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 1922

No. 7. Normal School students inspecting Experimental plots at the Fredericton Station.

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1923

EXPERIMENTAL STATION, FREDERICTON, N.B.

REPORT OF THE SUPERINTENDENT, C. F. BAILEY

THE SEASON

The winter of 1921-22 though long, was not severe, being remarkably free from bad storms and extremes of temperature. Snow fell on the 2nd, 4th and 5th of November, and all stock had to be housed. A thaw on November 19 and 20 removed this snow and the ground was partially bare until the 5th of January, after which date the ground was evenly covered with snow until the 6th of March. The absence of bad storms, the even temperature and moderate depth of snow were very favourable to the orchard and new-seeded land, both of which came through the winter in excellent condition.

The remaining snow was removed by a heavy rain on March 8. This rain, owing to the frozen state of the soil, ran off and, as the drought of the previous summer had left very little water in the soil, the land dried out on top without the frost coming out. There was, as a consequence, very little mud, and the roads were dry early in April. April was milder than the average for the previous fifty years. It was not, however, as mild as the previous year. Ploughing was begun on the 17th of April and wheat was seeded on the 5th of May. The latter part of April and the first of May were, however, very unfavourable, and very little land was seeded before the 15th of May. From May 15 the weather was very favourable and the planting was finished earlier than usual. The early spring growth, especially on the pastures and hay land, was very slow, probably due to the drought of the previous summer. In the latter part of May and in the months of June, July and August, growing conditions were ideal, and the growth was very rapid. Pastures were exceptionally good. Hay was a bumper crop. Grain and all kinds of hoed crops, with the exception of potatoes, made excellent growth. Apples showed a good set of fruit, especially on the early and medium varieties. Small fruits were very good, excepting strawberries, which rotted owing to the wet weather.

The heavy rains in June, while ideal for the uplands, did considerable damage to crops on the low-lying land and intervales. All the intervales along the St. John were covered with water which destroyed the grain and hoed crops and left a deposit of sand and mud on the hay land. For this reason the hay was unpalatable and very difficult to cut. Owing to the wet weather in July and August, considerable hay was spoiled in the making, and potatoes blighted badly in some sections. Straw was heavy and, during August, it lodged badly and a large percentage of the grain was lost through shattering.

September was a fine month and an excellent crop of corn and sunflowers for silage was harvested, the corn being very well matured for this section. The apple crop was very good, especially the early and medium varieties, which produced a record yield. The first frost was on September 26, when four degrees was recorded. On October 21, thirteen and one-half degrees of frost was recorded, but the latter part of the month was mild. The root crop was harvested during the month. The yield was cut down by black rot and the crop was only fair.

Livestock were housed on the 11th of November, and were in fair condition as the pastures were good all summer. Winter conditions set in on the 21st of November. In December 36·5 inches of snow fell.

METEOROLOGICAL RECORDS AT FREDERICTON, N.B.

Month	Temperature F.			Precipitation			Bright Sunshine
	Mean	Highest	Lowest	Rainfall	Snowfall	Total	
	°	°	°	inch.	inch.	inch.	hours
January	11·34	37·0	−25	·15	16·0	1·75	132·20
February	14·20	46·0	−33	·18	28·0	2·98	123·20
March	29·9	54·0	−20	2·91	4·0	3·31	176·05
April	41·8	64·0	23·0	2·06	2·0	2·26	124·90
May	54·0	83·0	27·0	2·10	.....	2·10	222·60
June	65·75	89·5	43·0	4·61	.....	4·61	170·10
July	64·85	88·0	44·0	2·03	.....	2·03	216·90
August	64·30	86·0	43·5	5·74	.....	5·74	196·25
September	50·25	78·0	24·0	·52	.....	·52	198·15
October	45·46	78·0	18·5	2·06	.....	2·06	130·75
November	31·25	51·0	11·0	1·73	4·5	2·18	97·15
December	14·2	42·5	−28	·52	36·5	4·17	91·30
Totals	.....	.....	.....	24·61	91·0	33·71	1,879·55
Totals for five growing months	.....	.....	.....	.....	.....	15·00	1,004·00

ANIMAL HUSBANDRY

Excellent progress can be reported for this division during the year. The general health of the stock has been excellent. Tuberculosis appears to have been practically eradicated, no reactions having occurred since November 3, 1921. The work with cattle includes keeping records of (1) cost of milk production, (2) cost of producing baby beef, (3) cost of raising young stock. An experiment was carried on to compare corn and sunflower silage as succulent feed for growing heifers and a grading-up experiment was carried on with Ayrshire, Holstein and Shorthorn cattle.

No experimental work was attempted with horses, as the mature horses all worked during the winter months. Records were kept of cost of horse labour and cost of raising young horses.

The sheep were carefully culled during the summer and are now a very creditable lot. An early weaning versus late weaning experiment and a lamb feeding experiment were conducted during the year.

The flock of Angora goats maintained since 1917 has proven unprofitable and will be disposed of.

The herd of swine is small but of excellent quality. The work with them includes keeping record of (1) cost of keeping boars, aged sows and young sows for one year, (2) cost of raising litters of young pigs. An experiment was conducted to determine the value of barley as compared with corn for bacon production.

DAIRY CATTLE

The stock on December 31, 1922, totalled eighty-one head and included forty-six pure-bred and thirty-four grade cattle. Four of the grades are oxen and the remainder are kept for breeding and experimental work. The breeds of cattle and number of each breed are shown in the following table:—

Pure-bred Breeding Stock

Ayrshires—8 milch cows, 8 heifers, 2 bulls.
Holsteins—7 milch cows, 4 heifers, 2 bulls.
Shorthorns—6 milch cows, 8 heifers, 1 bull.

Grade Breeding Stock

Ayrshires—6 milch cows, 8 heifers, 1 steer.
Holsteins—2 milch cows, 5 heifers.
Shorthorn—2 milch cows, 6 heifers, 1 steer.
Working cattle—4 oxen.

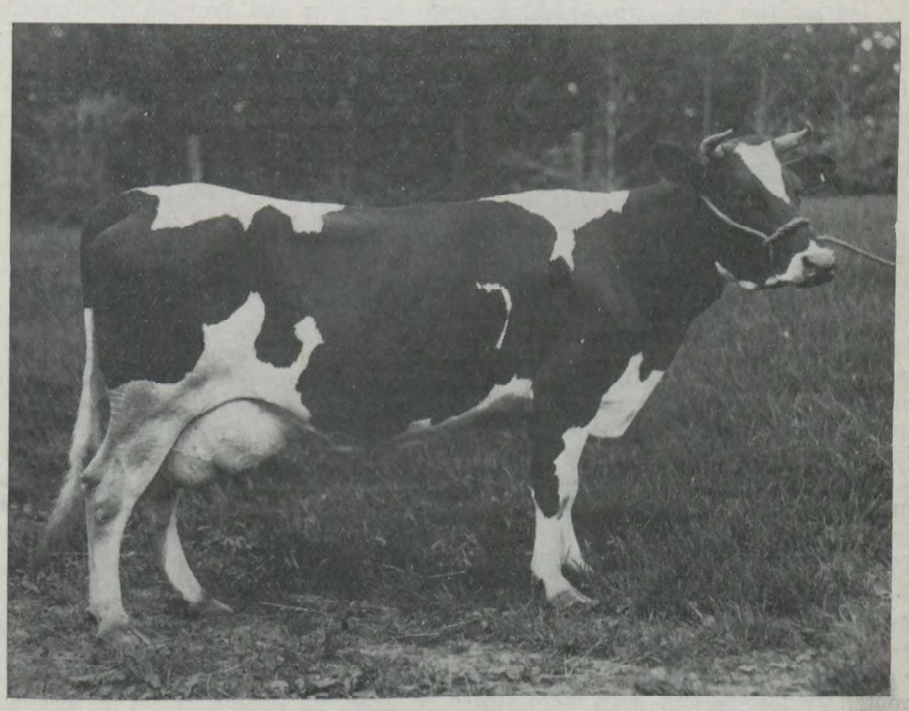
AYRSHIRES

The Ayrshires are all young. Only two cows have completed lactation periods. Six heifer calves and two bull calves were born during the year. The heifer calves were all kept in the herd, and the bull calves were all sold for breeding purposes.

The herd sire, Ravenwood Ivanhoe—72901, was obtained from the Charlottetown Station in April, 1920. He is a fine individual and his calves are very promising. His dam, Buttercup of Glenholm—56491, has a four-year-old record of 16,444 pounds of milk and 662 pounds of butter fat in one year.

HOLSTEINS

Four cows completed lactation periods during the year, and one of them, Rue Belle of Fredericton—67694, completed two lactation periods during the year. An excellent record was made by Helen Clover Ormsby—67693. She produced, under official test, 19,318 pounds of milk testing 3·5 per cent of fat, making a total of 676 pounds of fat in 365 days in her first lactation period.



No. 2. Helen Clover Ormsby, 67693.

Five females and a Holstein bull, purchased at F. R. Mallory's dispersion sale, have been added to the Holstein herd during the year. No females have been born in the herd since August, 1920.

The present herd sire, Johanna Beauty Boy—48966, was obtained from the Central Experimental Farm. His dam, Canaan Beauty—21172, has a 365-day record of 18,637 pounds of milk and 605·32 pounds of butter fat, as a three-year-old. This bull is an exceptionally well-grown senior yearling. He has, however, a drooping rump, and the calves got by him show the same defect.

SHORTHORNS

Only two shorthorn cows completed lactation periods during the year. The others are heifers and have not completed their first lactation period. These heifers were sired by the previous herd sire, Kentville Champion, and are very poor producers. They will be sold when the market for beef improves. One heifer calf, sired by Major Maude, was born. Three heifers were transferred from Kentville to this Station.

The present herd sire, Major Maude—116374, has been in the herd since July, 1921. He was born in May, 1917, and was bred by the Ontario Agricultural College. He is from heavy milking ancestors. His maternal granddam, Lady Maude—104585, has an official record of 11,891 pounds of milk. This bull is an exceptionally good type of milking Shorthorn, and his calves are very promising.

SALE OF BREEDING STOCK

During the year, two Ayrshire, seven Holstein and four Shorthorn bulls were disposed of for breeding purposes. The prices obtained for these bulls were low, considering the breeding and character of the stock. It is the policy of the Station, however, to sell whatever stock there is to dispose of, at a price that will be within the reach of any breeder. A number of other bulls were disposed of to the butcher as they were not considered good enough to offer for sale for breeding purposes.

METHOD OF FEEDING CATTLE

Summer months.—Owing to the wet weather the pastures were good. The pastures at this Station, though fairly extensive, are very sour, and the herbage, though abundant, lacks nutriment. Therefore, the cows on test were fed grain and either green feed or silage while on pasture, with the exception of six weeks in the summer. The main herd was fed from four to six pounds of grain, and from twenty to thirty pounds of either green feed or silage per head per day. The heifers and dry cows were on pasture five months, but during the last month at pasture they were fed some roots and hay. They were housed in the fall in rather poor condition. The value of silage to supplement summer pasture was again clearly demonstrated.

Winter months.—The cattle were wintered under good conditions. Rough feeds were abundant but, as only 16½ acres of oats were grown, it was necessary to buy a considerable quantity of straw for bedding. The hay was well harvested and the percentage of clover in the mixed hay was above average. The roots, sunflowers and corn were stored in excellent condition. The corn was exceptionally well matured for this section. There has been sufficient silage for

the winter requirements and a small quantity of O.P.V. silage will be left for summer feeding. The ration fed the milch cows per head per day was as follows:—

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

The meal mixture for cows in heavy milk consisted, for the most part, of equal parts of bran, crushed oats, brewers' grains and oil cake. The meal mixture for dry cows and those nearing the end of lactation periods consisted of, bran—two parts, screenings—one part, brewers' grains—one part, and oil cake—one part.

The meal was fed on top of the roots just after the morning milking. When this was eaten, hay was fed. At three o'clock in the afternoon the cows were given their ensilage and grain, and hay was given after the night milking. The cows were usually given all the roughage they would eat clean, and one pound of grain to each three or four pounds of milk. Water was before the cows at all times. Salt was added to the grain ration at time of mixing.

Yearling and two-year-old heifers not in milk are fed a ration of corn silage, roots and mixed hay or straw; but no meal until about two months before freshening. In order to have them freshen in good condition they are then fed from three to five pounds (depending on their condition), of the grain mixture fed to dry cows, until freshening. The junior and senior calves are fed a liberal ration, consisting of bran—one part, crushed oats—two parts, corn meal—two parts and oil cake—two parts, the aim being to get them well grown at an early age.

Unless otherwise stated, the following prices are charged for feeds for cattle:—

Hay	$10.00 per ton
Roots	5.00 "
Ensilage	5.00 "
Green Feed	4.00 "
Straw	5.00 "
Grain ration for first year	42.00 "
Grain ration from one year to date of calving	34.00 "
Grain ration for cows producing milk	40.00 "
Pasture	1.00 per month

The grain ration is charged at the prices paid during the year. The hay, roots, ensilage, green feed and straw are charged at the approximate values of these feeds in December, 1922, rather than the prices obtained for these feeds in the winter of 1921-22 when, owing to the drought of the previous summer, hay was worth from $25 to $30 per ton in the Fredericton market.

MILK PRODUCTION OF PURE-BRED COWS

The following are the milk records of all pure-bred cows and heifers that have finished lactation periods during the year ending December 31, 1922. There are a number of other cows and heifers that have started lactation periods but as they are not completed, they will be reported later. In the case of heifers with their first calf, the charges for feed start from date of freshening. In the case of cows with previous lactation periods, the charge for feed includes the periods during which they were dry before beginning the present lactation period.

MILK RECORDS—PURE-BRED HERD

Name of Animal	Breed	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 lb. milk	Cost to produce 1 lb. butter
							Meal at $40 per ton	Roots and ensilage at $5 per ton	Hay at $10 per ton	Green feed at $4 per ton	Months on pasture			
												$	$	$
Torchlight	A	340·0	7,347·0	21·6	4·8	354·32	2,974	9,200	1,858	620	4·8	97 81	1 33	0·276
Sapphire of Fredericton	A	360·5	7,188·5	18·3	3·9	328·48	5,090	12,959	3,150	.....	5·0	154 95	2 15	0·471
*Helen Clover Ormsby	H	365·0	19,318·0	52·9	3·5	794·3	7,102	14,642	2,761	4,798	3·8	205 85	1 06	0·259
Lee Keyes Korndyke	H	352·0	16,019·6	45·5	3·3	629·75	7,439	16,120	2,799	4,650	3·8	216 17	1 34	0·343
Rue Belle of Fredericton	H	353·0	8,778·4	24·8	3·1	322·16	4,727	12,622	3,228	.....	5·0	147 23	1 67	0·457
Rue Belle of Fredericton	H	287·0	9,392·1	32·6	3·4	376·62	3,847	9,975	1,750	3,570	3·8	121 57	1 29	0·322
Lily of Fredericton	S	289·0	5,119·9	17·7	4·4	265·53	3,344	11,760	1,922	775	4·8	112 24	2 19	0·422
Princess of Northlynd	S	227·0	4,917·8	21·7	3·3	195·27	2,606	8,870	1,920	620	2·8	87 93	1 78	0·450

*This is Helen Clover Ormsby's R.O.P. record. She milked 384·5 days and produced 19,580·4 pounds of 3·5 milk during her first lactation period.

COST OF PRODUCING BABY BEEF

Only one steer was fed during the year. He was a third-cross Shorthorn and weighed 635 pounds, live weight, at the age of 11 months and 1 day. He sold for 6½ cents per pound live weight. The cost of feed is shown in the following table.

—	Amount Fed	Price per Cwt.	Cost of Feed
	lbs.	$ cts.	$ cts.
New milk	266	2 00	5 32
Skim milk	3,083	0 20	6 16
Crushed oats	510	2 00	10 20
Bran	255	1 45	3 69
Oil cake	247	2 75	6 79
Corn meal	358	1 90	6 80
Roots and silage	1,695	0 25	4 23
Hay	934	0 50	4 67
Total cost of feed	.....	.....	47 86
Selling price of steer	.....	.....	41 27
Loss	.....	.....	6 59

COST OF REARING DAIRY HEIFERS

The records show the cost of rajsing dairy heifers to be as follows.

DAIRY HEIFERS—COST OF REARING

Period	Number of cows	New milk	Feed eaten in period			Hay	Straw	Pasture	Cost
			Skim-milk	Meal	Roots and silage				
		lb.	lb.	lb.	lb.	lb.	lb.	mos.	$ cts.
Ayrshires—									
To 1 year	5	627·2	3,487·6	1,331·3	3,057·4	877·4	.....	.....	59 50
To 2 years	6	.....	.....	1,149·5	7,188·6	1,344·5	.....	4·09	48 32
To calving at 2 years 7·5 months	2	.....	.....	390·5	3,845·0	638·5	.....	4·55	23 99
Average total	.....	.....	.....	.....	.....	.....	.....	.....	131 81
Holsteins—									
To 1 year	1	*1,280·0	2,966·0	1,285·0	4,546·0	926·0	.....	·23	74 74
To 2 years	4	.....	.....	1,061·7	7,183·2	1,246 0	.....	4·60	46·84
Average total	.....	.....	.....	.....	.....	.....	.....	.....	121 58
Shorthorns—									
To 1 year	4	633·0	3,622·5	1,373·7	3,475·0	904·2	.....	.....	61 96
To 2 years	8	.....	.....	1,068·7	6,710·0	1,291·8	43·7	4·37	45 86
To calving (8·66 months)	3	.....	.....	587·3	4,956·6	754·6	.....	4·73	30 54
Average total	.....	.....	.....	.....	.....	.....	.....	.....	138 36

*Heifer fitted for show, got extra new milk.

SUNFLOWERS VERSUS CORN FOR GROWING HEIFERS

In order to obtain data on the relative merits of corn silage versus sunflower silage as a succulent feed for growing heifers, one group of seven heifers was fed corn silage, and another group of seven heifers was fed sunflower silage. In addition to the silage, each group was given a daily allowance of 6 pounds of hay and 4 pounds of grain per animal. The result of the experiment follows.

—	Corn	Sunflowers
No. of days in experiment	28	28
No. of heifers in experiment	7	7
Gross weight April 22 lb.	6,710·0	5,993·0
Average weight, April 22 lb.	958·5	856·1
Gross weight, May 20 lb.	7,068·0	6,413·0
Average weight, May 20 lb.	1,009·7	916·1
Total gain for group lb.	358·0	420·0
Average gain for animal lb.	51·143	60·000
Average daily gain per group lb.	12·786	15·000
Average daily gain per animal lb.	1·826	2·143
Silage eaten by group per period lb.	980	980
Silage eaten per pound gain lb.	2·737	2·330

The heifers were fed in the same manner for another eight days. The last three days, however, they ran to pasture for several hours each day. On the 27th of May they were weighed before being turned out to pasture. The following table shows the shrinkage in each group after being on pasture three days.

—	Corn	Sunflowers
No. of animals in experiment	7	7
Gross weight on May 20 lb.	7,068·0	6,413·0
Average weight on May 20 lb.	1,009·7	916·1
Gross weight on May 27 lb.	6,868·0	6,138·0
Average weight on May 27 lb.	981·14	876·85
Loss per group from May 20 to 27 lb.	200·0	275·0
Loss per animal from May 20 to 27 lb.	28·57	39·28
Daily loss of animal lb.	3·571	4·91
Total gain per group over weight April 22 lb.	158·0	145·0
Gain per animal over weight of April 22 lb.	22·57	20·71
Total daily gain per group in 36-day period lb.	4·388	4·027
Daily gain per animal in period lb.	·626	·575
Pounds silage to produce 1 lb. gain from April 22 to May 27 labour and other feeds neglected lb.	7·974	8·690

Deductions

The larger gain made by the sunflower-fed group in the first period was largely due to the weight of the heavier feed in the intestines, as when the heifers were run for three days at pasture, the corn group showed larger gains for the whole period.

GRADING-UP EXPERIMENT WITH DAIRY CATTLE

This experiment was begun in 1914. Twenty-six cows of mixed breeding, typical of the cows on the average New Brunswick farm, were secured as foundation cows. These cows were bred to pure-bred Holstein, Dual Purpose Shorthorn and Ayrshire bulls. The object of the experiment was to compare, (1) milk production, (2) cost of milk production, (3) improvement in breed type, with their dams. The female progeny were kept for three lactation periods and records were kept of their milk production and cost of production during those periods, for the purpose of comparison with the average of the three lactation periods of the mature foundation cows. It was originally planned to carry on

the experiment for five generations, but losses from tuberculosis made this impossible. It was decided to carry on this experiment with only one breed this year.

Four families of Holstein grades which show considerable promise, and two first-cross Ayrshire cows, were kept to continue the experiment. All cows retained will be bred to a pure-bred Holstein bull. The Ayrshires were discarded because the work with them was not as far advanced as with the Holsteins. The Shorthorn grades are exceptionally poor producers and will be sold for beef when the market improves. There are seven 2nd-cross females, all daughters of Kentville Champion and one 3rd-cross senior heifer calf, the grand-daughter of Kentville Champion. This bull clearly illustrates the danger of using an unproven sire. His daughters, from both pure-bred and grade cows, are very inferior milk producers.

The results of the grading-up experiment are shown in the following table. In this table the foundation cows give their name to the family. The letters "A," "H" or "S" are used to indicate an Ayrshire, Holstein or Shorthorn grade, and the number of digits to indicate how many generations the cow is removed from the foundation cow. Thus "1-H" indicates a first-cross Holstein, "1-H-1," a second-cross Holstein and so on. The digit "1" indicates the dam's first-grade calf in that generation, "2" indicates the dam's second-grade calf in that generation and so on. Thus, Flecky 1A is Flecky's first calf by an Ayrshire sire, and Brownie 2-S is Brownie's second calf by a Shorthorn sire.

