were so weak that they had to be united to other colonies.

The colonies wintered in packing cases outside built up more rapidly in the spring than the cellared bees. (Project Ap. 30.)

QUEEN REARING

In order to determine the best method of rearing queens under local conditions, two systems of queen rearing were tried during the year. From the centre of one of the best colonies containing an Italian queen, a frame of brood was taken on June 28. This was replaced by a frame with three triangular pieces of foundation fastened to the top bar. By July 7 this foundation was drawn out and contained larvæ at the top and eggs in the bottom cells. The cells along the lower edge of the foundation were cut back to day-old larvæ, and this frame was then transferred to a strong colony that had been made queenless twelve hours previous. Five days later nineteen queen cells were found on this frame. Nine of the best of these, conveniently located along the lower edge, were allowed to develop, and the remainder were destroyed. Four days later these cells were transferred to mating boxes. Seven young queens were successfully mated.

After the frame was removed from the first colony containing the queen mother, it was replaced by a frame containing a full sheet of foundation. When this was drawn out and filled with hatching eggs it was removed from the colony and every second and third row of cells lengthwise and crosswise were destroyed. This frame was then laid flat, prepared side down, over the brood-nest of a colony that had been made queenless. An inch block was placed under each corner of the frame in order to allow the bees to draw out the cells. Twenty cells were started on this frame; nine were selected and placed in mating boxes; seven of these were successfully mated.

This was the first year that these methods of queen rearing had been tried at this Station. Both methods gave good queens. The first method required less time and the cells were more easily removed and with less risk. This method was not so wasteful. Less bee energy was lost in drawing out the foundation, and the frame could be used again, while with the latter method the frame was of no further use.

In the spring four colonies were removed to an out-apiary in order to obtain better pasturage for the bees. These four colonies produced 257 pounds of honey, or an average of 64 pounds 4 ounces per colony, and one colony increase. These colonies were removed back in the fall.

An outbreak of American Foul Brood developed during the latter part of August in one colony. This colony was destroyed. It has not been ascertained where the infection came from.

A number of colonies were transferred to Jumbo hives during the season and these will be compared with the ten-frame Langstroth hives.

All colonies were fed sugar syrup for winter and brought up to an average of 66 pounds in weight. Twelve colonies were packed in four-colony packing cases, eight colonies in two-colony packing cases, and twenty-three in the cellar for the winter 1924-25.

FIBRE DIVISION

The work in this division included variety test of flax and hemp and tests of dates of seeding Riga Blue flax and Minnesota No. 8 hemp. All the work was carried on in triplicate, and the plots were one-sixtieth of an acre when one foot was taken off the edges to approximate field conditions.

The land on which the experiments were carried on was a sandy loam underlaid at a depth of 3½ to 4 feet with hard-pan. It had been in grass plots the two previous years. The land was fall ploughed. In the spring it was given a broadcast application of barnyard manure at the rate of 15 tons per acre, and of home-mixed 4-8-6 fertilizer at the rate of 800 pounds per acre. The land was then thoroughly disked. The flax and hemp were sown broadcast and covered with the spike-tooth harrow. The flax and hemp were stooked in the field and when dry they were weighed and shipped to Ottawa.

VARIETY TEST OF FIBRE FLAX

In order to determine the best variety of flax for fibre and seed, four varieties were sown on May 12 at the rate of 1½ bushels per acre. The flax was pulled on August 4. Saginaw and Longstem lodged slightly. Except where the plot lodged the flax was all golden coloured and 50 per cent of the seed balls were brown. The results are shown in the following table. (Project E. 3.)

FIBRE FLAX—TEST OF VARIETIES

Variety	Height	Yield straw per acre	Yield seed per acre	Yield fibre per acre	Yield tow per acre
	in.	tons lb.	bushels	lb.	lb.
Saginaw	36-40	3 240	12·7	660	290
Longstem	36-40	3 480	13·3	580	290
Riga Blue	32-34	3	14·8	560	260
Pure Line No. 5	24-34	2 1,880	16·5	550	310

SOWING FLAX ON DIFFERENT DATES

The test of the best date to sow fibre flax begun in 1923 was continued this year with the same variety, Riga Blue. Owing to a more favourable season the first seeding this year was on May 12, whereas in 1923 the first seeding was on June 6. The results are shown in the following table:—

FIBRE FLAX—SOWING AT DIFFERENT DATES

Date sown	Date pulled	Height	Yield per acre			
			Straw	Seed	Fibre	Tow
			tons lb.	bush.	lb.	lb.
May 12	August 4	32-34	2 1,966	14·8	560	260
" 20	" 6	34-35	3 200	15·9	530	230
June 3	" 16	34-36	2 1,420	16·7	380	240
" 9	" 25	33-34	2 1,740	16·4	410	230

In 1923 a sowing on June 27 gave the highest yields of straw and tow and a sowing on June 13 gave the highest yield of fibre. (Project E. 7.)

VARIETY TEST OF HEMP

In order to determine which variety of hemp would give the largest yield of fibre, two varieties, Chington and Minnesota No. 8, were sown on May 12. Only 10 per cent of the Minnesota No. 8 seed germinated. It was therefore ploughed under. The Chington was an excellent stand and averaged 7½ feet in height and yielded an average of 5 tons 200 pounds of straw, 984 pounds fibre, and 250 pounds tow per acre. (Project E. 4.)

SOWING HEMP AT DIFFERENT DATES

Sowings of Minnesota No. 8 hemp were made five different dates, a week apart, commencing May 12. The seed did not germinate. (Project E. 8.)

EXTENSION WORK

The plan adopted the two previous years of holding a number of special field-days rather than one large excursion was again followed this year. The success of these field-days is evidenced by the fact that approximately four thousand people visited the Station in groups ranging from a few persons to six hundred people. Each year has shown more clearly the advantage of this system. With the small excursions it was easy to ascertain the particular phase of farming in which the visitors were interested, and the experimental work which had a direct bearing on their problems was used to special advantage. The members of the staff were also able to give each visitor more individual attention than would have been possible if a large number of people were present.

Excursions were held at the Station by agricultural societies either singly or in groups of two or more societies. The attendance at these excursions ranged from thirty to one hundred people.

The Third Annual Poultry Field-Day was held with an attendance of one hundred poultrymen representing practically every section of the province. The program consisted mainly of judging contests, demonstrations in culling, addresses and discussions on matters relating to the poultry industry. The New Brunswick Poultry Producers' Association also held a short session and dealt with a number of important matters.

The Annual Potato Field-Day continues to increase in popularity. Six hundred people were present in 1924 as compared with two hundred in 1923. The forenoon was devoted to dusting and spraying demonstrations and the inspecting of the potato experimental work conducted at the Station. During the afternoon, addresses were delivered on various subjects, including potato inspection, insecticides, fungicides, and markets. The balance of the day was taken up by the New Brunswick Potato Growers' Association.

Conferences were held by the Illustration Station operators and the New Brunswick branch of the Canadian Society of Technical Agriculturists. These conferences brought together men who were engaged in agricultural work in different parts of the province and resulted in a helpful exchange of views on the problems connected with agriculture.

The members of the Fredericton Rotary Club, City Club, Board of Trade, City Council, prominent business men, and representatives of the adjoining Agricultural Societies were entertained at the Station early in the summer. A number of addresses were delivered relating to agriculture and an effort was made to make the work of the Station better understood and appreciated. Between seventy-five and eighty live stock and agricultural exhibitors were also entertained at the time of the Fredericton Exhibition.

A very successful meeting was held at the Station by the neighbouring farmers. As a result of this meeting, a movement was begun which resulted in a start being made in growing registered seed grain.

It should also be stated that the Normal School students, the members of the New Brunswick Fruit Growers' Association, the High School boys and girls from Woodstock, and the junior farmers from Wirral were also received by the officials of the Station.

An exhibit featuring soil fertility was shown at St. John, Woodstock and Fredericton Exhibitions. Members of the staff judged at a number of the fall fairs and addressed several farmers' meetings. Articles on farm topics were written for the press and for Seasonable Hints.

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