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Name of Animal	Age	Number days in lactation period	Total pounds of milk for period	Daily average yield of milk	Average per cent fat in milk	Pounds butter produced in period	Feed eaten in period					Cost of feed for period	Cost to produce 100 lb. milk	Cost to produce 1 lb. butter
							Meal at 2c. per lb.	Roots and ensilage at $5 per ton	Hay $10 per ton	Green feed at $4 per ton	Mos. on pasture at $1 per month			
												$	$	$
Flecky*	Mature	267·6	5,379·4	20·1	3·5	227·90	1,848·3	6,026	2,420	871	3·84	69 71	1 29	0·305
Flecky 1-A	2 years	212·5	6,151·3	33·6	3·6	278·92	3,780·0	8,610	2,370	.....	5·00	113 97	1 85	0·408
Julia*	Mature	301·6	6,098·4	20·2	3·9	278·20	2,218·0	9,924	3,928	1,181	4·16	95 33	1 56	0·342
Julia 1-A	2 years	339·0	5,056·5	14·9	4·2	249·55	3,533·0	11,856	2,964	.....	5·00	120 12	2 37	0·481
Julia 1-A	3 years	198·5	2,483·3	12·5	4·2	123·81	1,254·0	7,165	1,140	620	4·80	54 73	2 20	0·442
Blossom*	Mature	329·3	6,896·6	20·9	3·8	313·80	2,448·6	9,655	4,173	1,181	3·83	100 16	1 45	0·319
Blossom 1-A	2 years	222·0	4,755·9	21·4	4·3	242·76	2,790·0	7,246	1,820	.....	5·00	88 01	1 84	0·362
Blossom 1-A	3 years	221·5	4,325·3	19·5	4·1	179·62	2,061·0	13,060	2,532	620	4·80	92 57	2 14	0·515
Maggie*	Mature	294·0	6,099·7	20·7	3·9	286·30	2,599·0	8,376	3,650	956	2·33	95 41	1 56	0·333
Maggie 1-A	2 years	375·0	6,053·0	16·2	4·5	321·76	3,706·0	11,394	2,740	.....	5·00	121 30	2 00	0·377
Maggie 1-A	3 years	314·0	5,481·8	17·2	4·3	275·28	2,218·0	10,430	1,732	620	4·80	85 13	1 55	0·309
Kate*	Mature	277·3	6,013·3	21·6	3·9	281·60	2,305·0	6,703	3,075	1,290	4·00	84 81	1 41	0·301
Kate 1-A	2 years	380·5	5,998·0	15·7	4·9	347·55	3,604·0	10,650	2,420	.....	5·00	115 80	1 93	0·333
Kate 1-A	3 years	326·0	5,753·4	17·6	4·5	314·83	2,532·0	11,870	2,082	620	4·80	96 76	1 68	0·307
Tiny*	Mature	254·6	5,198·0	20·4	3·5	216·10	1,873·0	8,111	3,274	1,181	3·66	80 13	1 54	0·370
Tiny 1-A	2 years	360·0	6,123·5	17·0	4·2	303·63	3,648·0	10,495	2,430	.....	5·00	116 35	1 90	0·383
Tiny 1-A	3 years	287·0	4,679·4	16·3	4·0	219·43	2,362·0	11,240	1,970	620	4·80	91 23	1 94	0·415

*In the case of Flecky, Julia, Blossom, Maggie, Kate and Tiny the figures represent the average from three lactation periods.

Name of Animal	Age	Number days in lactation period	Total pounds of milk for period	Daily average yield of milk	Average per cent fat in milk	Pounds butter produced in period	Feed eaten in period					Cost of feed for period	Cost to produce 100 lb. milk	Cost to produce 1 lb. butter
							Meal at 2c. per lb.	Roots and ensilage at $5 per ton	Hay at $10 per ton	Green feed at $4 per ton	Mos. on pasture at $1 per month			
												$	$	$
Brindle*	Mature	300·3	5,632·3	18·7	4·5	305·50	2,049·6	8,485	3,488	1,181	4·00	86 01	1 52	0·281
Brindle 1-H	2 years	377·0	3,990·2	10·5	3·6	170·22	2,751·0	7,110	3,720	.....	4·00	95 39	2 39	0·560
Brindle 1-H	3 years	355·0	6,179·1	17·5	4·1	294·78	2,405·0	4,906	3,290	2,744	4·33	86 63	1 40	0·293
Brindle 1-H	4 years	364·0	10,209·7	28·0	3·8	461·73	4,956·0	14,862	3,450	.....	5·50	159 02	1 55	0·344
Brindle 1-H-1	2 years	102·0	4,175·2	40·9	3·8	173·01	1,300·0	4,110	1,194	.....	1·00	43 24	1 03	0·249
Bessie*	Mature	247·3	5,091·6	20·5	4·0	242·40	2,173·3	8,598	3,345	815	3·77	87 08	1 71	0·359
Bessie 1-H	2 years	342·0	3,645·5	10·7	3·9	165·59	1,922·0	4,059	3,475	2,744	4·59	76 04	2 08	0·459
Bessie 1-H	3 years	290·0	3,337·2	11·5	4·5	179·18	2,221·0	6,540	2,939	600	3·73	80 39	2 40	0·448
Bessie 1-H	4 years	232·0	4,580·3	19·7	3·9	204·27	3,286·0	7,995	2,652	.....	0·66	99 63	2 17	0·487
Bessie 1-H-1	2 years	162 0	4,406·3	27·2	3·6	188·70	2,105·0	5,642	894	.....	2·30	62 97	1 42	0·333
Brownie*	Mature	282·0	5,318·0	18·8	3·9	249·20	1,952 0	6,690	3,186	1,289	4·11	78 38	1 47	0·314
Brownie 1-H	2 years	350·0	7,816·5	22·3	3·2	295·81	2,938·0	6,825	3,625	.....	4·00	97 95	1 25	0·331
Brownie 1-H	3 years	366·0	5,497·8	15·0	3·6	229·21	1,833·0	5,712	2,892	2,444	4·33	74 62	1 35	0·325
Brownie 1-H	4 years	337·0	10,439·4	30·9	3·5	431·39	4,843·0	11,525	3,034	.....	5·00	145 84	1 39	0·338
Brownie 1-H-1	2 years	97·0	4,169·5	42·9	3·3	164·63	1,568·0	4,000	894	.....	1·00	46 83	1 12	0·284
Madge*	Mature	253·0	4,543·5	17·9	2·4	220·10	2,322·5	7,801	3,753	1,349	4·11	91 53	2 01	0 415
Madge 1-H	2 years	370·0	3,610·8	9·7	3·3	122·52	2,293·0	3,739	3,500	2,432	•6·60	84 17	2 33	0·686
Madge 1-H	3 years	287·0	4,193·6	14·6	3·2	158·17	2,136·0	6,085	3,358	915	1·94	78 49	1 87	0·496
Madge 1-H	4 years	335·0	5,902·2	17·6	3·4	235·72	3,831·0	9,425	2,693	.....	5·00	118 64	2 01	0·503
Tiny*	Mature	254·0	5,198·0	20·4	3·5	216·16	1,873·0	8,111	3,274	1,181	3·66	80 13	1 54	0·370
Tiny 1-H	2 years	322·0	4,074·0	12·6	3·4	165·36	1,823·0	4,315	3,165	.....	4·23	67 30	1 65	0·406
Tiny 1-H	3 years	289·0	3,528·9	12·3	3·6	148·17	2,071·0	6,325	2,508	600	3·10	74 07	2 09	0·499
Tiny 1-H	4 years	303·0	4,641·8	15·3	3·4	187·85	3,112·0	7,400	2,616	.....	3·75	97 57	2 10	0·519
Hannah*	Mature	235·0	5,518·0	23·4	3·8	247·3	1,921·3	8,260	3,422	990	3·73	81 89	1 48	0·331
Hannah 1-H	2 years	419·0	6,287·9	15·0	3·7	268·7	2,382·0	4,109	3,475	2,744	5·75	86 52	1 37	0·322
Hannah 1-H	3 years	301·0	4,234·4	14·0	3·6	180·7	2,153·0	6,505	3,394	600	5·19	82 68	1 95	0·457
Hannah 1-H	4 years	362·0	7,666·6	21·1	3·7	331·0	4,342·5	9,015	2,796	.....	5·48	128 85	1 68	0·389
Hannah 1-H-1	2 years	254·0	7,112·3	28·0	3·4	282·51	3,525·0	8,155	2,314	.....	5·00	107·40	1 51	0·380

*In the case of Brindle, Bessie, Brownie, Madge, Tiny and Hannah the figures represent the average from three lactation periods.
Brindle 1-H-1, Bessie 1-H-1, Brownie 1-H-1 and Hannah 1-H-1 reacted and were slaughtered before they completed their first lactation period.
Madge 1-H-1, and Tiny 1-H-1, reacted and were slaughtered before they freshened the first time.

Name of Animal	Age	Number days in lactation period	Total pounds of milk for period	Daily average yield of milk	Average per cent fat in milk	Pounds butter produced in period	Feed eaten in period					Cost of feed for period	Cost to produce 100 lb. milk	Cost to produce 1 lb. butter
							Meal at 2c. per lb.	Roots and ensilage at $5 per ton	Hay at $10 per ton	Green feed at $4 per ton	Mos. on pasture at $1 per month			
												$	$	$
Blossom*	Mature	329·0	6,896·6	18·8	3·8	313·80	2,448·6	9,655	4,172	1,181	3·83	100 16	1 45	0·319
Blossom 1-S	2 years	366·0	5,553·0	14·0	4·4	288·93	3,098·0	6,844	3,263	.....	4·00	90 95	1 50	0·371
Blossom 1-S	3 years	320·0	6,818·0	21·2	3·7	292·93	3,067·0	8,515	2,110	.....	5·00	98 17	1 43	0·335
Brindle*	Mature	300·3	5,632·2	18·8	4·6	305·50	2,049·6	8,485	3,488	1,181	4·00	86 01	1 52	0·281
Brindle 1-S	2 years	371·0	3,747·6	10·1	3·6	161·42	2,656·0	6,214	3,053	.....	4·00	87 92	2 34	0·544
Brindle 1-S	3 years	325·0	7,095·2	21·8	3·7	306·23	3,269 0	8,615	2,260	.....	5·00	103 21	1 45	0·337
Brindle 1-S	4 years	325·0	6,539·1	17·0	3·6	277·93	2,689·0	9,995	2,094	.....	5·00	94 23	1 44	0·339
Brindle 1-S-2	2 years	105·0	1,290·1	12·2	4·1	69·94	840·0	4,930	902	.....	.....	33 63	2 60	0·542
Brownie*	Mature	282·0	5,318·0	18·8	3·9	249·20	1,952·0	6,690	3,186	1,289	4·11	78 38	1 47	0·314
Brownie 1-S	2 years	384·0	4,693·9	12·2	4·4	242·69	2,888·0	6,280	2,798	.....	4·00	91 45	1 94	0·376
Brownie 1-S	3 years	292·0	5,191·9	17·7	4·2	248·12	2,671·0	7,145	1,720	.....	5·00	84 88	1 63	0·312
Brownie 1-S	4 years	334·0	5,586·7	16·7	4·0	263·75	2,860·0	10,900	2,364	.....	5·00	101 27	1 81	0·383
Brownie 2-S	2 years	388·0	6,125·5	15·8	4·8	292·30	3,496·0	8,430	2,370	.....	5·00	102 84	1 67	0·351
Maggie*	Mature	294·0	6,099·7	27·4	4·0	286·30	2,599·0	8,376	3,650	956	2·33	95 41	1 56	0·333
Maggie 1-S	2 years	359·0	3,790·3	10·5	4·2	187·76	2,940·0	6,194	2,943	.....	4·00	93 00	2 45	0·495
Maggie 1-S	3 years	282·0	5,433·9	19·3	3·9	247·27	2,891·0	8,205	2,040	.....	5·00	93 53	1 72	0·378
Maggie 1-S	4 years	271·0	4,616·5	17·0	3·9	211·54	3,363·0	10,165	2,364	.....	4·00	108 48	2 34	0·512
Muley*	Mature	425·6	9,095·7	21·3	4·4	479·72	3,208·6	10,145	4,813	2,171	4·69	122 63	1 23	0·255
Muley 1-S	2 years	329·0	2,831·9	8·6	4·1	137·55	2,116·0	4,795	2,252	.....	4·00	69 57	2 45	0·505
Muley 1-S	3 years	192·0	3,896·1	20·6	3·9	180·21	2,207·0	4,650	1,210	.....	4·50	56 31	1 44	0·312
Muley 1-S-1	2 years	153·5	1,962·6	12·8	4·5	103·69	1,344·0	5,685	1,130	.....	0·60	36 62	1 86	0·353
Queenie*	Mature	254·0	6,428·7	25·3	3·5	265·70	1,193·0	6,530	2,330	2,060	3·50	59 45	0 92	0·223
Queenie 1-S	2 years	384·0	7,545·1	19·6	3·7	336·50	2,922·0	6,214	3,053	.....	4·00	93 24	1 23	0·277
Queenie 1-S	3 years	232·0	5,932·2	25·6	3·8	269·04	2,525·0	5,760	1,210	.....	5·00	75 95	1 28	0·282
Sally*	Mature	263·0	5,363·0	20·2	4·1	261·90	1,735·0	7,159	3,220	981	3·83	74 49	1 38	0·284
Sally 1-S	2 years	388·0	7,062·3	18·2	3·8	323·06	2,967·0	6,214	3,053	.....	4·00	94 14	1 33	0·291
Sally 1-S	3 years	309·0	8,314·5	26·9	3·8	366·96	3,051·0	7,045	1,980	.....	5·00	93 53	1 12	0·254
Sally 1-S-1	2 years	361·0	4,539·4	12·8	4·1	220·00	2,460·0	9,828	1,828	.....	5·00	87 91	1 93	0·399
Sally 1-S-1	3 years	253·0	3,655·2	14·4	4·2	181·83	1,755·0	10,365	1,770	620	4·80	75 90	2 07	0·417
Shannon*	Mature	290·0	5,170·1	17·8	4·1	253·20	1,724·5	7,430	3,575	1,435	4·25	78 06	1 50	0·308
Shannon 1-S	2 years	395·0	5,553·0	14·0	4·4	288·93	3,098·0	6,844	3,263	.....	4·00	99 38	1 78	0·343
Shannon 1-S	3 years	207·0	5,424·3	26·2	4·1	266·34	2,129·0	4,830	1,000	.....	5·00	64 65	1 19	0·242

*In the case of Blossom, Brindle, Brownie, Maggie, Muley and Sally the figures represent the average from three lactation periods. In the case of Shannon the figures represent the average from two lactation periods, and in the case of Queenie the figures represent one lactation period.

Blossom 1-S, Muley 1-S, Queenie 1-S, Sally 1-S and Shannon 1-S reacted and were slaughtered in their second lactation period. Brindle 1-S, Brownie 1-S and Maggie 1-S completed three lactation periods.

Brindle 1-S-2, and Muley 1-S-1, were very poor producers and were disposed of in their first lactation period. Sally 1-S-1 failed to breed in her second lactation period and was disposed of for beef. The female progeny of the other cows, viz.: Blossom 1-S, Brownie 1-S, Brownie 2-S, Maggie 1-S, Queenie 1-S and Shannon 1-S were disposed of as heifers.

Deductions

I. The breed, type and conformation were greatly improved.

II. There was a slight increase in production over the foundation cows.

III. This increased production was obtained at a greater cost.

IV. The farmer using a pure-bred bull to improve a grade herd should use a proven bull with high producing ancestry, if possible.

HORSES

The horse stock on December 31, 1922, totalled seventeen head, consisting of one aged stallion, two mature mares, one three-year-old mare, one yearling mare, one yearling gelding, one horse foal and one filly foal, all pure-bred Clydesdales; also one grade Clydesdale mare, two grade Clydesdale geldings, one two-year-old grade Clydesdale mare, one grade Clydesdale filly foal, one grade Percheron mare, one grade Percheron gelding and two general-purpose mares sired by standard-bred sires.

The three foals reared during the year were sired by the Station stallion, Favourite Spencer, 20117. This horse has good conformation and quality but lacks size, and as the horses at the Station also lack size, no mares were bred this year.

The daily ration for the work horses varied from twelve to eighteen pounds of meal, according to the character of the work and the size of the horse. A mixture of four parts oats to one part bran was fed during the slack season, and five parts of oats to one part of bran was fed during the busy season. The hay allowance, which varied from twelve to sixteen pounds, was fed largely at night.

Accurate records were kept of the feed consumed, blacksmithing, cost of up-keep, and the number of hours' work performed by each horse and from these records the cost of horse labour per hour was compiled.

In making up the cost of horse labour the following charges were made:—

Timothy hay	$10.00 per ton
Bran	$29.00 per ton
Oats	0.68 per bushel
Roots (small carrots)	3.00 per ton
New shoes	3.50 per set
Changing shoes	2.00 per set

An additional charge of 1½ hours at twenty-five cents per hour was added to each horse for each trip to the blacksmith shop. This covered time lost by the teamsters when getting their horses shod. One-half hour per day at twenty-five cents per hour is charged against each working horse for up-keep. The costs are shown in the following table.

Cost of Horse Labour

Name	Sex	Date of birth	Feed eaten during year				Cost maintenance	No. of hrs. work	Cost per hr. labour	Weight of horses Jan. 1, 1923
			Bran	Oats	Hay	Roots				
			lb.	lb.	lb.	lb.	$ cts.		$	lb.
Favourite	M.	1917	1,090	4,169	5,475	136	194 75	2,369	0·082	1,350
Queen	F.	1913	1,097	4,189	5,475	136	192 88	2,439	0·079	1,350
Baron	M.	1916	1,107	4,261	5,475	136	197 08	2,386	0·082	1,535
Blaze	M.	1918	1,038	4,021	5,475	136	191 28	2,005	0·095	1,505
Grace	F.	1919	798	3,091	4,380	136	157 48	1,094	0·143	1,410
Jerry	M.	1915	729	3,065	3,907	136	141 28	1,959	0·072	1,300
Molly	F.	1914	660	2,710	3,907	136	131 81	1,829	0·072	1,340
Rose of Drumaston	F.	1915	984	3,591	5,475	136	171 03	1,319	0·129	1,500
Nancy	F.	1917	827	2,998	4,820	136	152 00	1,159	0·131	1,220
Rose of Dunure	F.	1917	1,025	4,008	5,475	136	190 08	1,771	0·107	1,340
Belle	F.	1906	917	3,463	5,475	96	191 69	1,226	0·156	1,200
Dot	F.	1912	922	3,485	4,380	118	183 01	1,364	0·134	1,110
Sultan	M.	1916	658	2,194	2,904	.....	122 51	634	0·193	1,050

Jerry and Molly were purchased in April and were only fed 260½ days. Rose of Drumanson, Nancy and Rose of Dunure raised foals during the year. Belle, Dot and Sultan are general-purpose horses and were used for driving and odd jobs. Nancy was sold on December 6 and Sultan was sold on August 30.

No allowance is made for cost or depreciation of animals or buildings.

FEED COST OF RAISING COLTS FROM BIRTH TO SIX MONTHS OF AGE

Name	Date of birth	Sex	Feed Eaten in Period				Cost of feed	Weight of colts at 6 months
			Bran	Oats	Hay	Roots		
			lbs.	lbs.	lbs.	lbs.	$ cts.	lbs.
Nell	June, 1920	F.	162	648	874	49	19 75	685
Gertie of Fredericton	April, 1921	F.	52	204	674	10	8·22	645
Rose Spencer	April, 1921	M.	43	173	602	10	7 11	595
Josie of Fredericton	April, 1922	F.	128	563	578	.....	16 00	625
Kitty	May, 1922	F.	169	773	874	27	22 32	665
Dunure of Fredericton	June, 1922	M.	172	826	966	28	23 89	605
Average	.....	.....	121	531	761	20	16 21	636

FEED COST OF RAISING HORSES FROM BIRTH TO ONE YEAR OF AGE

Name	Date of birth	Sex	Feed Eaten in Period				Cost of feed	Weight of colts at 1 year
			Bran	Oats	Hay	Roots		
			lbs.	lbs.	lbs.	lbs.	$ cts.	
Nell	June, 1920	F.	475	938	3,100	509	41 91	875
Gertie of Fredericton	April, 1921	F.	313	1,065	2,484	166	38 50	780
Rose Spencer	April, 1921	M.	301	1,033	2,404	166	37 29	760
Average	.....	.....	362	1,012	2,662	280	39 23	805

FEED COST OF RAISING HORSES FROM BIRTH TO TWO YEARS OF AGE

Name	Date of birth	Sex	Feed Eaten in Period					Cost of feed	Weight of horses at 2 years
			Bran	Oats	Hay	Roots	Pasture		
			lbs.	lbs.	lbs.	lbs.	mos.	$ cts.	lbs.
Nell	June, 1920	F.	916	2,351	5,582	711	5	94 28	1,305

The feed for the young horses was charged at the following prices:—

Hay	$10.00 per ton
Bran	29.00 per ton
Oats	0.68 per bushel
Roots (small carrots)	3.00 per ton
Pasture	1.00 per month

No allowance was made for labour or for cost or depreciation of buildings.

SHEEP

The flocks of Shropshires and Cheviots maintained at the Station are in excellent condition. The flocks were severely culled in the fall. All the pure-bred ewes that were aged, off type and poor breeders were disposed of. The grade Shropshire flock, with the exception of one spring lamb, was also disposed of. As a result the flocks are smaller than usual. They now number forty-three head, made up as follows:—

Shropshires—Breeding ewes, 17; spring lambs, 4; stock ram, 1.

Cheviots—Breeding ewes, 14; spring lambs, 5; stock ram, 1.

Grade Shropshires—Spring lamb, 1.

The Shropshire ewes are an exceptionally creditable lot. No purchases were made during the year. The imported ram, Nunnerley 39, 24081, was again used as a stock ram. He is a very fine individual, but his lambs, while of good conformation, have rather too much black wool.

The Cheviot ewes are only average. A Cheviot ram lamb, Springdale Lad 1, 1422, was purchased in the fall from A. T. Woodley, Knowlton, Quebec. He is of rather better type than the ewes and should improve the flock.

PASTURE

The sheep were sheared the first week in May, dipped May 17 and turned to pasture May 25. They were taken from regular pasture on September 30 and flushed on clover aftermath. The rams were put with the ewes on October 18. As a result of this flushing the breeding season was short. All the sheep were housed in excellent condition on November 21. It is planned to winter them on a ration of mixed hay and turnips. No grain will be given until two weeks before the lambing season commences.

LAMBS

The lambing season started on February 13. Owing to the poor condition of the ewes the previous fall, there was a very small percentage of twin lambs and the lambing season lasted three months. Twenty-one Shropshire ewes and two Shropshire yearlings produced twenty-eight lambs, fourteen of which were rams. Fifteen Cheviot ewes and one Cheviot yearling produced twenty-two lambs, eleven of which were rams. Three Shropshire grade ewes produced five lambs. Part of the lambs were weaned July 15 and the remainder on August 14. The early weaned lambs did best. This was probably due to their being freer from intestinal parasites.

BREEDING STOCK

As it is the policy of this Station to sell only good breeding stock, only six Shropshire and five Cheviot ram lambs were kept as breeders. The others were castrated. The best of the ewe lambs were kept in the flock and the culls were sold to a local butcher. The improved price for wool and lamb was reflected in the demand for Shropshire ram lambs. The Station could not supply half the demand. There was only one inquiry for Cheviot ram lambs during the year. This breed is not popular with the New Brunswick farmers. While they are very hardy, they are wild and difficult to handle. Their lambs are not as heavy as the Shropshires and their wool crop averages lower in both weight and grade. It is doubtful whether they will ever become popular in this province.

WOOL

Owing to the severe drought of the previous summer, the wool clip was lighter than usual. The Shropshires sheared 6·5 pounds per sheep, all of which was medium combing and brought twenty-six cents per pound. The Cheviots sheared 5·7 pounds per sheep. Eight of the fleeces graded medium combing, thirteen low combing and one seedy. The medium combing brought twenty-six cents per pound, the low medium combing twenty-two cents, and the seedy eleven cents per pound. These figures show clearly the superiority of the Shropshire over the Cheviot on a graded wool basis.

EARLY VERSUS LATE WEANING OF LAMBS

During the summer of 1922, an experiment was carried on to test the merits of early weaning as compared with late weaning. One lot, consisting of ten Cheviots and eight Shropshires, was weaned on July 15 and put on rape with access to pasture. The other lot, consisting of ten Cheviots and seven Shropshires, was left with their dams until August 14. The lambs were weighed at the beginning and end of the period, and the results obtained are shown in the following table.

EARLY VS. LATE WEANING OF LAMBS

——		Lot I. — Weaned and put on rape July 15	Lot II. — Left to pasture with dam
Number of days in experiment		30·0	30·0
Number of lambs in experiment		18·0	17·0
Gross weight of groups, July 15	lb.	975·5	911·5
Average weight of lambs, July 15	lb.	54·19	53·62
Gross weight of group, Aug. 14	lb.	1,195·0	1,034·0
Average weight lambs, Aug. 14	lb.	66·39	60·82
Total gain per group for period	lb.	220·0	122·5
Average gain per lamb for period	lb.	12·22	7·21
Daily gain per group for period	lb.	7·33	4·08
Average gain per lamb for period	lb.	0·407	0·240

On August 14, all the lambs were weaned and the ram lambs were removed from both the early and the late weaned lambs. (These ram lambs were put with the stock rams on clover aftermath and given a grain ration of one-half pound each per day.) The remaining lambs in both lots were put on rape with access to pasture. The early weaned lots consisted of six Cheviots and four Shropshires and the late weaned lot consisted of seven Cheviots and six Shropshires. The results are shown in the following table:—

EARLY VERSUS LATE WEANING OF LAMBS

		Lot I. — Weaned and put on rape, July 15	Lot II. — Left at pasture with dam until Aug. 14
Lambs in experiment		10	13
Total days in experiment—1st period		30	30
Gross weight of group, July 15	lb.	482·5	691·0
Average weight of lambs, July 15	"	48·25	53·15
Gross weight of group, Aug. 14	"	579·0	787·0
Average weight of lambs, Aug. 14	"	57·90	60·54
Total gain per group—1st period	"	96·5	96·0
Average daily gain per animal—1st period	"	9·65	7·38
Daily gain per group	lb.	3·216	3·200
Average gain per animal	"	·321	·246
Number of days in experiment—2nd period		31	31
Gross weight of group, Sept. 14	lb.	710·5	882·5
Average weight of lambs, Sept. 14	"	71·05	67·88
Total gain per group, 2nd period	"	131·5	95·5
Average gain per animal, 2nd period	"	13·15	7·34
Daily gain per group, 2nd period	"	4·24	3·08
Average daily gain per animal, 2nd period	"	·424	·237
Number of days in both periods		61	61
Total gains for group, both periods	lb.	228·0	191·5
Average gain per lamb, both periods	"	22·8	14·73
Daily gain per group, both periods	"	3·737	3·139
Average daily gain per lamb, both periods	"	·373	·241

Deductions:—

I. Early weaned lambs put on rape will make better gains than unweaned lambs left with dams, on the average New Brunswick pasture.

II. The early weaned lambs will continue to make larger gains than the later weaned lambs in the period after the later weaned lambs are taken from their dams.

III. It is possible to wean lambs early by using rape and pasture without the addition of grain.

The much superior gains made by the early weaned lambs at this Station may be partly due to the late weaned lambs becoming infected with internal parasites. It is also possible that the late weaned lambs received a check on the rather poor pasture in August previous to weaning. When full allowance was made, however, the difference in favour of the early weaned lambs was very noticeable and, besides, the dams of the early weaned lambs were in much better shape to breed in the fall.

LAMB FATTENING EXPERIMENT

An experiment was conducted last fall to ascertain whether a profit could be made fitting lambs for market under New Brunswick conditions. The practice prevailing in New Brunswick of selling all the lambs in the fall usually breaks the market. As a result, the farmer has to sell his lambs at a loss. This glutting of the market would be prevented if part of the lambs were held over until Christmas. It was felt, however, that the Station could not advise farmers to hold their lambs, until it had obtained data on the profit accruing from so doing. On November 1, twelve rather nondescript lambs of mixed breeding were purchased at 6¾ cents per pound, live weight. These lambs were fattened

at the Station on hay, turnips and grain. On January 4 they were sold to a local butcher for nine cents per pound, live weight. The results are shown in the following table:—

LAMB FATTENING EXPERIMENT

Number of lambs in experiment		12
Number of days in experiment		64
Initial gross weight of lambs	lb.	846·0
Initial average weight of lambs	"	70·5
Finished gross weight of lambs	"	921·0
Finished average weight of lambs	"	76·75
Total gain for group in period	"	75·00
Average gain for animal in period	"	6·25
Average daily gain for group in period	"	1·17
Average daily gain for animal in period	"	·098
360 lb. corn meal at $1.90 per cwt	$	6·84
180 lb. crushed oats at $2 per cwt	$	3·60
25 lb. oil cake at $2.75 per cwt	$	0·68
1,920 lb. turnips at 25 cents per cwt	$	4·80
792 lb. hay at 50 cents per cwt	$	3·96
Total cost of feed for period	$	19·88
Initial cost of lambs, 846 lb. at 6¾c. per lb	$	57·10
Selling price of lambs, 921 lb. at 9c. per lb	$	82·89
Profit on lambs, labour and manure neglected	$	5·91

Deductions:—

While only one year's results are available, it would seem that lambs can be finished for the Christmas market at a profit. The lambs were infected with internal parasites which probably accounts for the small gains. This experiment will be repeated next year with a carload of lambs chosen from flocks that are apparently free from intestinal parasites.

ANGORA GOATS

In order to obtain accurate data on the feasibility of using goats to clear New Brunswick bush land, ten does and one buck were purchased in 1918. The kidding season began before the goats became properly acclimatized and as a result four does and all the kids, with one exception, died. As there were not sufficient goats to carry on a practical experiment, they were turned out each summer in an eighty-four acre bush pasture until 1921, when twenty-one goats and thirteen kids were confined on a three and a half acre area of bush land, mostly poplar, birch and alder. The goats killed the poplar, stripped all the leaves off the birch and partly stripped the leaves off the alders. The results are shown in the following table:—

ANGORA GOATS—BUSH CLEARING EXPERIMENT

Number of goats in experiment		34
Per cent poplar killed		100
Per cent alder killed		None
Per cent birch killed		50
Average height of bushes	ft.	4–8
Length of winter feeding period	days	203
Feed eaten in period—		
8,374 lb. hay at 50c. per cwt	$	41 87
3,350 lb. oats at $2 per cwt	$	67 00
12,180 lb. turnips at 25c. per cwt	$	30 45
Total cost of feed	$	139 32
90 lb. mohair at 8c. per lb	$	7 20
Cost of partly killing bushes on 3½ acres of land, labour neglected	$	132 12
Cost of partly killing bushes on 1 acre of land, labour neglected	$	37 75
Cost of cutting and piling bushes on similar land	$	6 00

The feeding, which took one-half hour each day, is balanced against the manure. The price allowed for the mohair is the actual price paid the Station by the Co-operative Wool Growers, no allowance being made for cost of shear-

ing, baling and transporting to their warehouse. If the price paid by the Co-operative Wool Growers, namely, eight cents per pound, is any criterion, the mohair produced in New Brunswick is practically worthless.

On May 22, twenty-seven adult goats and kids were put on two acres of young poplar, birch and alder which were from six to nine feet in height. The bushes were so high that the goats made very little impression on them up to June 15, when they were moved to six acres of similar bushes which were from two to four feet high. The goats partly destroyed the bushes on this lot by fall.

Deductions

I. Goats have a discriminating taste. While they may be depended upon to partly destroy poplar, birch and maple, they avoid alder bushes.

II. They are not practical for clearing land which is covered with heavy bush, although they would possibly prevent land from growing up in bushes.

III. They cannot clear New Brunswick land economically. This is partly due to the long supplementary feeding season, which makes the cost of keeping them prohibitive.

IV. New Brunswick mohair is low grade and the revenue from it is negligible.

PALATABILITY OF GOAT FLESH

The following experiment was conducted to ascertain if the local prejudice against goat flesh was justified. Two goats were slaughtered and their flesh distributed among the people at the Station. They were asked to give an unbiased report on the palatability of the flesh. One goat, which was slaughtered when the goats were on the bush pasture, resembled venison but was so tough as to be uneatable. The other goat, which was stall fed for two months previous to being slaughtered, resembled low-grade mutton.

Deductions

I. Goat flesh is not palatable enough to command a profitable market.

There have been a number of inquiries from farmers who wished to purchase goats for clearing land, but as the Station could not recommend them as an economical means they were sold to a drover on the 5th of March.

SWINE

Pure-bred Yorkshires only are kept at this Station. The breeding stock on December 31, 1921, consisted of one aged boar, three aged sows and two young sows. The herd sire Gramandyne Gold Link 73396, bred by A. Dynes, Ottawa, although rather compact, is a very good bacon type. The Station sows are of good length, however, and this fault does not appear in his offspring. The aged sows No. 5 and the young sows Nos. 12 and 13 were sold to a drover on the 27th of July. The young sows from No. 9 spring litter were kept to replace them. A number of young sows and boars were sold for breeding purposes. The remainder were kept for a feeding experiment.

Careful records were kept of the feed consumed during the year. The grains composing the meal mixture were charged at cost prices. Mangels were charged at five dollars per ton. Cull potatoes were charged at fifty cents per barrel, twenty-five cents being for the potatoes and the other twenty-five for the labour and wood used in cooking. No additional charge was made for the labour feeding, as the value of the manure would offset this charge. No allow-

ance was made for the four months on pasture or for the depreciation of buildings, as the hogs were not housed during the summer months, but during the winter they were housed in portable cabins, the initial cost of which was less than seven dollars.

AVERAGE COST OF MAINTAINING SOW DURING GESTATION PERIOD

The five sows which produced spring litters consumed on an average the following feed during gestation period:—

258 lb. of screenings at $1.20 per cwt.	$ 3.10
176 lb. of bran at $1.45 per cwt.	2.55
960 lb. of potatoes at $0.50 per brl. (165 lb.)	2.91
933 lb. of mangels at $0.25 per cwt.	2.33
Total cost of feed for period	10.89
Cost of boar service	2 00
Total	$ 12.89

FARROWING RECORD

Herd number of sow	Date of birth	Date of farrowing	Number of pigs	Male	Female	Number reared
12	April 22, 1921	April 5, 1922	4			
5	May 5, 1917	May 3, 1922	9	5	4	8
8	April 1, 1920	April 17, 1922	6	4	2	6
9	April 1, 1920	May 11, 1922	10	5	5	10
13	April 22, 1921	June 1, 1922	8	5	3	8
8	April 1, 1920	Sept. 21, 1922	9	4	5	9
9	April 1, 1920	Oct. 17, 1922	10	3	7	10

Average number of young pigs per spring litter	7·4
Average number of pigs raised per spring litter	6·4
Average number of young pigs per fall litter	9·5
Average number of pigs raised per fall litter	9·5
Average cost of young pig in spring litter	$ 1.74
Average cost of young pig raised from spring litter	$ 2.01

*Sow No. 12 was injured and farrowed prematurely.

COST OF RAISING LITTERS TO SIX WEEKS

Cost to birth	$ 12.89
120 lbs. bran at $1.45 per cwt.	1.74
240 lbs. middlings at $1.70 per cwt.	4.08
180 lbs. crushed oats at $2 per cwt.	3.60
Total cost of litter to six weeks	22.31
Average number of pigs per litter raised to six weeks	6.4
Average cost per pig to six weeks of age	3.49

COST OF RAISING YOUNG SOWS TO DATE OF FARROWING

Approximate age at farrowing	11 months
Average cost to six weeks of age	3.49
1,644 lbs. skim-milk at 20 c. per cwt.	3.29
209 lbs. crushed oats at $2 per cwt.	4.18
209 lbs. middlings at $1.70 per cwt.	3 55
125 lbs. shorts at $1.45 per cwt.	1.81
63 lbs. bran at $1.45 per cwt.	0.91
1,650 lbs. potatoes at 50c. per brl. (165 lbs.)	8.25
Total cost	25.48

COST OF MAINTAINING AGED SOW FOR ONE YEAR

Buckwheat, 14 lb. at $1.50 per cwt.	$ 0.21
Crushed oats, 76 lb. at $2 per cwt.	1.52
Middlings, 169 lbs. at $1.70 per cwt.	2.87
Screenings, 709 lbs. at $1.20 per cwt.	8.51
Bran, 792 lbs. at $1.45 per cwt.	11.48
Mangels, 340 lbs. at 25c. per cwt.	0·85
Potatoes, 3,300 lbs. at 50c. per barrel of 165 lbs.	10.00
Total cost	$ 35.44

These sows were at pasture four months.

COST OF MAINTAINING BOAR FOR ONE YEAR

The aged boar at the Station was on pasture four months during the year. The remainder of the year he was kept on a maintenance ration. Costs are shown in the following table:—

Oats, 14 lbs. at $2 per cwt.	$ 0.28
Middlings, 108 lbs. at $1.70 per cwt.	1.84
Screenings, 626 lbs. at $1.20 per cwt.	7 51
Bran, 638 lbs. at $1.45 per cwt.	9.25
Mangels, 196 lbs. at $0.25 per cwt.	0.49
Potatoes, 3,548 lbs. at $0.50 per brl. of 165 lbs.	10.75
	$ 30.12

FEEDING HOGS FOR BACON PRODUCTION

CORN VERSUS BARLEY

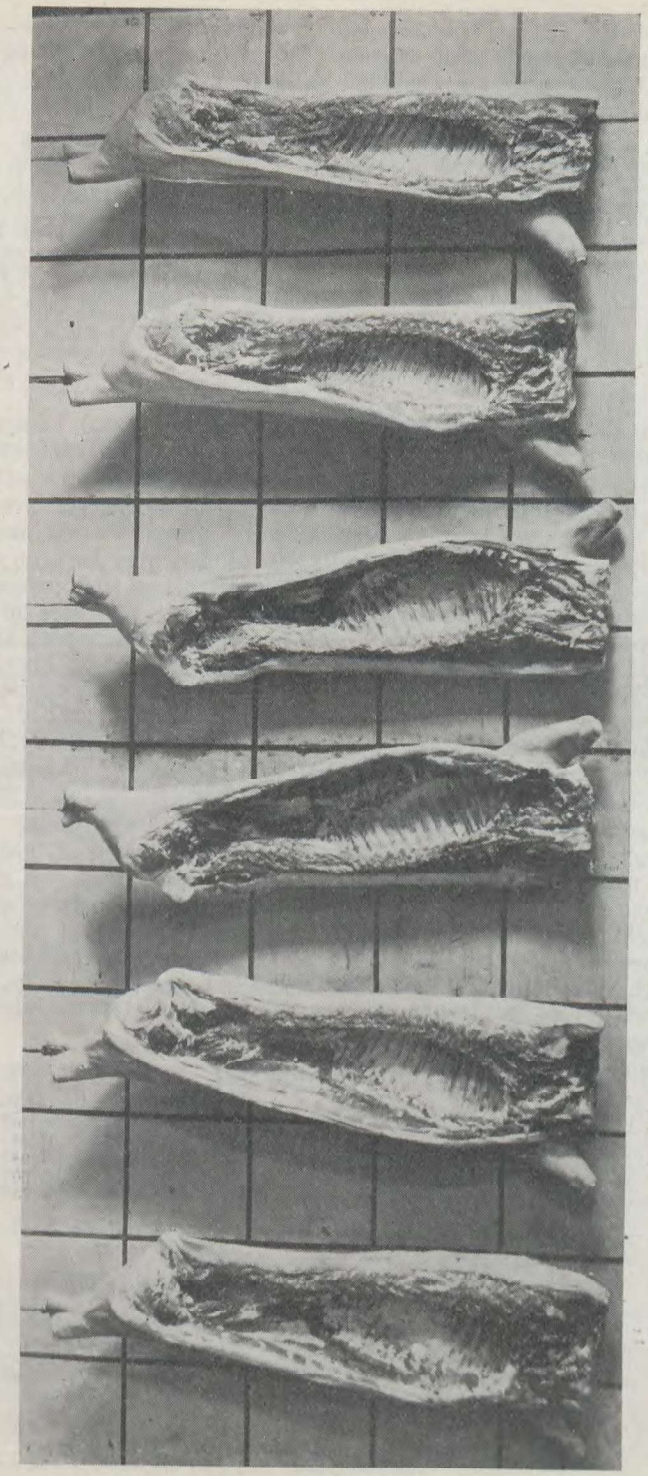
In order to determine how barley (a home-grown grain) compared with corn (an imported product) in finishing bacon hogs for the British market the following experiment was carried on at this Station in the summer of 1922.

Fourteen pigs were divided into four lots. Lots I and III were finished with corn, and lots II and IV were finished with barley. Lots I and II, consisting of three pigs each, were from two litters. Three were born on the 3rd of May and three on May 11. Lots III and IV, consisting of four pigs each, were from one litter and were born on the 1st of June. All the pigs were left with the sows until six weeks of age. They were then fed in accordance with the plan as outlined below. (On July 21 one of the pigs in lot II died). The hogs were slaughtered on November 18 and graded on November 20. An expert from the Wm. Davis Company superintended the slaughtering and graded the hogs. They all qualified for the premium. The corn-fed pigs were slightly larger, but the bacon from the barley-fed pigs was decidedly firmer and of better quality.

The plan of feeding was as follows. Lots I and III were fed, from six to ten weeks of age, oats and middlings in equal parts, with skin milk. From ten to fourteen weeks of age they were fed a mixture consisting of, oats 2 parts, shorts 1 part, middlings 1 part, corn 1 part, with skim milk and green feed. From fourteen to twenty weeks of age they were fed equal parts of oats, shorts and corn with skim milk and green feed. From twenty weeks of age to date of slaughtering they were fed a mixture consisting of corn 2 parts, shorts 1 part, oats 1 part with skim milk and green feed. Lots II and IV were fed the same except that barley took the place of corn. From the 21st of July the hogs were fed tankage in self feeders.

The following prices were charged for feed:—

Oats	$2.00	per cwt.
Middlings	1.70	"
Shorts	$1.45	"
Corn	1.95	"
Barley	1.60	"
Tankage	2.75	"



Wiltshire sides produced at the Fredericton Station—Corn vs. barley—Hog Feeding Experiment.

—	Lot I, Corn	Lot II, Barley	Lot III, Corn	Lot IV Barley
Number of pigs in experiment	3	2	4	4
Gross weight, July 12.....lb.	87	55	102	99
Average weight July 12.....lb.	29·00	27·50	25·50	24·75
Gross weight Nov. 18.....lb.	655·0	440·0	750·0	705·0
Average weight Nov. 18.....lb.	218·3	220·0	187·5	176·2
Total gain per group.....lb.	568·0	385·0	648·0	606·0
Average gain per animal.....lb.	189·3	192·5	162·0	151·5
Total dressed weight.....lb.	503·0	327·0	548·0	511·0
Dressing percentage.....lb.	76·79	74·31	73·07	72·48
Meal eaten by group 1st period.....lb.	48·3	32·2	54·5	54·5
Meal eaten by group 2nd period.....lb.	174·0	126·0	285·0	280·0
Meal eaten by group 3rd period.....lb.	255·0	202·0	396·0	414·0
Meal eaten by group 4th period.....lb.	1,100·0	740·0	732·0	669·0
Total meal eaten.....lb.	1,577·3	1,100·2	1,467·5	1,417·5
Skim-milk fed group.....lb.	3,253·0	2,163·5	4,389·5	4,389·5
Tankage fed group.....lb.	110·0	85·0	120·0	115·0
Meal fed per lb. gain.....lb.	2·77	2·85	2·26	2·33
Cost of feed per group, green feed neglected.....lb.	38·393	25·165	38·851	35·939
Cost of pigs at $5 each..... $	15·00	10·00	20·00	20·00
Total cost of pigs and feed, green feed neglected... $	53·393	35·165	58·851	55·939
Cost of pork per cwt. labour and green feed neglected $	10·61	10.75	10.73	10.94
Cost of feed per head, green feed neglected..... $	12.797	12.582	9.712	8.934
Cost of feed to produce 1 lb. gain green feed neglected..... $	6.759	6.536	5.995	5.930

GRADING

After slaughtering, these hogs were cooled for forty-eight hours. They were then graded by Mr. Stafford, Plant Superintendent, of the William Davis Company, Montreal. As the hogs were eventually to be sold on the local market, they were not all cut into Wiltshire sides, but a Wiltshire side was cut from a corn fed and a barley fed hog representative of each class, namely, prime, lean and leanest. Grading results are shown in the following table:—

Lot No.	Number of hog	Fattening ration	Age in days	Grading	Dressed weight	Weight of Wiltshire side
					lbs.	lbs.
I.	1	Corn	200	Prime	176	72
I.	2	Corn	192	Lean	165	.....
I.	3	Corn	192	Lean	162	62
II.	1	Barley	200	Prime	172	69
II.	2	Barley	192	Lean	155	61
III.	1	Corn	171	Lean	154	.....
III.	2	Corn	171	Lean	140	.....
III.	3	Corn	171	Lean	129	.....
III.	4	Corn	171	Leanest	125	51
IV.	1	Barley	171	Lean	143	.....
IV.	2	Barley	171	Leanest	130	52
IV.	3	Barley	171	Leanest	124	.....
IV.	4	Barley	171	Leanest	114	.....

Deductions:—

I. Barley can be used to replace corn in a fattening ration.

II. Barley has not as great a feeding value, pound for pound, as corn.

III. Hogs finish a little more slowly on barley than on corn.

IV. In the judgment of an expert, barley-fed hogs have a decidedly better finish than corn-fed hogs.

A second experiment, with eight uniform pigs from one litter, is being carried on under winter conditions. This experiment will be carried on again next summer and buckwheat will be included as it is very generally used by the farmers of New Brunswick for feeding hogs.

FIELD HUSBANDRY

THE SEASON

The field crops were good, but the wet season made weeding, thinning and cultivating very expensive. In many cases, the cost was one hundred per cent more than it would be in a normal year.

ROTATION

The four-year rotation carried on since 1921 is much more satisfactory than the three-year rotation followed prior to that time. With the former three-year rotation, which consisted of: first year, hoed crop; second year, grain; third year, hay, two-thirds of the land was put in crop each spring. This made the spring work very heavy and too great an area was devoted to root and ensilage crops as compared with hay. This necessitated the purchase each year of large quantities of the latter. In the present four-year rotation, consisting of: first year, hoed crop; second year, grain; third year, clover hay; fourth year, mixed hay, the proportion of hay and of root and ensilage crops is much more satisfactory. This rotation has a weakness, however, in that the proportion of grain is too small. Thus, while there is sufficient hay, roots and ensilage for stock requirements, considerable quantities of oats and straw must be purchased. In order to get reliable data on rotations suitable for New Brunswick, a comprehensive experiment on rotations will be started in the spring.

COST OF MANURE AND FERTILIZER

In the tables showing cost of raising the different crops, the commercial fertilizer, which was home-mixed, is charged at cost price of the chemicals plus one dollar per ton to cover cost of mixing. The ground limestone is charged at cost price, namely, five dollars a ton. Partly rotted barnyard manure, made when straw was used as bedding, is charged at one dollar per ton, and when shavings were used as bedding it is charged at fifty cents per ton. When commercial fertilizer was used, either wholly or in part, to replace barnyard manure, the cost of production was much higher than when manure was used alone.

The field husbandry work for the season included: (1) raising and keeping records of cost of production of hay, grain, silage and root crops, and (2) the inauguration of an experiment to determine the yield per acre and cost per ton of succulent feed from different crops, when grown under similar conditions.

HAY

The abundant rain during the growing season of 1922 was very favourable to the growth of hay on the uplands. The hay, which was stored in excellent condition, had a much larger percentage of clover in it than usual. The total hay cut in 1922 was 161 tons 586 pounds. Of the first cutting, which totalled 151 tons and 412 pounds, 100 tons 1,000 pounds was cut on fifty-four acres of rotation land which yielded at the rate of 1 ton 1,722 pounds per acre. The remainder of the first cutting was from forage plots, road sides and permanent meadows. The second cutting totalled 9 tons 1,269 pounds, of which 8 tons 1,765 pounds was cut on ten acres of rotation land and 1,504 pounds was cut on the alfalfa plots. The alfalfa plots were cut a third time and yielded 905 pounds.

COST OF PRODUCING HAY

The hay on the rotation land was made in July. Conditions were excellent during the latter part of the month, and the hay was made without much weathering.

The cost per acre of making hay on the rotation land was as follows:—

Rent of land at $3 per acre	$ 3.00
Manure, ¼ of 15 tons at $1 per ton	3.00
Seed, ½ of 10 lbs. clover and 6 lbs. timothy	1.67
Mowing, 1 hour at 50c. per hour	0.50
Raking, 2 horses, 4 hours at 50c. per hour	0.20
Raking, 1 horse, 1 hour at 32c. per hour	.32
Coiling, loading and unloading, 8·4 hours at 25c	2.10
Hauling in, 2·2 hours at 50c. per hour	1.10
Use of machinery $1 per acre	1.00
Total cost per acre	$ 12.89
Yield per acre, 1 ton 1,722 pounds. Cost per ton	$ 6.92

OATS

Owing to the change from a three-year to a four-year rotation only 16½ acres were sown to oats. This land had been in hoed crop the previous year. As winter set in before the land was all ploughed, part of the field was spring ploughed. A good seed bed was prepared with the disc and smoothing harrows on May 15 and the land was seeded to Banner oats on May 16, at the rate of three bushels per acre. The oats were ripe on August 21, but, owing to wet weather, they were not cut until the 31st of August. As the straw was heavy and lodged badly, it could not be bound into sheaves. Part of it was cut by hand and part of it with a reaper. The weather was very fine during the harvesting, and the losses from shattering were small considering the over-ripe condition of the grain. The total yield was 26 tons 866 pounds of straw and 825 bushels of grain.

The cost of production per acre was as follows:—

Rent of land at $3 per acre	$ 3.00
Manure, ¼ of 15 tons at $1 per ton	5.00
Seed, 3 bushels at $1.25 per bushel	3.75
Ploughing with gang plough, 4·5 hours at 50c	2.25
Discing and harrowing, 3·33 hours at 50c	1.66
Seeding, 1 hour at 50c	0.50
Reaping, 1·2 hours at 50c. per hour	0·60
Hand mowing 2 hours at 25c	0.50
Hauling in, 2·7 hours at 50c	1.35
Loading and unloading at thresher, 5·9 hours at 25c	1.47
Threshing 50 bushels at 8c. per bushel	4.00
Use of machinery at $1 per acre	1.00
Total cost per acre	$ 25.08
Yield of grain per acre, 50 bushels.	
Credit straw, 1 ton 505 pounds at $6 a ton	$ 7.52
Cost of grain per acre	17.56
Cost per bushel	0·3512

Liberty Oats.—One-fourth of an acre of fall ploughed sod was sown with Liberty oats. The ground was given an application of barnyard manure at the rate of fifteen tons per acre. The yield of straw was 1,106 pounds, and the yield of grain was 244 pounds.

SPRING WHEAT

The spring wheat was grown on 1·86 acres of spring ploughed land which had been in hoed crop the previous year. The wheat was sown on May 5. It was cut on the 22nd of August and threshed on the field on August 23. The total yield of straw was 3 tons and 20 pounds, and the total yield of wheat was 52½ bushels.

The cost of production per acre was as follows:—

Rent of land at $3 per acre	$ 3.00
Manure, ¼ of 15 tons at $1 per ton	5.00
Seed, 2 bushels at $2	4.00
Ploughing, 10·7 hours at 50c	5·35
Tractor harrowing, 3·2 hours at 85c	2.72
Seeding, 2·7 hours at 50c	1.35
Rolling, ·5 hours at 50c	0.25
Binding, 1·6 hours at 50c	0.80
Stooking, 2·1 hours at 25c	0.52
Hauling in, 3·2 hours at 50c	1·60
Loading and unloading, 4·8 hours at 25c	1.20
Threshing, at 8c. per bushel	2.25
Use of machinery $1 per acre	1.00
Twine, 50c. per acre	0.50
Total cost per acre	$ 29.54
Yield of grain per acre, 28 bushels, 13 pounds.	
Credit straw, 1 ton 1,204 pounds at $6 per ton	$ 9.61
Cost of wheat per bushel	$ 0.7063

CONTROL OF MUSTARD

In order to determine the best method of controlling wild mustard, a field of spring wheat was treated with a number of different preparations on June 21. None of the preparations used gave complete control. The remaining mustard was pulled on the 7th of July to prevent its seeding. In a number of the plots the wheat foliage was considerably damaged. It made a good recovery, however, and no difference in yields could be noted at the time of harvesting.

The results are shown in the following table:—

Mixture used to destroy mustard	Size of plot in acres	Amount of mixture used per acre	Per cent mustard destroyed	Per cent damage to wheat foliage
Hoffers Charlock Powder	⅛	170 lb.	0	0
12 pounds copper sulphate in 42 gallons of water	½	120 gal.	80	25
100 pounds iron sulphate in 40 gallons of water	¼	120 "	75	20
120 pounds common salt in 100 gallons of water	¼	120 "	85	20

SWEDE TURNIPS

Seven and a half acres of the regular rotation land was seeded to swedes in 1922. This land had been pasture until the spring of 1920 when it was ploughed and manured at the rate of fifteen tons per acre and sown to O.P.V. In 1921 the land was reseeded to O. P. V. without the addition of either manure or fertilizer. The yields of 4 tons, 185 pounds in 1920 and 3 tons, 327 pounds in 1921 indicate that the land was in a rather low state of fertility. This season the land was fall ploughed and manured at the rate of fifteen tons per acre and limed at the rate of 2½ tons per acre. It was then ploughed with the tractor and again manured at the rate of fifteen tons per acre. Six hundred pounds of 4-8-6 fertilizer was applied broadcast just before the land was drilled. Six and a half acres was sown to Good Luck turnips on June 5, June 9, and June 17, and one acre of Kangaroo (1915 seed) was sown on June 20 in order to get turnips to use for seed purposes next year. The land was of a heavy nature and difficult to work as it caked badly in the spring. Owing to wet weather, thinning was delayed until the plants were too large. This made the cost very high.

The roots made excellent growth in the first of the season, but five per cent of them were left on the field at harvest, owing to crown rot. The total yield was 115 tons, 490 pounds.

The cost of production per acre was as follows:—

Rent of land at $3 per acre	$ 3.00
Manure, ½ of 30 tons at 50c	7.50
¼ of 2½ tons of lime at $5 a ton	2.50
¼ of 600 lbs. 4-8-6 fertilizer at $38.14 a ton	5.72
Seed, 2 lbs. at 50c. per lb	1.00
Ploughing, 8 hours at 50c. per hour	4.00
Tractor ploughing, 2·93 hours at 85c. per hour	2.49
Spreading manure, 15·6 hours at 50c. per hour	7.80
Sowing fertilizer, 1·33 hours at 50c. per hour	0.66
Discing and harrowing, 5·86 hours at 50c. per hour	2.93
Tractor disking, 2·47 hours at 85c. per hour	2·10
Planking, 1·73 hours at 50c. per hour	0.86
Ridging, 3·46 hours at 50c. per hour	1.73
Seeding, 0·8 hours at 32c. per hour	0.25
Cultivating, 7·6 hours at 32c. per hour	2.43
Hoeing, 50 hours at 25c. per hour	12.50
Pulling, 45.3 hours at 25c. per hour	11.32
Hauling, 9·46 hours at 50c. per hour	4.73
Use of machinery	0.60
Total cost per acre	$ 74.12
Yield per acre, 15 tons, 732 pounds	
Cost per ton	$ 4.82
Cost per bushel	0·1206

WHITE TURNIPS

One-third of an acre of land which had been in hay the previous year was drilled and sown with white turnips on June 15. The seed failed to germinate and the land was harrowed with the spring-tooth harrow on the 6th of July and seeded to barley.

MANGELS

On May 15, an acre of fall ploughed clover sod was sown with Yellow Intermediate mangels. Owing to the poor catch secured in the spring, the yield was small. They were stored on October 12. The total yield was 9 tons, 960 pounds.

The cost of production per acre was as follows:—

Rent of land at $3 per acre	$ 3.00
Manure, ⅓ of 15 tons at $1 per ton	7.50
Seed, 8 lbs. at 35c. per lb	2.80
Ploughing, 5 hours at 50c. per hour	2.50
Harrowing, 4 hours at 50c. per hour	2.00
Spreading manure, 10 hours at 50c. per hour	5.00
Drilling, 3 hours at 50c. per hour	1.50
Rolling, 0·5 hours at 50c. per hour	0.25
Sowing, 1 hour at 32c. per hour	0.32
Cultivating, 16 hours at 32c. per hour	5.12
Thinning, 40 hours at 25c. per hour	10.00
Hoeing, 4 hours at 25c. per hour	1.00
Transplanting, 1 hour at 25c. per hour	0.25
Pulling, 12 hours at 25c. per hour	3.00
Loading and unloading, 9 hours at 25c. per hour	2.25
Hauling in, 5 hours at 50c. per hour	2.50
Use of machinery	0.60
Total cost per acre	$ 49.59
Yield per acre, 9 tons 960 pounds	
Cost per ton	5.21
Cost per bushel	0.1308

CORN

Corn was grown on 5·63 acres of fall ploughed clover sod from the rotation land. This land was manured in the spring at the rate of 17·86 tons per acre after which it was ploughed and harrowed with the tractor. The corn was sown with a corn planter in rows 3½ feet apart, and 405·5 pounds of 3-8-4 home-mixed fertilizer was applied in the drills at the time of sowing. The corn was sown on May 24, and cut and stored from the 19th to the 23rd of September. It was exceptionally well matured for this district. The total yield was 99 tons, 475 pounds.

The cost of production per acre was as follows:—

Rent of land at $3 per acre	$ 3.00
Manure, ½ of 17·86 tons at $1 per ton	8.93
½ of 405·5 lbs. of 3-8-4 fertilizer at $32.53 a ton	3.29
Seed, 24 lb. corn at $1.65 per bushel (56 lb.)	0.70
Ploughing, 8·9 hours at 50c. per hour	4.45
Tractor ploughing, 3·03 hours at 85c. per hour	2.58
Spreading manure, 7·14 hours at 50c. per hour	3.57
Loading manure, 14·28 hours at 25c. per hour	3.57
Discing and harrowing, 1·78 hours at 50c. per hour	0.89
Discing and harrowing (tractor) 1·6 hours at 85c. per hour	1.36
Rolling, 1·07 hours at 50c. per hour	0.53
Planting, 2·32 hours at 50c. per hour	1.16
Cultivating, 6·6 hours at 50c. per hour	3.30
Cutting, 4·64 hours at 50c. per hour	2.32
Hauling, 9·46 hours at 50c. per hour	4.73
Loading and unloading, 24·14 hours at 50c. per hour	12.07
Tractor silo filling, 5·71 hours at 85c. per hour	4.85
Use of machinery $1 per acre	1.00
Twine	0.50
Total cost per acre	$ 62.80
Yield per acre, 17 tons, 1,253 pounds	
Cost per ton	3.56

Variety Test of Corn—Main Crop

Four varieties of corn were sown on the rotation land. The area sown to each, and the yield per acre is shown in the following table:—

Name of variety	Area sown in acres	Yield per acre	
		tons	lbs.
Wisconsin No. 7	2·193	18	1,612
White Cap Yellow Dent	0·998	18	1,394
Duke Improved White Cap Yellow Dent	2·195	16	542
Northwestern Dent	0·252	14	1,139

SUNFLOWERS

The main crop of sunflowers was grown on part of the same field as the swedes. They received the same amount of manure and lime as the swedes, but were given no commercial fertilizer. They were sown on June 8 and cut on September 5, at which time less than one per cent were in blossom. The experimental work at this Station would indicate that sunflowers should be cut for silage when rather immature. When cut at that time, however, the yield is less than if they were more mature. They were an excellent crop, the total yield being 34 tons, 1,780 pounds.

The cost of this crop per acre is shown in the following table:—

Rent of land at $3 per acre	$ 3.00
Manure, ½ of 30 tons at 50c. per acre	7.50
⅛ of 2½ tons of lime at $5 per ton	2.50
Seed, 10 lb. at 9c. per lb.	0.90
Ploughing, 10 hours at 50c. per hour	5.00
Tractor ploughing, 2·5 hours at 85c. per hour	2.12
Spreading manure, 5 hours at 50c. per hour	2.50
Loading manure 10 hours at 25c. per hour	2.50
Spreading lime, 3 hours at 50c. per hour	1.50
Discing and harrowing, 4 hours at 50c. per hour	2.00
Seeding, 2·5 hours at 50c. per hour	1.25
Cultivating, 9·5 hours at 50c. per hour	4.75
Cutting, 3 hours at 50c. per hour	1.50
Hauling, 9 hours at 50c. per hour	4.50
Tractor silo filling, 4·5 hours at 85c. per hour	3.82
Loading and unloading, 18 hours at 25c. per hour	4.50
Use of machinery at $1 per acre	1.00
Total cost per acre	$ 50.84
Yield per acre, 17 tons, 890 pounds	
Cost per ton	$ 2.91

OATS, PEAS AND VETCHES

This crop was sown on 7¼ acres of fall ploughed pasture. This pasture was in a rather low state of fertility. No manure was applied, but the field was given an application of 1,000 pounds of 4-8-4 home-mixed fertilizer per acre. The field was also given an application of 1 ton 212 pounds of ground limestone per acre. The field was seeded on May 25 at the rate of 3½ bushels per acre with a mixture consisting of two bushels of oats, one bushel of peas and half a bushel of vetches.

One-half of the field was cut for hay on August 17 while in the milk stage. As the weather remained wet, with no signs of clearing, this was put in the silo on August 21. The total yield was 12 tons 850 pounds. The yield per acre was 3 tons 627 pounds. The cost per ton was $9.45.

The remainder of the field was cut on August 22 while in the early dough stage. It was stored as hay on August 30. The total yield was 8 tons 1,240 pounds. The yield per acre was 2 tons 597 pounds, and the cost per ton $13.11.

COST OF PRODUCING SUCCULENT FEED FROM DIFFERENT CROPS

In order to obtain accurate data on the cost per ton and the tonnage per acre of the different succulent feeds, a comprehensive series of experiments was started in the spring of 1922. This experiment includes the growing and keeping records of cost of production, of corn, roots, sunflowers and O.P.V., when grown on uniform land.

These crops were grown on one-year-old clover sod. It was ploughed the previous August and sown with winter wheat. The wheat winter-killed so badly that it was ploughed under on May 29. The land was thoroughly disced and given an application of 1,350 pounds of home-mixed 4-8-6 fertilizer.

It was then divided into four equal plots. The corn and sunflower plots were sown on June 2, and the O.P.V. and turnip plots on June 3. All the crops germinated well, but, owing to the wet weather, the hoed crops were not cultivated or thinned early enough. This made the cost of raising these crops much higher than in a normal year.

Corn

This crop was sown on 1¼ acres on the 2nd of June. One-quarter of an acre of this land was sown with Northwestern Dent and one acre with Duke's Improved White Cap Yellow Dent. This crop was cut on the 23rd of September. The Northwestern Dent was in the early dough stage and the White Cap Yellow Dent in the late milk stage. The total yield was 18 tons 1,945 pounds.

The cost of production per acre was as follows:—

Rent of land at $3 per acre	$ 3.00
½ of 1,350 lb. of 4-8-6 fertilizer at $38.14 per ton	12.87
Tractor ploughing 1·8 hours at 85c. per hour	1.53
Tractor discing and harrowing 0·8 hours at 85c	0.68
Sowing fertilizer, 1·6 hours at 50c. per hour	0.80
Seed, 24 lb. corn at $1.65 per bushel (56 lb.)	0.70
Seeding, 2·0 hours at 50c. per hour	1.00
Weeding, 3·2 hours at 32c. per hour	1.02
Cultivating, 4·8 hours at 50c. per hour	2.40
Hand weeding, 20 hours at 25c. per hour	5.00
Cutting, 2·4 hours at 50c. per hour	1·20
Hauling, 12·4 hours at 50c. per hour	6·20
Loading and unloading, 21·6 hours at 50c. per hr	10·80
Tractor filling silo, 4 hours at 85c. per hour	3.40
Use of machinery	1·00
Total cost per acre	$ 51.60
Yield per acre, 15 tons 356 pounds	
Cost per ton	$ 3.39

Turnips

One and a quarter acres were sown with Good Luck turnip (Fredericton seed) on the 3rd of June. They were pulled on October 27. The total yield was 23 tons 1,215 pounds.

The cost of production per acre was as follows:—

Rent of land at $3 per acre	$ 3.00
½ of 1,350 lb. 4-8-6 fertilizer at $38.14 a ton	12.87
Tractor ploughing, 1·8 hours at 85c. per hour	1.53
Discing and harrowing (tractor) 0·8 hours at 85c	0.68
Sowing fertilizer, 1·6 hours at 50c. per hour	0.80
Seed, 2 lbs. at 50c. per lb	1.00
Ridging, 4·0 hours at 50c. per hour	2.00
Seeding, 0·8 hours at 25c. per hour	0.20
Cultivating, 9·6 hours at 37c. per hour	3·55
Thinning, 37·6 hours at 25c. per hour	9.40
Hoeing, 16 hours at 25c. per hour	4.00
Pulling, 40 hours at 25c. per hour	10.00
Hauling in, 7·2 hours at 50c. per hour	3.60
Use of machinery per acre	0.60
Total cost per acre	$ 53.23
Yield per acre, 18 tons, 1,772 pounds	
Cost per ton	$ 2·812

Sunflowers

Mammoth Russian sunflowers were sown on 1¼ acres on June 2. They were cut on the 30th of August, when less than ·05 per cent were in blossom. The total yield was 8 tons 195 pounds.

Sunflowers, a promising silage crop when corn cannot be successfully grown.

The cost of production per acre was as follows:—

Rent of land at $3 per acre	$ 3.00
One-half of 1,350 lb. of 4–8–6 fertilizer at $38.14 per ton	12.87
Tractor ploughing, 1·8 hours at 85c. per hour	1.53
Discing and harrowing (tractor) 0·8 hours at 85c. per hour	0.68
Sowing fertilizer, 1·6 hours at 50c. per hour	0 80
Seed, 10 lb. at 20c. per lb	2.00
Seeding, 2 hours at 50c. per hour	1.00
Weeding, 3·2 hours at 50c. per hour	1.60
Cultivating, 4·8 hours at 50c. per hour	2.40
Hand weeding, 24 hours at 25c. per hour	6.00
Cutting, 4 hours at 50c. per hour	2.00
Hauling, 14 hours at 50c. per hour	7.00
Loading and unloading, 25 hours at 25c. per hour	6.25
Tractor filling silo, 2·4 hours at 85c. per hour	2.04
Use of machinery	1.00
Total cost per acre	$ 50.17
Yield per acre, 6 tons 956 pounds.	
Cost per ton	$ 7.74

Oats, Peas and Vetches

The oats, peas and vetches were sown on the 3rd of June on 1¼ acres of land. A mixture consisting of two bushels of oats, one bushel of peas and a half bushel of vetches was sown at the rate of 3½ bushels per acre. The crop was cut on the 17th of August, while in the milk stage. The total yield was 9 tons 500 pounds.

The cost of production per acre was as follows:—

Rent of land at $3 per acre	$ 3.00
One-half of 1,350 lb. of 4–8–6 fertilizer at $38.14 per ton	12 87
Tractor ploughing, 1·8 hours at 85c. per hour	1.53
Tractor discing and harrowing 0·8 hours at 85c	0.68
Sowing fertilizer, 1·6 hours at 50c. per hour	0.80
Cost of seed per acre	6.30
Seeding 0·8 hours at 50c. per hour	0.40
Cutting, 1·6 hours at 50c. per hour	0.80
Hauling, 5·6 hours at 50c. per hour	2.80
Loading and unloading, 24 hours at 25c. per hour	6.00
Filling silo, tractor, 3·2 hours at 85c. per hour	2.72
Use of machinery per acre	1.00
Total cost per acre	$ 38.90
Yield per acre, 7 tons 800 pounds.	
Cost per ton	$ 5.25

SUMMARY

Cost of producing one acre	Corn	Swedes	Sunflowers	O.P.V.
Rent of land, fertilizer and preparation	$18 88	$18 88	$18 88	$18 88
Seed	0 70	1 00	2 00	6 30
Seeding operation	1 00	2 20	1 00	0 40
Cultivation operations	8 42	16 95	10 00	
Harvesting and storing	21 60	13 60	17 29	12 32
Use of machinery	1 00	0 60	1 00	1 00
Total cost per acre	51 60	53 23	50 17	38 90
Yield	15 tons 356 lb.	18 tons 1,772 lb.	6 tons 956 lb.	7 tons 800 lb.
Cost per ton	$3 39	$2 81	$7 74	$5 25

HORTICULTURE

ORCHARD

The orchard came through the winter of 1922 in good condition. The cold weather in April and May retarded the bloom until danger of frost was past. The last frost was on the 4th of May, when five degrees of frost was recorded. The bloom was ten days later than the previous year. The Fameuse bloomed on May 27, and the McIntosh on May 28. A good set of fruit was secured of nearly all varieties and the orchard yielded a heavy crop for its age.

LAND AND FERTILIZER

The orchard was planted in 1914 on rolling, stony, medium clay loam. No commercial fertilizer was applied previous to 1922, but each year since the orchard was planted it has been given an application of barnyard manure at the rate of fifteen tons per acre. In 1922 no manure was applied, but three pounds of nitrate of soda was applied in May at the root of each tree.

WORK

The orchard work at this Station includes: (1) spraying and dusting experiments in apple orchard, (2) growing a commercial apple orchard, (3) cultural experiments, (4) testing new and little known varieties of apples, (5) testing varieties of plums, (6) testing varieties of pears, and (7) testing varieties of cherries.

SPRAYS

All the orchard was sprayed three times and the Fameuse and McIntosh, which are especially susceptible to scab, were sprayed four times. The dates of spraying and the material used were as follows:—

DATES OF SPRAYING AND MATERIAL USED

Date of Spraying	Material used
May 22	3-10-40 Bordeaux plus 1½ lb. arsenate of lime.
June 8	Soluble sulphur—1 lb., arsenate of lime—½ lb. Hydrated lime—5 lb., water—40 gallons.
June 23	3-10-40 Bordeaux plus 1½ lb. arsenate of lime.
*July 21	3-10-40 Bordeaux plus 1½ lb. arsenate of lime.

*The July spray was only applied to Fameuse and McIntosh, to prevent scab.

SPRAYING VERSUS DUSTING

A spraying and dusting experiment with McIntosh and Fameuse apples was conducted in co-operation with the Dominion Entomological Branch. The dust was mixed at this Station. A 12-8-80 copper arsenic dust, made by mixing twelve pounds of dehydrated copper sulphate, eight pounds of arsenate of lime and eighty pounds of hydrated lime, was applied on May 22. A 90-10 sulphur-lead arsenate dust, made by mixing ninety pounds of superfine sulphur dust and ten pounds of arsenate of lead, was applied on the 7th of June. The 12-8-80 copper arsenate dust was again applied on June 20 and July 20. The dust was applied in the evening with an engine-driven duster. The liquid spray was as previously noted. The results were as follows:—

SPRAYING VS. DUSTING

—	McIntosh				Fameuse			
	Per cent scab	Per cent russet	Per cent insect injury	Per cent free from scab, russet, insect or other injury	Per cent scab	Per cent russet	Per cent insect injury	Per cent free from scab, russet, insect or other injury
Dust	11·54	30·40	3·72	56·39	1·24	26·36	4·67	61·05
Spray	6·28	41·10	8·29	50·33	1·41	51·11	5·10	45·82
Check	64·59	0	18·71	30·04	12·11	0	28·90	69·90

COMMERCIAL ORCHARD

This orchard was planted in 1914 in order to obtain data on yields and hardiness of the varieties of apples considered best adapted for New Brunswick conditions. The orchard remained in sod and a swath six feet wide was cut on

both sides of the trees in June and left on the ground as mulch. The remainder of the hay was harvested. An application of nitrate of soda, at the rate of three pounds per tree, was made in May. The varieties grown and yields are shown in the following table.

COMMERCIAL ORCHARD—TEST OF VARIETIES

Variety	Number of trees	Number of trees bearing fruit	Total yield	Average yield per bearing tree
			pecks	pecks
Milwaukee	30	29	204·37	7·04
Wolf River	15	15	100·25	6·68
Fameuse	26	25	166·25	6·65
Northwestern Greening	5	3	19·00	6·33
Crimson Beauty	30	28	173·25	6·18
Alexander	23	21	128·25	6·10
Dudley	23	23	130·75	5·68
New Brunswick	12	12	66·00	5·50
Canada Baldwin	4	4	21·50	5·37
McIntosh	12	9	37·66	4·18
Duchess	29	26	93·58	3·60
Wealthy	26	20	71·00	3·55
American Golden Russet	15	12	30·83	2·56
Bethel	18	8	13·12	1·64
Red Astrachan	1	1	1·00	1·00
Salome	4	2	17 apples	8 apples

CULTURAL ORCHARD

On half of this orchard a new cultural experiment was laid out during the season with Wealthy, Dudley and McIntosh varieties. The object of this experiment is to test (1) sod with grass mulch, (2) clean cultivation, (3) partial cultivation (Johnson method). One section was left in sod; one section was kept cultivated and in the other section the land on one side of the trees was cultivated and that on the other side of the trees was left in sod.

CULTURAL ORCHARD

The remainder of the cultural orchard was left in permanent sod. On one-half of the part in permanent sod the grass was cut and allowed to remain on the ground as a mulch. On the other half it was cut and made into hay and removed. No manure was applied, but in May the cultural orchard was given an application of three pounds of nitrate of soda per tree. In this section, Fameuse and McIntosh were planted in alternate rows. The yields for the permanent sod section of the cultural orchard are shown in the following table.

YIELDS IN CULTURAL ORCHARDS

Variety	Treatment	Number of trees	Number bloomed	Number of trees bearing	Average per cent bloom on trees which bloomed	Average yield per bearing tree
						pecks
Fameuse	Grass cut and left as mulch	17	17	17	57·0	11·05
McIntosh	" "	15	14	14	62·8	10·61
Fameuse	Grass cut and removed	25	24	24	46·3	8·27
McIntosh	" "	18	17	17	50·3	5·7

TEST OF NEW VARIETIES OF APPLES

The variety orchard remained in sod during the season. No manure was applied this year, but in May the trees were given an application of three pounds of nitrate of soda per tree. In June, the hay for eight feet around each tree was cut and left as a mulch. The results from four years' fruitage show that the best varieties to date are:—Early varieties—Charlamoff and Melba; Autumn varieties—Luke, Kildare, Lobo and Medford; Winter varieties—Northern Spy Seedling O-430, Northern Spy Seedling O-360, Rosalie, Homer, Thurso, Tasty, Sonora. Cobalt, Marcus, Rocket, Bruno, Elmer, Kim.

One early variety, the Melba, promises to become a good commercial variety and worthy of distribution, and one autumn variety, the Lobo, is also worthy of distribution. There are several promising winter varieties, but the work has not progressed far enough as yet to recommend any of them.

VARIETY TEST OF PLUMS

The plum orchard gave a rather low yield last season. The orchard was in sod throughout the season and a crop of hay was taken off it. No manure was applied during the season, but in May each tree was given an application of two pounds of nitrate of soda. The yields are as follows:—

PLUMS—TEST OF VARIETIES

Variety	Number of trees	Number of trees bearing	Total yield
			quarts
Lombard	5	5	33·50
Moore Arctic	14	8	25·75
Yellow Egg	4	3	11·25
Shropshire Damson	5	5	10·75
Shipper Pride	5	3	7·50
Imperial Gage	17	8	7·12
Latchford	2	2	3·50
Washington	5	2	3·00
Red June	5	5	2·75
Glass Seedling	2	2	1·75
Burbank	3	3	0·62
Gueii	5	2	0·62
Bradshaw	4	0	
John A	2	0	
Stanton	1	0	
Climax	1	0	
Windsor	1	0	
Omaha	5	0	

VARIETY TEST OF PEARS

The pear orchard remained in sod during the year. No manure was applied, but in May the trees received two pounds of nitrate of soda per tree. The winters here are too severe for most of the varieties of pears. The Lawrence, Bartlett and Anjou varieties are making very little progress. The Flemish Beauty and Clapp Favourite are apparently more hardy. They have made fair growth and have yielded a few pears during the year.

VARIETY TEST OF CHERRIES

The cherry orchard remained in sod during the year. No manure was applied, but in May the trees were given an application of two pounds of nitrate of soda per tree. There was a good set of fruit, but the most of it was destroyed by birds, therefore the yields were not indicative of the value of the trees. The

yields from French Morello, Susse Fruhe Weichsel, Orel, Minnesota d'Ostheim, Early Richmond and Dyehouse were not worth recording. The yields are shown in the following table.

CHERRIES—TEST OF VARIETIES

Variety	Number of trees	Number of trees bearing	Total yield
			quarts
English Morello	4	4	32·75
Orel 25	8	4	5·87
Wragg	3	2	4·50
Lieb	2	1	1·50
Montmorency	10	1	1·00
Vladimer	2	2	0·87
Hertz Formige Weichsel	1	1	0·87
Empress Eugenie	4	1	0·50
Orel 24	4	2	0·25

SMALL FRUITS

Conditions in 1922 were very favourable to bush fruits. The snowfall was even and of moderate depth. The cold spring delayed blossoming until danger from frost was past and good sets of fruit were secured in nearly all varieties. Owing to good growing weather throughout the summer, the fruit was large and of good quality and the yields were considerably larger than for the previous year.

SOIL AND FERTILIZER

The land devoted to bush fruits is a clay loam with a sandy loam sub-soil, and is underdrained. Barnyard manure is applied each fall at the rate of twenty-five to thirty tons per acre, in the form of a mulch. This is turned under in the spring. The rows are five feet apart and the ground between is kept fallow with a horse cultivator during the summer months. In most cases the yield of bush fruits is based on the yield from six bushes. The yields are shown in the following table.

VARIETY TEST OF BLACK CURRANTS

Variety	Yield per acre	Number of years grown	Average yield per acre
	quarts		quarts
Saunders	14,036·0	5	6,592·0
Lee Prolific	9,744·0	5	6,893·2
Kerry	9,486·4	5	6,993·3
Eagle	7,453·6	5	4,446·3
Eclipse	7,163·2	5	6,146·8
Topsy	6,776·0	5	6,086·1
Victoria	5,808·0	3	3,855·8
Magnus	4,549·6	5	4,317·2
Climax	4,501·2	5	4,549·6
Boskoop Giant	4,404·0	5	3,320·2
Buddenborg	3,968·8	5	5,161·4
Black Champion	3,194·4	4	3,581·4
Clipper	3,097·6	5	2,187·6
Collin Prolific	1,548·8	5	5,362·7

VARIETY TEST OF RED CURRANTS

Variety	Yield per acre	Number of years grown	Average yield per acre
	quarts		quarts
Red Cross	5,517·6	5	3,339·6
Perfection	5,033·6	5	3,475·1
Rankin Red	3,775·2	5	1,210·0
Red Dutch	3,484·8	5	3,678·4
Cumberland	3,194·4	4	1,077·0
Victoria	3,194·4	5	1,873·0
Diploma	2,904·0	4	2,305·0
Greenfield	2,390·4	4	1,113·8
Red Grape	2,323·2	4	1,560·9
Chautauqua	2,129·6	4	2,105·4
Wilder	2,088·0	5	1,642·6
Fay Prolific	2,032·8	4	1,288·6
Cherry	1,355·2	2	1,645·6
Admirable	290·4	2	242·0

VARIETY TEST OF WHITE CURRANTS

Large White	5,420·8	4	1,851·3
White Cherry	3,712·0	5	1,778·8
White Grape	3,291·2	5	1,858·5

VARIETY TEST OF GOOSEBERRIES

Pearl	4,452·8	4	3,230·7
Downing	2,516·8	4	1,592·9
Lancer	1,422·9	4	975·1
Oregon Everbearing	1,393·9	4	4,045·4
Surprise	1,267·2	4	756·8
Whitesmith	1,159·2	4	465·7
Victoria	850·3	4	422·3
Katherine	580·8	3	1,032·5
Leader	580·8	2	580·8
Careless	580·8	4	459·8
Lancashire Lad	497·7	3	338·6
Keepsake	496·8	4	486·3
Industry	387·2	4	435·6
Ocean	373·2	4	382·0
Glenton Green	348·0	3	273·6
May Duke	165·9	4	828·6

VARIETY TEST OF RASPBERRIES

Newman Seedling No. 23	2,274·8	4	2,099·3
Herbert	2,200·0	4	2,260·4
Brighton	1,716·0	4	1,355·7
St. Regis	1,621·4	4	1,088·6
Newman Seedling No. 24	1,597·2	4	1,582·5
King	1,562·0	4	786·3
Golden Queen	1,430·0	3	516·9
Newman Seedling No. 1	1,403·6	4	1,125·2
Newman Seedling No. 6	1,210·0	4	568·7
Marlboro	1,144·0	4	1,347·3
Sarah	858,0	4	847·0
Newman Seedling No. 20	822·8	4	435·6
Shaffer	484·0	3	909·3
Ruby	374·0	4	548·4
Columbian	110·0	3	220·0

VARIETY TEST OF STRAWBERRIES

The 1922 crop of strawberries was grown on garden land. This land received an application of barnyard manure at the rate of thirty tons per acre, in the spring of 1921. This manure was ploughed under after which the land was put in good tilth with the disc and spike-tooth harrows. On May 23 the plants were set out in rows three feet apart and eighteen inches between plants. There were very few misses, but, owing to the dry weather, the plants put out very few runners. They were mulched with straw in December and came through the winter in good condition. The set of fruit in the spring was rather poor and a large percentage of it was spoiled by wet weather. The yields were as follows:—

STRAWBERRIES—TEST OF VARIETIES.

Variety	Yield per acre quarts.	Per cent stand	Width of rows inches	Number of years grown	Average yield per acre quarts
Glen Mary	3,091·4	98	18	3	4,534·9
Jersey Giant	2,865·2	95	14	3	3,637·6
Ozark	2,846·3	98	18	3	3,333·6
Senator Dunlap	2,375·1	90	16	3	5,155·9
Lavinia	2,337·4	95	18	3	3,364·5
K. Prize	2,280·8	92	18	2	3,809·8
Warfield	2,111·2	90	13	3	4,105·7
Bubach	2,054·6	90	14	3	3,927·4
Parsons Beauty	2,050·9	92	14	3	3,297·3
Viola	1,998·1	98	18	3	3,892·6
Bianca	1,960·4	100	24	3	3,686·9
Julia	1,696·4	98	18	3	2,483·8
Cassandra	1,696·4	90	15	3	3,249·4
Beder Wood	1,692·7	90	18	3	4,056·1
Portia	1,658·8	98	18	3	3,594·9
Sample	1,545·7	90	15	3	4,331·4
Billy Sunday	1,526·8	92	14	3	2,058·6
President	1,394·9	85	15	2	1,973·4
Americus	1,343·4	92	16	2	2,944·1
K. Premier	1,319·5	90	13	3	5,126·9
Williams Improved	1,281·8	92	18	3	2,687·8
Dr. Burrill	1,108·3	70	12	3	3,254·3
Black Beauty	1,107·9	85	12	3	1,965·1
Charles I	848·2	70	9	3	2,049·9
Ophelia	810·6	75	12	3	2,424·5
Premier	760·2	80	11	3	1·944·7
Rewastico	640·9	70	16	3	2,335·7
Grand Prize	618·2	50	12	3	2,111·1
Splendid	603·2	50	12	2	1,335·6
Cordelia	599·4	98	18	3	1,268·6
Commonwealth	565·5	65	12	3	2,428·0
Mariana	542·9	40	10	3	2,818·2
Brandywine	377·0	85	18	3	1,976·7
Superb Fall Bearing	339·3	65	10	2	1,452·8
Progressive	245·0	50	12	1	1,780·1

VARIETY TEST OF GRAPES

The grape vines were laid down in December of the previous year and mulched with strawy manure. They came through the winter in good condition. Owing to the early frost most varieties did not thoroughly ripen. A heavy frost on September 28 caught some of the grapes. The yields are shown in the following table.

VARIETY TEST OF GRAPES

Variety.	Yield per vine pounds	Number of years grown	Average yield per vine pounds
Vergennes	15·6	3	10·20
Lindley	11·3	4	9·06
Mary	11·0	4	7·52
Delaware	9·8	4	5·98
Wilkins	9·7	4	8·18
Hartford	9·3	4	8·00
Beta	9·1	4	8·90
Early Daisy	8·0	4	7·57
Merrimac	6·5	4	3·62
Canada	6·5	4	2·85
Salem	6·2	3	6·86
Rogers	5·8	4	7·05
Florence X Potter	5·3	4	4·03
Moore Early	4·0	3	2·91
Peabody	3·5	4	5·34
Brighton	3·1	4	2·86
Brant	2·3	4	2·21
Moore Diamond	1·5	4	2·83

VEGETABLES

SOIL

The land devoted to vegetable experiments is a clay loam with a sandy loam subsoil and is underdrained. It has been in garden crops since 1913. Barnyard manure was applied annually at the rate of twenty-five to thirty tons per acre, and the land is therefore in a high state of fertility and is very uniform. It is badly infested, however, with insect pests such as cutworms, slugs, cucumber beetles and flea beetles.

This spring, the land received an application of barnyard manure at the rate of twenty-five tons per acre. It was then ploughed and given an application of ground limestone at the rate of two and one-half tons per acre. This was harrowed in, and the land put in a high state of tilth by means of the disc, smoothing harrow and roller.

The experimental work with vegetables for this season included, (1) variety tests of various vegetables, (2) a study of methods of growing tomatoes, (3) an experiment on the control of root maggots in cabbage. The root maggot work was rendered useless on account of the development of club root in the cabbage.

BEANS

The varieties of beans listed below were sown in 66-foot rows on June 5. Masterpiece, Yellow Eye, and Hodson Wax were free from anthracnose. Hodson Long Pod and Kentucky Wonder were so badly infected that they had to be hand-picked before they were saleable. The Refugee and Stringless Green Pod were so badly infected as to be unsaleable. All the other varieties were so badly infected that they were practically worthless. The wet summer of 1922 helped to spread this disease and made the infection worse than usual, though each year a large percentage of the beans are ruined by this disease. There is great need of resistant strains of both ripe and green beans for New Brunswick, as the driving rains in summer scatter sand over the plants and thus spread the infection.

Ripe Beans

The varieties tested below were sown in rows 66 feet long and 2½ feet apart, on the 5th of June. The yields were as follows:—

RIPE BEANS—TEST OF VARIETIES

Variety	Source	Yield per acre	
		bush.	lb.
Hodson Long Pod, Ottawa-1635	Ottawa	33	
Masterpiece, Ottawa-1916	"	26	24
Refugee, Ottawa-1631	"	23	6
Extra Early Valentine, Ottawa-1632	"	20	21
Hodson Wax	Harris	20	4
Stringless Green Pod	Burpee	19	48
Plentiful French, Ottawa-1639	Ottawa	19	15
Bountiful Green Bush, Ottawa-1633	"	18	25
Stringless Green Pod, Ottawa-1630	"	17	36
Refugee	Carter	14	18
Yellow Eye, Ottawa 1643	Ottawa	14	18
Round Pod Kidney Wax	Graham	11	..
Pencil Pod Black Wax, Ottawa-1642	Ottawa	11	..
Wardell Kidney Wax, Ottawa-1634	"	6	36
Davis White Wax	McDonald	6	36
Rustless, Ottawa-1628	Ottawa	5	30
Stringless Green Pod	Burpee	5	30
Fordhook Favourite	"	5	30
Wardell Kidney Wax	Graham	4	57
Fordhook Favourite, Ottawa-1641	Ottawa	4	57
Round Pod Kidney Wax, Ottawa-1638	"	4	57
Davis White Wax		4	24
Kentucky Wonder, Ottawa-1689	Ottawa	Did not ripen.	
Fordhook Bush Lima	D. M. Ferry	Poor stand.	

Green Beans

A duplicate planting of the above varieties was made on June 5, in 33-foot rows in order to study the yields of green beans. Only three varieties, namely, Masterpiece, Hodson Wax and Yellow Eye were free from anthracnose. The others were so badly infected as to be unsaleable. The yields were as follows:—

GREEN BEANS—TEST OF VARIETIES

Variety	Source	Yield of green pods per acre pecks	Per cent anthracnose infection
Masterpiece, Ottawa-1916	Ottawa	3,696	0
Kentucky Wonder Wax, Ottawa-1689	"	3,696	50
Refugee, Ottawa-1631	"	2,772	75
Refugee	Carter	2,574	88
Hodson Wax	Harris	2,508	0
Hodson Long Pod, Ottawa-1635	Ottawa	2,508	50
Plentiful French, Ottawa-1639	"	2,310	100
Stringless Green Pod	Burpee	2,244	100
Extra Early Valentine, Ottawa-1632	Ottawa	2,112	100
Yellow Eye, Ottawa-1643	"	2,112	0
Bountiful Green Bush, Ottawa-1633	"	2,046	100
Grennell Rustless, Ottawa-1628	"	2,046	100
Davis White Wax		1,584	100
Round Pod Kidney Wax	Graham	1,320	100
Davis White Wax	McDonald	1,320	100
Pencil Pod Black Wax, Ottawa-1642	Ottawa	1,320	100
Stringless Green Pod, Ottawa-1630	"	1,320	90
Challenge Black Wax, Ottawa-1915	"	1,254	100
Wardwell Kidney Wax, Ottawa-1624	"	1,122	100
Wardwell Kidney Wax	Graham	1,056	100
Round Pod Kidney Wax, Ottawa-1638	Ottawa	1,056	100
Fordhook Favourite, Ottawa-1641	"	924	100
Fordhook Favourite	Burpee	132	100
*Harlington Windsor	Steele-Briggs	1,386	0

*Harlington Windsor is a broad bean.

BEETS

The varieties listed below were sown on May 23 in 66-foot rows, 2½ feet apart. The yields obtained do not indicate the market value of the crop as the Early Wonder, Eclipse and Crimson Globe grew so large that they could not be marketed to any advantage. The Detroit Dark Red, Crosby Egyptian and Black Red Ball were the best in quality. In a favourable season, when beets are sown as early as the 23rd of May, the heavy yielding varieties grow too large for winter use. A project on date of seeding will be started next season. The yields were as follows:—

GARDEN BEETS—TEST OF VARIETIES

Variety	Source	Yield per acre		Number of years grown	Average yield per acre	
		tons	lb.		tons	lb.
Early Wonder	McDonald	39	1,716	4	21	918
Eclipse	"	27	1,968	8	18	251
Crimson Globe	"	25	424	4	25	1,315
Cardinal Globe	Rennie	23	1,520	2	16	1,584
Detroit Dark Red	McDonald	20	1,448	3	25	468
Black Red Ball	Burpee	15	1,944	6	13	917
Crosby Egyptian	Harris	15	656	6	16	570

BRUSSELS SPROUTS

Brussels sprouts were planted in the hot bed but developed club root. Seed was again sown outside on the 8th of June. The yields were as follows:—

Variety	Weight of 40 plants	Number of years grown	Average weight of 40 plants
	lb.	lb.	lb.
Amager Market	17·7	2	22·8
Dalkeith	82·2	1	82·2

CABBAGE

The varieties of cabbage tested below were transplanted from the hot-bed into drills 66 feet long and 2½ feet wide on June 7. They were set eighteen inches apart in the drill, but as a number of heads of each variety were destroyed by club root, the yield per acre was estimated from the weight of twenty-five head, 11,000 head being taken to represent the number that would grow on an acre. The yields were as follows:—

CABBAGE—TEST OF VARIETIES

Variety	Source	Yield per acre		Average weight of heads 1922	Number of years grown	Average weight of heads
		tons	lbs.	lbs.		lbs.
Early Winnigstadt	Steele-Briggs	42	40	7·60	2	6·90
Ex. Amager Danish Ball Head, Ottawa—1193	Ottawa	41	280	7·48	1	7·48
Succession	Ewing	40	1,400	7·40	3	6·23
Ex. Amager Danish Ball Head, Ottawa—934-2-3	Ottawa	39	1,640	7·24	1	7·24
Marblehead Mammoth	Ewing	36	1,260	6·60	3	7·40
Fottler Improved Brunswick	Ewing	35	1,280	6·48	3	6 57
Danish Round Head	Harris	33	1,320	6·12	2	7·06
Flat Swedish	Lennoxville	32	240	5·84	2	6·54
Enkhuizen Glory	Rennie	27	1,000	5·00	2	6·30
Perfection Drumhead Savoy	Ewing	26	360	4·76	2	4·98

CARROTS

The following varieties were sown on the 23rd of May in rows 66 feet long. The yields were as follows:—

Variety	Source	Yield per acre		Number of years grown	Average yield per acre	
		tons	lb.		tons	lb.
Ox Heart	Dupuy & Ferguson	18	1,224	3	15	624
Danvers	Rennie	18	1,224	3	17	1,200
Nantes Half Long	Steele Briggs	15	1,944	3	14	512
Improved Danvers	Dupuy & Ferguson	14	1,040	2	13	796
Chantenay, Ottawa, 206-9	Ottawa	12	24	1	12	24
Early Scarlet Horn	Dupuy & Ferguson	9	480	5	11	442

CELERY

The celery was sown in the hot-bed on April 12, pricked out on May 17 and transplanted outside on July 7. Bordeaux mixture was sprayed on the plants once, in the hot-bed, and twice after transplanting, during the month of July. The wet summer, however, favoured the spread of fungous diseases and all varieties of celery became infected with celery rust. It is evident that spraying, to be effective, must be continuous. Golden Yellow, White Plume and Early Blanching are good early varieties. Giant Pascal and Evans Triumph are good late varieties. The yields were as follows:—

CELERY—TEST OF VARIETIES

Variety	Source	Yield per acre		Number of years grown	Average yield per acre	
		tons	lb.		tons	lb.
Giant Pascal	Graham	21	600	8	24	1,365
Golden Self Blanching Ottawa—229-30	Ottawa	19	400	2	21	1,200
French Success	Harris	19	400	7	21	506
Evans Triumph	McDonald	18	–	8	23	612
Easy Blanching	"	14	800	2	24	1,500
Golden Yellow	Graham	14	80	8	18	435
Winter Queen	"	12	1,550	6	21	750
White Plume	"	7	400	8	19	287

CORN

The corn was sown in rows 66 feet long and 3 feet wide, on May 25. The Golden Bantam was very much superior to the other varieties in quality. This corn is a fair yielder and can be heartily recommended to corn growers in districts where it will mature. The yields are shown in the following table:—

TABLE CORN—TEST OF VARIETIES

Variety	Ready for use	Per cent stand	Average weight of ears	Number of ears per acre	Number of years grown	Average yield per acre
			lb.			ears
Pickaninny, Ottawa—54-20.	Aug. 15	100·0	·200	18,040	1	18,040
Ex. Early Adams	" 24	92·6	·580	12,100	7	14,087
Ex. Early Mayflower (McDonald).	" 29	100·0	·428	16,060	4	17,486
Extra Early Cory (McDonald).	" 30	100·0	·450	21,340	4	20,181
Early Malcolm, Ottawa—1718.	" 31	100·0	·417	30,140	1	30,140
Golden Bantam	" 31	100·0	·393	22,000	6	15,940
Whipple New Yellow Willett.	Sept. 5	96·3	·457	22,880	1	22,880
Pocahontas	" 6	96·3	·500	17,820	6	14,633
Early Fordhook	" 6	96·3	·433	18,700	7	17,432
Howling Mob	" 6	100·0	·555	22,660	3	15,469
Sweet Squaw, Ottawa—1445-7.	" 8	100·0	·500	28,380	1	28,380
Metropolitan Sweet (Vaughan).	" 13	96·3	·636	18,920	3	17,499
*Black Mexican (McDonald)	" 19	100·0	·575	18,040	3	15,235
Evergreen Bantam	" 22	88·9	·75	13,200	3	12,315
Earliest Catawba	" 23	100·0	·50	18,920	1	18,920
New Golden Giant	" 23	100·0	·635	21,120	1	21,120
*Stowell Evergreen (Graham).	" 26	100·0	·943	15,400	5	13,757
*Country Gentleman (Graham).	" 26	59·2	·734	7,040	5	11,333
Early July (ripened)	" 26	100·0	·335	36,740	1	36,740
Tom Thumb Pop Corn (ripened).	" 26	92·6	·148	19,360	4	36,568

*Black Mexican, Stowell Evergreen and Country Gentleman were grown two additional years in which they did not make marketable ears.

CUCUMBERS

The seed was sown on May 26, but the young plants were all destroyed by cutworms, cucumber and flea beetles. A second planting was made on June 16 and was also destroyed.

The land was treated with poisoned bran previous to the second planting and this treatment killed the cutworms. Both plantings were sprayed with poisoned Bordeaux twice a week. This treatment had no apparent effect. The beetles stayed on the lower side of the leaves and were apparently not affected by the spray. To combat successfully a bad attack of cucumber and flea beetles with poisoned Bordeaux, the plant should be sprayed each day.

EGG PLANT

Seed of two varieties was sown in plots in the hot bed on the 26th of May. The young plants were transplanted in the open on the 10th of June. No fruit developed. The work at this Station indicates that the varieties of egg plants tested are of no economic importance in this district.

LETTUCE

Nine varieties of lettuce were sown in the field on May 3. They all made fair growth. All Heart, a headed variety, was the best yielder and was also of the best quality.

ONIONS

Seed was sown in the open in rows 1½ feet apart on the 3rd of May. Corrosive sublimate, one ounce to ten gallons of water, was applied along the drill

as soon as the plants broke ground, and every tenth day thereafter until July 15, in order to combat root maggots. The crop was clean, but as there was no check plots, it cannot be stated definitely that the land was infected with root maggots. The yields are shown in the following table:—

ONIONS—TEST OF VARIETIES

Variety	Source	Yield per acre	Number years grown	Average yield per acre
		tons lbs.		tons lbs.
Large Red Wethersfield, Ottawa—988	Ottawa	25 1,260	1	25 1,260
Ailsa Craig	Graham	25 1,260	6	14 1,018
Giant Yellow Prize Taker	Steele-Briggs	23 640	4	15 912
Yellow Globe Danvers, Ottawa—931-2	Ottawa	22 1,760	1	22 1,760
Yellow Globe Danvers	Steele-Briggs	21 1,780	7	16 1,560
Southport Yellow Globe	Ewing	17 1,640	4	14 562
Southport White Globe	Steele-Briggs	15 1,020	4	12 667
Southport Red Globe	Steele-Briggs	15 580	4	12 25
Australian Brown	McDonald	14 1,480	4	11 1,100
White Barletta	"	14 160	2	9 15
Extra Early Flat Red	"	13 400	4	13 45

PARSNIPS

Two varieties were sown on the 25th of May, in 66-foot rows 2½ feet apart. The yields were as follows:—

Variety	Source	Yield per acre
		tons lbs.
Hollow Crown, Ottawa—1046	Ottawa	12 1,344
Guernsey	Rennie	10 592

PEAS

The varieties tested below were sown on the 22nd of May in rows 66 feet long and 3½ feet apart. The vines were not staked but were laid in one direction in the rows. The yields were as follows:—

GARDEN PEAS—TEST OF VARIETIES

Variety	Source	Date first picked	Yield per acre	Number of years grown	Average yield per acre in pecks
			pecks		
Alaska	Carter	July 12	801·4	3	627·9
Eight Weeks	"	" 17	282·8	2	565·7
Little Marvel	Rennie	" 22	707·1	5	735·4
Laxtonian	Graham	" 22	707·1	7	752·4
Thos. Laxton	McDonald	" 22	707·1	9	980·5
Gradus	Carter	" 24	895·7	9	863·6
American Wonder	"	" 24	612·8	9	624·1
Gregory Surprise	Gregory	" 24	377·1	9	746·7
Pioneer	"	" 25	707·1	4	511·0
Sutton Excelsior	Harris	" 25	612·8	9	790·1
Laxtonian, Ottawa—1648-63	Ottawa	" 27	942·8	1	942·8
Blue Bantam	Ewing	" 28	141·4	1	141·4
English Wonder, Ottawa—1644	Ottawa	Aug. 1	612·8	1	612·8
McLean Advancer	Harris	" 8	377·1	2	612·8
Harrison Glory	Invermere	" 18	518·5	1	518·5
Lincoln	"	" 18	471·4	1	471·4

PEPPERS

Seed was sown in flats on the 12th of April. The young plants were transplanted into the garden on the 10th of June. The yields were as follows:—

Variety	Source	Yield per acre	Number years grown	Average yield per acre
		lbs.		lbs.
Neapolitan	Summerland	2,491	3	1,710·3
Harris Earliest	"	2,310	4	5,709·0
Red Chili	McDonald	825	4	932·2
Cayenne	Graham	693	3	2,497·0
Pimento	McDonald	396	2	462·0

PUMPKINS

Eight varieties of pumpkins were planted on the 26th of May, but were destroyed by insects as soon as they came through the ground. The land was treated with poisoned Bordeaux, which killed the cutworms. It was then sown a second time and the plants were sprayed twice a week with poisoned Bordeaux without any apparent effect. (See cucumbers.) The average yields of all varieties of pumpkins grown, up to 1922, are shown in the following table:—

PUMPKINS—AVERAGE YIELDS

Variety	Number of years grown	Average yield per acre	
		tons	lbs.
Large Field	1	59	1,911
King of Mammoth	3	36	1,043
Connecticut Field	3	30	359
Small Sugar	3	27	1,879
Winter Luxury	2	20	624
Large Cheese	2	12	356

SALSIFY

Two varieties were sown on the 22nd of May. Long White (Ewing) yielded at the rate of 4 tons 1,108 pounds per acre and Mammoth Sandwich Island (Rennie) yielded 2 tons 1,016 pounds.

SQUASH

Six varieties of squash were sown on the 26th of May. They were destroyed by insects. A second planting on June 16 was also destroyed. (See cucumbers.)

VARIETY TEST OF TOMATOES

Nineteen varieties of tomatoes were sown in the hot-bed on the 13th of April. They were transplanted in the hot-bed on May 5. On June 9 they were transplanted into the field. The rows were 2½ feet apart, and the plants were set 2 feet apart in the rows. The tomato vines were trimmed to two stems. The yields, which were computed from the yield on 1/528 of an acre, are shown in the following table:—

TOMATOES—TEST OF VARIETIES

Variety	Source	Ripe		Green		Total	
		tons	lbs.	tons	lbs.	tons	lbs.
Chalk Jewel, Ottawa—710	Ottawa	22	768	8	368	30	1,136
Alacrity, Ottawa—18-15-29	Ottawa	16	472	7	1,840	24	312
Northern Adirondack	Langdon	15	624	8	896	23	1,520
Prosperity	Bolgiano	14	874	4	1,240	19	114
Langdon Earliana	Langdon	14	843	3	1,656	18	498
Crimson Canner Ottawa—707	Ottawa	13	1,357	15	96	28	1,453
Burbank Early, Ottawa—1717	Ottawa	13	862	8	368	21	1,230
Matchless	Graham	11	1,595			11	1,595
Red Head	Langdon	11	770	8	896	19	1,666
Danish Export, Ottawa—1862-73	Ottawa	11	341	14	248	25	589
Victoria Whole Salad	Burpee	10	196	16	1,792	26	1,988
Ponderosa	Ewing	9	1,932	11	1,232	21	1,164
Bonny Best	Carter	9	942	12	816	21	1,758
John Baer	Carter	8	302	10	1,384	18	1,686
Acme	Ewing	8	203	13	1,984	22	187

TOMATOES—AVERAGE YIELD PER ACRE

Variety	Source	Number years grown	Ripe		Green		Total	
			tons	lbs.	tons	lbs.	tons	lbs.
Chalk Jewel, Ottawa—710	Ottawa	2	15	262·5	16	1,924	32	186
Alacrity, Ottawa—18-15-29	Ottawa	1	16	472	7	1,840	24	312
Northern Adirondack	Langdon	3	7	1,653	9	525	17	178
Prosperity	Bolgiano	7	5	1,604	5	1,195	11	799
Langdon Earliana	Langdon	3	5	1,390	6	1,992	12	1,382
Crimson Canner, Ottawa, 707	Ottawa	2	9	216	17	848	26	1,064
Burbank Early, Ottawa—1717	Ottawa	1	13	862	8	368	21	1,230
Matchless	Graham	6	5	405	6	1,851	12	256
Red Head	Langdon	3	7	359	14	72	21	431
Danish Export, Ottawa—1862-73	Ottawa	1	11	341	14	248	25	589
Victoria Whole Salad	Burpee	3	5	66	22	1,144	27	1,210
Ponderosa	Ewing	5	6	1,179	8	1,311	15	490
Bonny Best	Carter	5	5	87	9	12	14	100
John Baer	Carter	3	3	259	16	43	19	302
Acme	Ewing	3	2	1,401	13	1,588	16	989

TOMATO PRUNING EXPERIMENT

With a view to determining whether tomatoes pruned to one stem or pruned to two stems would give the greatest yield of ripe fruit, nineteen varieties were planted in duplicate on the 9th of June. They were planted in rows 2½ feet apart and 2 feet between plants. The plots were 1/528 of an acre. Both ranges of plots received the same fertilizer and cultivation, but in one range the vines were pruned to one stem, and in the other range to two stems. The average yields are shown in the following table:—

TOMATOES—AVERAGE YIELD PER ACRE FOR NINETEEN VARIETIES

Treatment	Ripe		Green		Total		Per cent ripened
	tons	lbs.	tons	lbs.	tons	lbs.	
Pruned to 2 stems	12	842	10	1,259	23	101	53·8
Pruned to 1 stem	11	1,475	6	227	17	1,702	65·8
Increase		1,367	4	1,032	5	399	

Deductions

I. Tomatoes pruned to two stems will give the greater yield of ripe fruit, and total yield.

II. Pruning tomatoes, however, is not practical commercially, as the cost of pruning makes the price of the fruit too high. It is valuable for a farmer who wishes to ripen a few tomatoes for his own use, however, as a larger percentage of the fruit will ripen when pruned, especially in a wet and backward season.

POTATOES

The yields of potatoes throughout the province were below average. The heavy rains in May and June destroyed the vitality of the seed so that the stands were poor, and even where good stands were secured, the plants were low in vitality, with a low degree of resistance to insect and fungous disease. The persistent wet weather during the growing season made spraying difficult and favoured the spread of fungous disease.

SEED

The seed was cut from carefully selected potatoes, and all off-type and diseased tubers were rejected. Before cutting, the tubers were put in a formalin solution for two hours to destroy scab. (The formalin solution consisted of one pint of formaldehyde to thirty gallons of water.) Two-ounce sets were cut when possible.

SOIL

The potatoes were grown on a medium clay loam of average fertility. The land used in potato experiments was very uniform as to slope and character of soil, and was all clover sod manured in the spring at the rate of 15 tons of barnyard manure per acre.

CULTIVATION

When the potatoes were planted on land which had been in hoed crop or grain the previous year, it was spring ploughed and harrowed. When they were planted on land which was in hay or pasture the previous year, the land was ploughed in the early autumn, ploughed again in the spring, and harrowed. The object in both cases was to get a good, deep seed bed. Potatoes were planted in shallow drills, 30 inches apart and 12 inches between sets, with a Robbin potato planter. They were alternately ridged with the horse hoe, and cultivated (the first ridging being given as plants broke ground) during the growing season. When the tops became too large for cultivation they were ridged up rather high, the object being to have the tubers well covered with earth to protect them from the fall frosts.

WORK

The experimental work with potatoes for the season included: (1) spraying and dusting experiments, (2) variety tests, (3) comparison of mature and immature seed, (4) experiments *re* dates of planting, (5) experiment on distance between rows, (6) cultivation experiment, (7) experiment on large versus small potatoes for seed purposes.

SPRAYING

All fields of potatoes, except those used for spraying vs. dusting experiments, were sprayed with poisoned Bordeaux when the tops were 6 inches high, and at ten-day intervals thereafter, weather permitting, until a total of five

sprays was applied. The actual time between the first and last spray was forty-two days. At the end of the last spray the tops were too large for further spraying. A 4-4-40 mixture was used for the first two sprays, a 5-5-40 mixture was used for the third spray, and a 6-6-40 mixture was used for the last two sprays. The poison used was white arsenic, mixed in the manner recommended by the Entomological Branch of the Federal Department of Agriculture, and was very effective. It killed the potato beetle and did not affect the foliage.

Preparation of Spray

Ten gallons of the mixture of hydrated lime and white arsenic, sold on the market as the D.E.L. mixture, can be made by sifting a mixture, consisting of one pound of hydrated lime and one pound of superfine white arsenic, into a barrel containing ten gallons of water. When this solution has been thoroughly agitated, a sack containing ten pounds of crystal copper sulphate is suspended in it and stirred occasionally until all the copper sulphate dissolves. This is a stock solution and must be made at least twenty-four hours before it can be used, but, when made, will keep indefinitely. This solution has the same strength and is used in exactly the same manner as the ordinary stock solution of copper sulphate, except that it should be stirred each time before using. The stock solution of lime is made in the usual manner. Poisoned Bordeaux, made in this manner is green in colour and is as effective and much cheaper than ordinary poisoned Bordeaux.

Dusting and Spraying Experiment

In order to determine the value of poisoned Bordeaux dust for the control of insects and blight, a spraying and dusting experiment was conducted in co-operation with the Entomological Branch. This experiment was conducted on .785 of an acre of Dreer Standard potatoes. The poisoned Bordeaux liquid was made as explained in the preceding paragraph, and was applied on the following dates:—

July 14	4-4-40	Aug. 9	6-6-40
" 21	4-4-40	" 14	6-6-40
" 26	5-5-40	" 25	6-6-40

The dust was mixed at this Station, and a total of five sprays was applied. A mixture of 12 per cent dehydrated copper sulphate, 10 per cent arsenate of lime and 78 per cent hydrated lime, was applied on the 15th and 26th of July and 3rd of August and a mixture consisting of 12 per cent dehydrated copper, 8 per cent arsenate of lime and 80 per cent hydrated lime, was applied on the 14th and 30th of August. The dust was applied in either the morning or evening with a power-driven duster. The feed gauge of the dust hopper was too coarse, and allowed an excess of material to be distributed. This made the cost of dusting much higher than spraying. The results are as follows.

AVERAGE YIELD PER ACRE

—	Marketable	Small	Total
	bush.	bush.	bush.
Sprayed	260·9	22·9	283·8
Dusted	249·9	22·9	272·8
Check	228·2	19·8	248·0

No rot was in evidence on any of the plots at time of digging but the check plot died down earlier than the other plots, which were green until frost.

YIELDS OF POTATOES GROWN COMMERCIALLY

The following is the yield per acre of all potatoes grown commercially at this station during the year. These potatoes were grown on different sized fields and on variable soil, so the yields per acre are not indicative of the relative values of the varieties used.

YIELD PER ACRE

—	Marketable	Small	Total
	bush.	bush.	bush.
Irish Cobbler	116·1	13·0	129·1
Early Puritan	98·6	19·3	117·9
S 5727	107·5	9·6	117·1
Garnet Chili	113·3	3·1	116·4
Fredericton Green Mountain	101·0	11·5	112·5
Acadia	102·5	9·0	111·5
Green Mountain	97·9	12·8	110·7
Dreer Standard	91·5	8·2	99·7
Burbank	87·4	6·4	93·8
Empire State	86·4	5·5	91·9
Bliss Triumph	76·7	9·5	86·2
Eureka Extra Early	59·6	15·4	75·0
Black Kidney	10·7	.....	10·7

VARIETY TEST OF POTATOES

The varieties listed below were planted on the 24th of May in 1/264 acre plots. The soil was a medium clay loam with a south slope, and grew a crop of clover the previous year. It was prepared by fall ploughing, spring ploughing and thorough discing and harrowing. Barnyard manure at the rate of 15 tons per acre was applied early in the spring, and 600 pounds of 4-8-6 home-mixed fertilizer was applied at the time of planting.

The crop presented a very poor appearance during the growing season. The majority of the varieties lacked vigorous foliage and were badly infected with mosaic. Leaf roll was also apparent in a severe form in several of the varieties. Owing to mosaic infection, the variety test will be discontinued at the end of the present season.

Variety	Source	Marketable	Small	Total	Number of years grown	Average yield
		bush.	bush.	bush.		bush.
Piermont Seedling	Ottawa	514·8	57·2	572·0	10	332·1
Seedling Hoben	Hoben	422·4	13·2	535·6	2	463·6
Rutledge Favourite	Rutledge	490·6	37·4	528·0	2	539·0
American Wonder	Ottawa	442·2	13·2	455·4	10	332·5
Acadia	Burbank Selection	415·8	37·4	453·2	4	404·8
Rural New Yorker	Charlottetown	448·8	.....	448·8	10	354·0
Sir Walter Raleigh	Ottawa	411·4	13·2	424·6	10	368·4
Green Mountain	Fraser	376·2	36·2	412·4	3	424·2
Eureka Extra Early	Ottawa	315·7	95·7	411·4	10	385·4
Wee McGregor	Ottawa	369·6	30·8	400·4	6	268·8
Irish Cobbler	Fawcett	312·4	81·4	393·8	3	385·0
Green Mountain	McCain	369·6	22·0	391·6	2	462·0
Black Kidney	Baribeau	378·4	13·2	391·6	3	326·3
Green Mountain Jr	Ottawa	319·0	70·4	389·4	4	245·7
Carman No. 3	Ottawa	376·2	6·6	382·8	10	357·6
Burpee Extra Early	Ottawa	349·8	26·4	376·2	10	320·9
Kerrs Pink Ottawa—916–17	Ottawa	299·2	66·0	365·2	2	345·4
Early White Albino	Ottawa	323·4	39·6	363·0	10	382·8
Bliss Triumph	Grand Falls	319·0	35·2	354·2	3	367·4
Dreer Standard	Indian Head	325·6	22·0	347·6	10	415·6
Whitney No. 1	St. Stephen	255·2	88·0	343·2	7	249·7
S 13660	Washington	305·8	35·2	341·0	7	284·3
S 5727	Washington	277·2	61·6	338·8	7	231·0
Majestic Ottawa—915	Ottawa	277·2	61·6	338·8	2	303·6
Money Maker	Indian Head	316·8	15·4	332·2	10	372·7
Table Talk	Charlottetown	290·4	35·2	325·6	10	330·3
Carman No. 1	Indian Head	308·0	13·2	321·2	10	326·8
Reeves Rose	Indian Head	290·4	24·2	314·6	7	344·3
Morgan Pink Seedling	Ottawa	279·4	35·2	314·6	10	383·4
Hayward Seedling	Hayward	233·2	79·2	312·4	2	299·2
Maggie Murphy	Ottawa	286·0	22·0	308·0	5	391·1
Green Mountain	Lowell	277·2	26·4	303·6	8	331·0
Factor	Ottawa	291·5	11·0	302·5	10	315·8
King George, Ottawa 923	Ottawa	250·8	44·0	294·8	2	279·4
Great Scott, Ottawa—918	Ottawa	184·8	101·2	286·0	2	242·0
Snow	Ottawa	257·4	26·4	283·8	10	320·3
Delaware	W. H. Moore	253·0	26·4	279·4	7	434·3
New Chieftain	Ottawa	257·4	17·6	275·0	10	360·3
Improved Burbank	Charlottetown	246·4	22·0	268·4	3	343·9
Early May	Ottawa	240·9	22·0	262·9	10	305·2
Markee	Fredericton	228·8	26·4	255·2	4	240·3
Green Mountain	W. H. Moore	233·2	22·0	255·2	10	385·4
Edzel Blue, Ottawa—919	Ottawa	176·0	74·8	250·8	2	224·4
Gold Coin	Charlottetown	233·2	15·4	248·6	10	318·2
Early Nebraska	Ottawa	215·6	22·0	237·6	10	341·9
Morgan Seedling	Charlottetown	215·6	11·0	226·6	10	355·1
Dalmeny Beauty	Indian Head	165·0	30·8	195·8	10	357·6
Empire State	Indian Head	154·0	30·8	184·8	10	329·2
Langworthy	Ottawa	154·0	17·6	171·6	10	383·2
Black Kidney	Loch Lomond	151·8	19·8	171·6	4	169·4
Early Hebron	Ottawa	103·4	26·4	129·8	9	309·4
Barnhouse Beauty, Ottawa 922	Ottawa	48·4	39·6	88·0	2	154·0

MATURE VERSUS IMMATURE SEED

On May 31, 1921, thirty-nine of the varieties of potatoes in the variety test were planted in duplicate in 1/264 acre plots. The conditions as to land, fertilizer and treatment, were identical for both plantings, but the seed for one planting was cut from mature potatoes while the seed for the other planting was cut from immature potatoes obtained from a planting made on June 28 of the previous year.

The experiment was repeated in 1922 but the number of varieties used was reduced to four, two of which were early maturing varieties and two late matur-

ing. These were planted on the 24th of May. The immature seed was cut from potatoes grown from a June 21, 1921, planting of the immature seed used in that year's experiment. The yields were as follows:—

YIELD PER ACRE—MATURE VS IMMATURE SEED

Name of Variety	Character of seed	Marketable	Small	Total	Per cent marketable
		bush.	bush.	bush.	bush.
Bliss Triumph	Mature	319·0	35·2	354·2	90·0
Bliss Triumph	Immature	314·6	39·6	354·2	88·8
Irish Cobbler	Mature	312·4	81·4	393·8	79·3
Irish Cobbler	Immature	490·6	26·4	517·0	94·8
Improved Burbank	Mature	246·4	22·0	268·4	91·8
Improved Burbank	Immature	543·4	22·0	565·4	96·1
Morgan Pink Seedling	Mature	279·4	35·2	314·6	88·8
Morgan Pink Seedling	Immature	382·8	30·8	413·6	92·5

Summary

Four varieties of immature seed gave a net average increase of 129·8 bushels per acre.

Three varieties of immature seed gave an average increase of 173·06 bushels per acre.

Thirty-nine varieties of immature seed grown the previous year gave a net average increase of 34·3 bushels per acre.

Deductions:—

I. Immature seed will give the larger total yields.

II. Immature seed will give the larger yields of marketable potatoes.

SEASONABLE VERSUS LATE PLANTING

With a view to obtaining data on yields from seasonable planting as compared with late planting, duplicates of a number of the early and late maturing varieties in the variety test were planted on the 24th of June. These were planted on land adjacent to the variety test plots, and given the same manure and fertilizer as the variety plots. The yields from the different dates of planting are shown in the following table.

SEASONABLE VS. LATE PLANTING

Character of potatoes	Date of planting	Number of varieties	Average yield per acre			Per cent marketable
			Marketable	Small	Total	
			bush.	bush.	bush.	
Early Maturing	May 24	6	271·15	40·88	312·03	86·8
Early Maturing	June 24	6	224·43	47·66	272·10	82·4
Late Maturing	May 24	19	312·80	24·60	337·40	92·7
Late Maturing	June 24	19	180·28	38·67	218·95	82·3

Deductions

I. Seasonable planting will give the larger yield for both early and late maturing varieties.

II. Early maturing varieties are preferable for late planting.

POTATOES—A STUDY OF DISTANCE BETWEEN ROWS

An experiment on the distance apart of rows was begun, to determine the effect on yield and prevalence and development of physiological diseases. The land used for this experiment was similar to the land used in the variety test of potatoes, and received the same treatment. Four plots of Green Mountains of the Fraser strain were used in this experiment and they were planted as follows:—

Plots 1, 2, 3 and 4 were 2 feet, 2½ feet, 3 feet and 3½ feet apart respectively. The sets were 12 inches apart in the row. Cultural conditions were the same in each plot. The outside rows were discarded at time of digging.

POTATOES—DISTANCES BETWEEN ROWS

Variety	Distance between rows	Average yield per acre			Per cent mosaic	Per cent marketable
		Marketable	Small	Total		
	feet	bush.	bush.	bush.		
Green Mountain	2	321·7	13·6	335·3	10·0	95·9
"	2½	220·7	13·7	234·4	14·5	94·1
"	3	220·5	10·2	230·7	11·0	95·6
"	3½	189·5	13·3	202·8	20·0	93·4

Deductions

I. The greatest yield was obtained from rows planted 2 feet apart.

II. Distance between rows has no apparent effect on the prevalence of mosaic.

POTATOES—CULTIVATION EXPERIMENT

In order to determine the amount of cultivation necessary for growing a crop of potatoes, four plots of Green Mountain potatoes of the Fraser strain were planted in rows 2½ feet apart. Plot 1 was cultivated four times; plot 2, three times; plot 3, twice; and plot 4, once. The land used for this experiment was similar to the land in the variety test and was given the same treatment as to manure, fertilizer, ploughing and harrowing. The results are as follows:—

POTATOES—CULTIVATION EXPERIMENT

Plot No.	Number of times cultivated	Average yield per acre			Per cent marketable
		Marketable	Small	Total	
		bush.	bush.	bush.	
1	4	196·4	16·7	213·1	92·1
2	3	211·9	18·2	230·1	92·0
3	2	234·6	23·4	258·0	90·9
4	1	217·8	20·8	238·6	91·2

COMPARISON OF SMALL AND LARGE POTATOES FOR SEED PURPOSES

Small potatoes of the Green Mountain variety, Fraser strain, with 4 per cent mosaic rogued out in 1921, were planted in comparison with potatoes of the same strain, weighing about 8 ounces and of good Green Mountain type, the object being to determine the value of small potatoes (free from physiological disease) for seed purposes. Four plots were used in the experiment. In one

plot the small potatoes were cut in two. In the second plot the large potatoes were cut into sets weighing 2 ounces. In the third plot the small potatoes were planted whole and in the fourth plot the large potatoes were planted whole. The results were as follows:—

LARGE VS. SMALL SEED POTATOES

Size of potatoes	Treatment of seed	Average yield per acre			Per cent mosaic	Per cent marketable
		Marketable	Small	Total		
		bush.	bush.	bush.		
Small	Cut in two	372·5	39·0	411·5	10	90·5
Large	Cut in sets	345·3	20·7	366·0	14	94·3
Small	Planted whole	417·4	31·2	448·6	12	93·0
Large	Planted whole	391·1	50·0	441·1	16	88·6

Deductions

I. Small potatoes will give the larger total yield both when planted whole and cut into sets.

II. Whole potatoes will give larger yields than potatoes cut into sets.

CEREAL HUSBANDRY

The drought during the summer of 1921 left the soil in a very dry condition in the fall, and the ground froze early in November before the soil became thoroughly saturated. The winter snowfall was mostly removed by a heavy rain on the 8th of March and the water ran off the top of the land without going into the ground. As a consequence the land was dry and could be worked early in the spring of 1922. Frequent rains during the growing season promoted a heavy growth of straw. As the harvest season was wet, all the grain was more or less discoloured, and a number of the bean plots were spoiled by the wet weather.

ROTATION FOR VARIETY TEST

Since the establishment of the Station, a three-year rotation has been followed on the land set aside for the work with cereals. The rotation is as follows:—

First year.—Hoed crop, manured fifteen tons per acre, home-mixed fertilizer 600 to 800 pounds. (This is always a potato fertilizer and the proportions of different chemicals varied from year to year owing to the difficulty of obtaining potash. A 4-8-6 fertilizer was used this year on the hoed crop.)

Second year.—Grain, seeded down with six pounds timothy and ten pounds red clover. (This season two pounds of red clover has been replaced by two pounds of alsike.)

Third year.—Hay crop, ploughed in early autumn, ploughed again in spring, manured and put in hoed crop.

SOIL

The cereals were grown on soil which grew a crop of mangels and potatoes the previous year. During that season, fifteen tons of manure and 600 pounds

of home-mixed, 5-8-7 fertilizer, were applied. The land was prepared by spring ploughing and thorough harrowing. Except where otherwise stated, all the plots were one-sixtieth of an acre and in triplicate. The plots were carefully rogued during the summer, and again just previous to cutting. The plots were threshed, separated, and the yield per acre of each variety computed by taking an average of all the plots of that variety.

The experimental work for the season included the retesting of the varieties of spring cereals and winter wheats tested the previous year; also the testing of four new varieties of beans. Tests were also made of rates of seeding and dates of sowing Banner oats.

VARIETY TEST OF SPRING WHEAT

Six varieties of spring wheat were tested. A small amount of glume spot and loose smut were found, but no wheat scab was noted. The wheat was sown on May 11 at the rate of 120 pounds per acre.

SPRING WHEAT—TEST OF VARIETIES

Name of Variety	Date of ripening	Number of days maturing	Average length of straw including head	Strength of straw on a scale of 10 points	Actual Yield of grain per acre	Weight per measured bushel after cleaning
			inches		bush. lbs.	lbs.
Early Russian, Ottawa 40..	Aug. 26	107	39	7·0	26 30	62·0
Huron, Ottawa 3.....	" 30	111	42	10·0	25 10	61·0
Ruby, Ottawa 623.....	" 14	95	33	8·0	20 40	62·2
White Russian.....	" 30	111	37·3	9·16	20 30	59·0
Early Red Fife, Ottawa 16.	" 30	111	39·3	9·66	18 50	60·0
Marquis, Ottawa 15.....	" 23	104	39·5	10·0	18 50	62·6

VARIETY TEST OF OATS

Five varieties of oats were tested. A small amount of smut was present in the Liberty oats. These oats which are a hulless variety, appear to have very poor resistance to smut. The oats were sown on May 11, at the rate of 102 pounds per acre.

OATS—TEST OF VARIETIES

Name of Variety	Date of ripening	Number of days maturing	Average length of straw including head	Strength of straw on a scale of 10 points	Actual yield of grain per acre	Weight per measured bushel after cleaning
			inches		bush. lbs.	lbs.
Victory.....	Aug. 16	97	42·3	9·0	79 30	37·5
Gold Rain.....	" 14	94	46·3	9·0	78 38	38·0
Banner, Ottawa 49.....	" 14	95	42·0	9·0	77 2	36·2
Daubeney, Ottawa 47.....	" 8	89	37·0	7·3	56 16	34·6
Liberty, Ottawa 480.....	" 11	92	38·0	8·0	42 32	50·0

VARIETY TEST OF BARLEY

Eight varieties of barley were tested. Fair stands were secured on all plots. A small amount of scab was noted. The plots were sown on May 11 at the rate of 120 pounds per acre.

BARLEY—TEST OF VARIETIES

Name of Variety	Date of ripening	Number of days maturing	Average length of straw including head	Strength of straw on a scale of 10 points	Actual yield of grain per acre	Weight per measured bushel after cleaning
			inches		bush. lbs.	lbs.
Charlottetown No. 80	Aug. 16	97	35·6	9·0	43 20	53·0
O.A.C. 21	" 13	94	37·0	9·0	41 44	51·0
Early Chevalier, Ottawa 51	" 10	91	40·3	8·5	40 24	52·2
Stella, Ottawa 58	" 12	93	39·3	9·6	37 46	48·2
Chinese, Ottawa 60	" 12	93	38·0	10·0	33 46	49·0
Gold	" 18	99	36·0	8·6	32 44	53·2
Himalayan Ottawa 59	" 14	95	24·3	8·0	28 16	61·2
Duckbill, Ottawa 57	" 18	99	38·6	9·3	22 16	51·2

VARIETY TEST OF PEAS

Four varieties of peas were tested. Good stands were secured, but owing to wet weather they were harvested in rather poor condition, and one plot of Mackay peas was completely spoiled. The plots were sown on May 11 at the rate of 120 pounds per acre.

PEAS—TEST OF VARIETIES

Name of Variety	Date of ripening	Number of days maturing	Average length of straw	Average length of pod	Actual yield of grain per acre	Weight per measured bushel after cleaning
			inches	inches	bush. lbs.	lbs.
Mackay, Ottawa 25	Aug. 30	111	43·3	2·0	36 15	62·8
Arthur, Ottawa 18	" 25	106	36·0	2·16	35 8	63·2
Canadian Beauty	" 30	111	41·3	2·33	29 50	63·2
Prussian Blue	" 25	106	44·6	2·41	25 10	61·2

VARIETY TEST OF BEANS

Five varieties of beans were retested and four additional varieties, namely, Soldier, White Pea, Yellow Eye (Kentville) and White Marrowfat, were tested for the first time. They were sown on June 6 at the rate of sixty pounds per acre. Owing to destruction by cutworms part of the plot seeded to Beauty, Yellow Eye, White Marrowfat, Carleton and Large White were reseeded on June 23.

BEANS—TEST OF VARIETIES

Name of Variety	Date of ripening	Number of days maturing	Average length of plants	Actual yield of seed per acre	Weight per measured bushel after cleaning
			inches	bush. lbs.	lbs.
Navy-Ottawa 711	Sept. 27	114	20·3	42	66·5
Norwegian-Ottawa 710	" 27	114	13·5	35 40	64·0
Soldier	" 27	114	19·0	34 15	63·5
White Pea	" 27	114	23·6	29 10	64·0
Beauty-Ottawa 712	" 27	114	16·2	26 30	66·5
Yellow Eye-Kentville	" 27	114	19·5	20	66·0
White Marrowfat	" 27	114	17·0	19 45	65·8
Carleton-Ottawa 718	" 16	103	17·0	16 10	63·8
Large White-Ottawa 713	" 27	114	19·0	13 45	Spoiled

FALL GRAINS

In August, 1921, ten acres of one year old clover sod were ploughed, rolled thoroughly, harrowed and sown to fall grains. The work with fall grains included, (1) retesting of all varieties of fall wheat, (2) testing of fall rye, and (3) the growing of five acres of commercial fall wheat. Owing to drought, the seed germinated rather poorly, but made fair growth by fall. It winter-killed rather badly, however, the commercial winter wheat being so badly injured that this plot was ploughed under in the spring. The test plots both of winter wheat and winter rye were harvested, but owing to the poor stand the yields were rather low.

VARIETY TEST OF WINTER WHEAT

Six varieties of winter wheat were tested this year. They were sown on August 31, in one-fourth acre plots, at the rate of 120 pounds per acre. The land was very dry, but, owing to seasonable rains, the wheat germinated well and made good growth during the fall. Owing to winter-killing the stand was rather uneven. The grain was cut on August 10. The following table shows the 1922 yield, and the average yield per acre.

WINTER WHEAT—TEST OF VARIETIES

Variety	Yield per acre–1922		No. of years grown	Average yield per acre	
	bush.	lbs.		bush.	lbs.
Dawson Golden Chaff	17	20	2	23	40
O.A.C.	17	0	2	27	15
Turkey Red	15	4	2	20	2
Early Red Clawson	12	48	2	21	9
Imperial Red Amber	12	0	2	23	37
American Banner	8	36	2	19	48

VARIETY TEST OF FALL RYE

Two varieties of fall rye were tested. The land was very uniform. The plots were sown on September 1, at the rate of two bushels per acre. The rye was cut on August 31. The following table shows the yield per acre.

FALL RYE—TEST OF VARIETIES

Varieties	Size of plots	Yield per acre	
	acres	bush.	lbs.
Rosen	0·9	19	47
Fredericton	2·13	16	6

The following table shows the average yields of the varieties of wheat, oats, barley, peas and beans grown at the Fredericton Station:—

WHEAT

Variety	Number of years grown	Average yield per acre	
		bush.	lbs.
Early Russian, Ottawa 40	4	25	5
White Russian	4	21	57
Huron, Ottawa 3	8	20	31
Early Red Fife, Ottawa 16	8	20	8
Ruby, Ottawa 623	5	18	37
Marquis, Ottawa 15	8	17	12
Red Fife, Ottawa 17	6	17	4
Prelude, Ottawa 135	5	14	6

OATS

Variety	Number of years grown	Average yield per acre	
		bush.	lbs.
Gold Rain	2	63	31
Victory	8	51	20
Banner, Ottawa 49	8	46	30
Eighty Day, Ottawa 42	4	41	17
Ligowo	5	39	33
Daubeney, Ottawa 47	8	37	29
Liberty, Ottawa 480	4	38	31

BARLEY

Variety	Number of years grown	Average yield per acre	
		bush.	lbs.
Charlottetown No. 80	2	39	10
Chinese, Ottawa 60	2	35	33
Early Chevalier, Ottawa 51	7	31	4
O.A.C. No. 21	8	31	26
Stella, Ottawa 58	5	33	
Gold	7	27	10
Duckbill, Ottawa 57	4	28	6
Manchurian, Ottawa 50	4	23	43
Himalayan, Ottawa 59	2	26	2
Canadian Thorpe	3	19	47

PEAS

Variety	Number of years grown	Average yield per acre	
		bush.	lbs.
MacKay, Ottawa 25	2	30	57
White Marrowfat	1	24	0
Arthur, Ottawa 18	5	19	56
Canadian Beauty	4	17	47
Prussian Blue	5	17	19
Golden Vine	1	15	7
Brittany	2	10	32

BEANS

Variety	Number of years grown	Average yield per acre	
		bush.	lbs.
Soldier	1	34	15
White Pea	1	29	10
Navy, Ottawa 711	2	28	37
Norwegian, Ottawa 710	2	26	40
Beauty, Ottawa 712	2	20	
Yellow Eye, Kentville	1	20	
White Marrowfat	1	19	45
Large White, Ottawa 713	2	15	57
Carleton, Ottawa 718	2	14	35

OATS—RATES OF SEEDING

In order to ascertain the rate of seeding which will give the largest yield of grain and straw, under New Brunswick conditions, one-eightieth acre plots

were sown in duplicate with Banner oats on May 30, at the rate of two and one-half to three and one-half bushels per acre. The yields of grain and straw are shown in the following table:—

Rate of seeding	Yield of grain per acre		Yield of straw per acre	
bush.	bush.	lbs.	tons	lbs.
2½	41	26	2	980
3	60	20	2	500
3½	58	28	4	80

OATS—DATES OF SEEDING

An experiment on dates of seeding was begun in the spring of 1922, the object being to ascertain which date for seeding oats will give the maximum yield, first, of grain and second, of straw, under New Brunswick conditions. Banner oats were sown on land used for cereal variety tests, on one-sixtieth acre plots, at the rate of 102 pounds per acre, on three different dates. The yields and dates of seeding are shown in the following table:—

Date of seeding	Rate of seeding per acre	Yield of grain per acre		Yield of straw per acre	
	bush.	bush.	lbs.	tons	lbs.
May 11	3·5	71	16	3	360
May 23	3·5	57	12	2	1,430
June 5	3·5	45	30	2	1,580

FORAGE CROPS

The drought of the previous year left the land in a dry condition. It was, therefore, easy to prepare the land for crops. There was very little growth before May 15, but from that date the frequent rains made growth very rapid. Unfortunately the land on which the variety tests of corn, sunflowers, turnips, mangels, sugar beets and carrots were grown was under water from June 18 to June 24. The plots never fully recovered from this immersion, so the yields obtained this year are very low, and as some parts of the field were affected by the flood more than other parts, the results obtained are by no means conclusive.

WORK

The forage crop work for the season included: (1) the testing of the productiveness and suitability of different varieties of Indian corn, sunflowers and field roots for this district, (2) the production of swede turnip seed in connection with the improvement of a strain of Kangaroo, (3) the carrying on of a series of tests of clover and grass mixtures, (4) the testing of different methods of growing alfalfa, (5) the inauguration of a series of experiments with sweet clover, and (6) the inauguration of a series of tests of clover seed from different sources.

SOIL

The land on which the variety tests of Indian corn, sunflowers and field roots were made was fall ploughed and had been in hoed crop the previous year.

During that spring it was given an application of fifteen tons of manure per acre. In the spring of 1922 it was thoroughly harrowed and received an application of 1,500 pounds of 4-8-5 home-mixed fertilizer per acre.

VARIETY TEST OF CORN

Eleven varieties of corn were sown on the 2nd of June in one-fiftieth acre plots. They were cut on September 23, but as they were under water from the 18th to the 24th of June and never fully recovered from this flooding, the yield was by no means conclusive.

INDIAN CORN—TEST OF VARIETIES

Variety	Yield per acre—1922		Per cent stand 1922	Number of years grown
	tons	lbs.		
Leaming	14	1,750	88·0	4
Golden Glow	14	750	86·9	5
North Western Dent	11	1,000	88·0	3
Longfellow	10	750	88·0	3
North Dakota	9	250	90·4	2
White Cap Yellow Dent	7	250	83·3	6
Compton Early	5	1,250	93·6	5
Wisconsin No. 7	5	750	88·8	5
Twitchell Pride	5	750	95·2	2
Quebec No. 28	4	1,250	97·6	4
Bailey		1,500	89·2	5

VARIETY TEST OF SWEDE TURNIPS

Eleven varieties of swede turnips were sown on May 24. This land was under water from the 18th to the 24th of June and this, no doubt, decreased the yield. The turnips were pulled on October 27. The decrease in the per cent stand was wholly caused by club root, and as the Bangholm variety was not affected, it would seem that this variety is resistant to club root.

SWEDE TURNIPS—TEST OF VARIETIES

Variety	Source	Yield per acre, 1922		Per cent stand	Number of years grown, 1922 neglected
		tons	lb.		
Monarch	E. F. Nappan	20	1,400	70	3
Derby Bronze Top	Ontario Seed Co	20	1,400	79	2
Kangaroo	D. M. Ferry	19	1,050	87	3
Kangaroo	Fredericton	18	1,850	78	1
Good Luck	E. F. St. Anne	18	1,200	88	0
Sutton Champion	Fredericton	18	700	89	3
Good Luck	E. F. Fredericton	18	100	79	3
Hall Westbury	W. M. Ewing	16	200	75	3
Jumbo	D. M. Ferry	15	1,850	80	2
Bangholm	E. F. Charlottetown	15	1,700	100	1
Ditmar Swede	R. V. Ditmar	15	1,500	71	2

VARIETY TEST OF MANGELS

Five varieties of mangels were sown on May 23. They were all killed by the flood in June. After the water went down rape was seeded on this land.

VARIETY TEST OF CARROTS

Two varieties of carrots were sown in duplicate in 1/100 acre plots on May 24. They were pulled on October 30. The varieties, yield and source of seed were as follows:—

CARROTS—TEST OF VARIETIES

Variety	Source	Yield per acre, 1922	Number of years grown	Average yield for years grown
		tons lbs.		tons lb.
Chantenay Intermediate	Rennie	7 1,142	2	8 1,636
Danish Champion	E. F. Ottawa.	7 769	2	8 1,778

VARIETY TEST OF SUGAR BEETS

Six varieties of sugar beets were sown in duplicate in 1/100 acre plots on May 23. One range of plots was completely destroyed by the flood in June. The other range was checked, but made a fair recovery. They were pulled on October 19.

SUGAR BEETS—TEST OF VARIETIES

Variety	Yield per acre, 1922	Per cent stand	Number of years grown	Average yield
	tons lb.			tons lb.
British Columbia E. F. (Sydney)	11 1,012	100	4	12 1,340
Danish Seed (Dominion Sugar Co)	10 995	100	1	10 995
Waterloo (Dominion Sugar Co.)	10 575	100	3	13 289
British Columbia (Dominion Sugar Co.)	8 1,607	90	1	8 1,607
Vilmorins Improved (Vilmorins, Paris, France)	8 1,602	70	3	10 88
Chatham (Dominion Sugar Co.)	8 201	80	4	12 1,697

SWEDE TURNIPS FOR SEED

One hundred and twenty-seven Kangaroo turnips were planted on the 1st of May. These produced 8¼ pounds of cleaned seed, or at the rate of 600 pounds per acre. Cost of production was 57 cents per pound.

VARIETY TEST OF SUNFLOWERS

Five varieties of sunflowers were sown on the 2nd of June on 1/50 acre plots. They were cut on September 7, but as they were under water from the 18th to the 24th of June the results obtained were by no means conclusive. Results are shown in the following table:—

SUNFLOWERS—TEST OF VARIETIES

Variety	Source	Yield	Per cent stand
		tons lb.	
Mammoth Russian	Dakota Improved Seed Co.	16 1,750	98·0
Mammoth Russian	McDonald	14 1,250	95·2
Early Ottawa	Ottawa	5 1,250	93·2
Mixed Mennonite	Rosthern	4 1,500	92·8
Mammoth Russian	Ottawa	3 250	88·0

AN EXPERIMENT WITH GRASSES AND CLOVER

In order to study different mixtures of grasses and clover, and to determine what combinations of these are best adapted to New Brunswick, twenty-four 1/40 acre plots were sown in duplicate, (1) with grasses alone, (2) in combination with red clover, (3) in combination with alsike clover and (4) in combination with red clover and alsike clover, on June 10, 1921. They were sown without a nurse crop. Although the weather was extremely dry and the germination slow, very good stands were secured. They came through the winter in extra good condition. The weather was favourable to growth, and the plots grew well. They were cut twice, the first cutting being on June 7, at which date the timothy and meadow fescue were in full bloom. The orchard grass was too mature, and the red and alsike clovers were one-third turned. This cutting was housed on the 10th of June in a very dry condition. They were cut again on September 8, and housed on September 11. The first cutting was housed without any rain. The second cutting received a slight shower on September 9. The rate and combination of seeding and yields are shown in the following table.

GRASSES AND CLOVERS—TEST OF MIXTURES

Plot No.	Rate of Seeding per Acre					Yield per Acre		
	Alsike Clover	Red Clover	Timothy	Meadow Fescue	Orchard Grass	1st Cutting	2nd Cutting	Total
	lbs.	lb.	lb.	lb.	lb.	tons lb.	tons lb.	tons lb.
13	2	8	8			2 1,680	2 40	4 1,720
7	6		8			2 1,940	1 1,500	4 1,440
16	2	8	6	10		3 300	1 580	4 880
17	2	8	6		10	2 1,360	1 670	4 30
18	2	8		10	10	2 1,160	1 380	3 1,540
15	2	8			15	2 840	1 620	3 1,460
14	2	8		15		2 1,280	- 1,870	3 1,150
1		10	8			2 860	1 80	3 940
4		10	6	10		2 700	- 1,560	3 260
19			12			2 1,280	- 930	3 210
5		10	6		10	1 1,820	1 210	3 30
6		10		10	10	1 1,860	1 30	2 1,890
10	6		6	10		2 1,140	- 650	2 1,790
9	6				15	2 1,100	- 660	2 1,760
12	6			10	10	2 540	- 1,060	2 1,600
2		10		15		1 1,760	- 1,640	2 1,400
11	6		6		10	1 1,900	- 1,280	2 1,180
3		10			15	1 960	1 20	2 980
8	6			15		1 1,640	- 1,070	2 710
22			8	15		1 1,740	- 760	2 500
24				15	15	1 1,220	- 980	2 200
20				30		1 1,000	- 640	1 1,640
21					30	1 280	- 1,200	1 1,480
23			8		15	1 480	- 930	1 1,410

Deductions

I. Generally speaking, timothy in combination with clovers gave the best yield.

II. The addition of meadow fescue and orchard grass to the mixture did not increase the yield as the timothy when grown in any combination with either orchard grass or meadow fescue, was crowded out by these grasses. Thus timothy made bottom but did not mature when grown with either orchard grass or meadow fescue, and the same was true of orchard grass when grown with meadow fescue.

EXPERIMENTS IN GROWING ALFALFA

In order to get accurate data on the effect on alfalfa of lime, nurse crops, rate and method of seeding, twelve 1/40 acre plots were sown in duplicate on

July 15, 1921. The nurse crop used was barley, at the rate of one bushel per acre. The limed plots had an application of 6,000 pounds of ground limestone per acre in the spring of 1921. The alfalfa came through the winter in good condition. The plots with nurse crops were rather backward in the spring, but they made a good recovery. No difference was noted between the limed and unlimed alfalfa in the spring, but the limed plots made more vigorous growth and matured sooner. The alfalfa was cut on June 26, August 10 and September 18. The results are shown in the following table.

ALFALFA EXERIMENTS

Method of Seeding	With or without nurse crop	Limed or unlimed	Rate of seeding per acre	Yield per Acre							
				1st cutting		2nd cutting		3rd cutting		Total	
			lb.	tons	lb.	tons	lb.	tons	lb.	ton	lb.
Broadcast	Without	Limed	20	3	920	1	1,240	0	1,800	5	1,960
"	"	Unlimed	20	3	740	1	760	0	1,500	5	1,000
12-inch rows	"	Limed	10	3	300	1	940	0	1,600	5	840
Broadcast	With	Unlimed	20	2	1,860	1	940	0	1,900	5	700
"	"	Limed	20	2	1,780	1	860	0	1,500	5	140
12-inch rows	Without	Unlimed	10	3	100	1	640	0	1,400	5	140
24-inch rows	"	"	5	2	1,620	1	600	0	1,300	4	1,520
12-inch rows	With	"	10	2	780	1	820	0	1,600	4	1,200
24-inch rows	Without	Limed	5	2	1,100	1	560	0	1,300	4	960
12-inch rows	With	"	10	2	760	1	400	0	1,300	4	460
24-inch rows	"	Unlimed	5	1	960	1	140	0	1,900	3	1,000
24-inch rows	"	Limed	5	1	1,500	1	180	0	1,000	3	680

Deductions

I. Generally speaking, the limed and unlimed plots gave equal yields.

II. Plots without nurse crop gave better yields than those with nurse crop.

III. Broadcast seeding gave best yields, the 12-inch rows were second, and the 24-inch rows were much inferior.

A duplicate of this experiment was sown on June 26, 1922, in 1/50 acre plots.

THE EFFECT OF LIME ON ALFALFA

In order to study the effect of lime on alfalfa, the yields of the twelve limed plots were averaged against the twelve unlimed plots. The results are as follows:—

	Yield per acre							
	1st cutting		2nd cutting		3rd cutting		Total	
	tons	lb.	tons	lb.	tons	lb.	tons	lb.
Limed	2	1,393	1	696	0	1,416	4	1,506
Unlimed	2	1,343	1	650	0	1,600	4	1,593

CLOVER SEED PRODUCTION

Five plots, each one-fourth of an acre, were seeded to clover in order to determine, (1) the best method of seeding for seed production from first cutting, (2) which cutting will give the highest seed yield, (3) whether a hay or a seed crop will give the greater profit. The outline of the experiment is as follows:—

With Nurse Crop

1. Seeded broadcast, 10 pounds per acre (two cuttings for hay).
2. Seeded broadcast, 10 pounds per acre (first cutting for hay; second for seed.
3. Seeded broadcast, 10 pounds per acre (first crop for seed).

Without Nurse Crop

4. Seeded in rows 12 inches apart, 5 pounds per acre (first crop for seed).
5. Seeded in rows 24 inches apart, 2½ pounds per acre (first crop for seed).

The results are shown in the following table:—

CLOVER SEED PRODUCTION

Plot No.	Size of plot	Method of seeding	Rate of seeding per acre	Date of cutting	Value per Acre		Value of products
					Hay	Seed	
	acres		lb.		ton lb.	lb.	$ cts.
1	1/50	Broadcast	10	June 27	2 1,000		25 00
1	1/50	"	10	Sept. 8	1 1,700		18 50
2	1/50	"	10	June 27	2 1,000		25 00
2	1/50	"	10	Sept. 8		6·25	1 69
3	1/50	"	10	July 26		3·12	0 84
4	1/4	12-inch rows	5	July 26		10·00	2 70
5	1/4	24-inch rows	2·5	July 26		13 61	3 67

The value of the yields on the different plots was obtained by charging the hay at $10 per ton, and the clover seed at 27 cents per pound. These results are by no means conclusive as the season was so wet that the bumblebees could not fertilize the clover.

Deductions

I. Seeding in rows 24 inches apart gave the greatest production of seed from first cutting.

II. The second cutting of broadcast seeding gave the best yield of seed.

III. The hay crop gave the greater profit per acre.

AN EXPERIMENT WITH SWEET CLOVER

In order to compare the first-year hay crop (1) as to yield and, (2) as to quality, from biennial White Blossom Sweet Clover, biennial Yellow Blossom Sweet Clover and Hubam, these were grown in one-twentieth acre plots this season. The plots were seeded broadcast on May 30 at the rate of twenty pounds per acre. The yields are shown in the following table:—

Variety	Date of cutting	Yield per acre	
		tons	lb.
Hubam	Aug. 30	2	644
White Blossom Sweet Clover	Sept. 25	2	640
Yellow Blossom Sweet Clover	" 25	1	1,340

Deductions

I. While biennial White Blossom Sweet Clover and Hubam will give approximately the same yield, the quality of hay from the biennial variety is better, as it is not as woody as that from the Hubam.

II. The percentage of leaves on the Yellow Blossom Sweet Clover is much larger than on either the biennial White Blossom or the Hubam and consequently, although the yield is smaller, the quality of hay is much superior to that from the other two.

TEST OF CLOVER SEED FROM DIFFERENT SOURCES

In order to obtain data on the hardiness of clover seed from different sources, fifteen one-fiftieth acre plots were seeded. Seed was obtained from Sweden,

France, Italy, Ontario, and Quebec. The land on which these tests were made had been in hoed crop the previous year and, before seeding, the land was given an application of two tons of wood ashes per acre. Plots were sown on June 26, and, as the season was very favourable, excellent catches were secured.

NURSE CROP EXPERIMENT

In order to obtain data on the relative merits of barley, wheat and oats as nurse crops, the hay on plots which were devoted to cereal experiments was weighed separately. The average yields are shown in the following table:—

Nurse Crop	Yield of hay per acre	
	tons	lb.
Barley	2	1,500
Wheat	2	1,470
Oats	2	270

EXPERIMENTS WITH FERTILIZERS

The work at this Station, carried on in co-operation with the Division of Chemistry during the year, includes, (1) experimental work with complete fertilizers on a three-year rotation of potatoes, grain and hay, (2) an experiment to determine the best time to apply nitrate of soda to a potato crop. The season was very unfavourable for potatoes, as the wet condition of the land destroyed the vitality of the seed. The plants had to be sprayed continuously to keep down fungous diseases.

FERTILIZER EXPERIMENT WITH THREE-YEAR ROTATION

An experiment was begun with a view to finding out which fertilizer formula and rate of application would give the best yields in a three-year rotation of potatoes, grain and hay, under New Brunswick conditions. The land devoted to this experiment is a clay loam with a clay subsoil. It has been in two previous fertilizer experiments. Each of these experiments was a three-year rotation of potatoes, grain and clover with fertilizer applied to the potato crop. In May, 1916, half of each plot was given an application of waste lime at the rate of five thousand pounds per acre. In the fall of 1920, the clover sod was turned under and the land was manured in the spring at the rate of ten tons of barnyard manure per acre and planted to potatoes. In the spring of 1922, the land was spring ploughed and put into a fine state of tilth by means of the disc and spring tooth harrows. No manure was applied this year, but fertilizer was applied broadcast on each plot according to the formulae and at the rate per acre shown in the table below. The potatoes planted this year were Fraser strain Green Mountains. They had four per cent mosaic the previous year. Although this was carefully rogued out, the potatoes developed fifteen per cent mosaic this year, and a small amount of leaf roll was also noticed. The potatoes, both in 1921 and 1922, on the half of each plot which had been limed in 1916, were badly infected with scab. In the table, however, these scab-infected potatoes are classed as marketable as this condition of the potatoes is due to previous treatment and not to the application of fertilizer during the present season. Thirty plots in duplicate and eight checks were planted. The land was level and fairly uniform. The results are shown in the following table:—

FERTILIZER FORMULAE EXPERIMENT

Three year Rotation—1st year Potatoes; 2nd year Grain; 3rd year Hay; Record of Returns for the Potato Crop

Formulae of fertilizer	Rate of application per acre	Cost of fertilizer	Yield per Acre			Cost of increase per bush.
			Marketable	Small	Total	
	lb.	$ cts.	bush.	bush.	bush.	$ cts.
6-6-6	2,000	42 84	264 80	34·15	298·95	0·538
5-6-6	2,000	38 36	310·65	38·30	348·95	0·306
4-6-6	2,000	33 89	288·15	33·65	321·80	0·329
3-6-6	2,000	29 41	270·33	41·33	311·66	0·346
6-6-6	1,500	31 99	282·45	36·80	319·25	0·329
5-6-6	1,500	28 88	271·95	29·15	301·10	0·333
4-6-6	1,500	25 38	286·60	58·65	345·25	0·250
3-6-6	1,500	22 07	301·80	22·15	323·95	0·189
6-6-6	1,000	21 42	278·95	29·60	308·55	0·228
5-6-6	1,000	19 18	274·45	29·80	304·25	0·215
4-6-6	1,000	16 94	257·45	28·80	286·25	0·234
3-6-6	1,000	14 70	260·65	36·60	297·25	0·195
5-8-6	2,000	41 61	276·80	30·80	307·60	0·454
4-8-6	2,000	37 14	302·30	36·15	338·45	0·317
3-8-6	2,000	32 66	318·50	31·00	349·50	0·245
5-8-6	1,500	31 35	299·80	24·00	323·80	0·273
4-8-6	1,500	27 85	298·49	28·99	327·48	0·246
3-8-6	1,500	24 54	283·80	28·00	311·80	0·249
5-8-6	1,000	20 80	263·50	41·45	304·95	0·265
4-8-6	1,000	18 57	259·65	37·30	296·95	0·249
3-8-6	1,000	16 33	255·45	23·15	278·60	0·232
4-8-10	2,000	41 30	326·31	34·48	360·79	0·292
4-8-8	2,000	39 22	316·45	43·00	359·45	0·298
4-8-4	2,000	35 06	273·45	44·80	318·25	0·397
4-8-10	1,500	30 97	289·95	33·60	323·65	0·295
4-8-8	1,500	29 41	285·15	19·80	304·95	0·294
4-8-4	1,500	26 29	275·15	28·95	304·10	0·292
4-8-10	1,000	20 65	258·80	30·30	289·10	0·280
4-8-8	1,000	19 61	242·80	37·80	280·60	0·340
4-8-4	1,000	17 53	238·45	33·45	271·90	0·329
Average 8 checks	.....	.....	185·25	49·57	234·82	.....

Deductions

These results indicate that,—

I. When a fertilizer containing more than four per cent nitrogen is used on land in good tilth, the increased production is usually obtained at a greater cost than when one with four per cent is used.

II. A fertilizer containing eight per cent phosphoric acid will usually give better yields than one with six per cent.

III. Potash can be profitably used up to ten per cent.

IV. Heavy applications of fertilizer will usually give the largest, but not always the most profitable, yields.

NITROGEN EXPERIMENT

An experiment was conducted to find out (1) when nitrate of soda should be applied to give the best results, (2) what increase in yield would result from the use of phosphoric acid and potash without nitrogen. All the plots (except the check) were given an application of three hundred pounds of sixteen per cent superphosphate and one hundred and fifty pounds of fifty per cent muriate of potash, broadcast before seeding. The nitrate of soda was applied at the rate and time shown in the table. The land on which the nitrogen experiment was carried on was clay loam with a clay subsoil. In the spring of 1920, this land was given an application of barnyard manure at the rate of fifteen tons per acre and planted with potatoes. In 1921 it was seeded to clover and timothy, with

a nurse crop of oats. No fertilizer was applied that year. Owing to the drought, the grass and clover seed failed to catch and the land was ploughed in the fall. It was ploughed again in the spring of 1922 and put in good tilth with the disc and spring tooth harrows. No manure was applied this year. The plots were one-tenth of an acre each. The results are shown in the following table:—

NITRATE OF SODA APPLIED AT DIFFERENT TIMES TO THE POTATO CROP

No. of Plot	Cost of fertilizer	Nitrate of Soda (15½ N.) (Times of Application)			Yield per Acre			Cost of increase per bush.	Per cent marketable
		Planting	Appearance of crop	15 days later	Marketable	Small	Total		
	$ cts.	lbs.	lbs.	lbs.	bush.	bush.	bush.	$	
1		Check			183·50	70·33	253·83		72·3
2	21 00	330			319·83	47·33	367·16	0·154	87·1
3	21 00	220	110		300·33	57·33	357·66	0·179	83·9
4	21 00	110	110	110	302·83	45·16	348·00	0·175	87·0
5	21 00	110	220		282·00	46·50	328·50	0·213	85·9
6	21 00		220	110	301·16	40·00	341·16	0·178	88·2
7	7 80				270·83	45·66	316·50	0·089	85·5

N.B.—In these experiments, the fertilizers are charged at cost price.

All plots, excepting the check, received 300 pounds of superphosphate and 150 pounds of muriate of potash per acre.

Deductions

These results indicate that,—

I. Nitrate of soda gives the best results when applied at time of planting.

II. Application of phosphoric acid and potash alone greatly increases the yields.

III. The addition of nitrogen to make a complete fertilizer further increases the yields, although the increase over the check is obtained at a higher cost than when no nitrogen is used.

FIBRE DIVISION

FLAX

Two varieties of flax were grown at the Station this season. Two plantings were made of each variety, one being at the rate of one bushel per acre, and one at the rate of 1½ bushels per acre. The plots were one-sixteenth of an acre each, and were sown on the 6th of June. The land had been in a root crop the previous year, and had been given an application of barnyard manure at the rate of fifteen tons per acre, together with 800 pounds of a 5-8-7 home-mixed fertilizer. The land was prepared for the crop this year by spring ploughing and discing, after which the seed was sown broadcast. No manure or fertilizer was applied this year. The results are shown in the following table.

FIBRE FLAX—TEST OF VARIETIES

Variety	Rate of seeding per acre	Average height when pulled	Date pulled	Weight of dry straw per acre	Yield seed per acre	Remarks on growth
	bush.	inch.		lbs.	lbs.	
Blue Dutch	1	20	Aug. 30	2,736	288	Fair.
No. 5	1½	16	Sept. 7	3,104	144	Destroyed by cutworms. Reseeded June 24.
Blue Dutch	1	20	Sept. 6	4,208	480	Good.
No. 5	1½	20	Sept. 5	4,448	416	Good.

POULTRY

Excellent progress was made in the poultry plant during the year. The Candee incubator, which was again used for incubation purposes, gave better results than any year since it was installed. The brooders were thoroughly disinfected and removed to new ground, and in this way the high mortality of previous years was avoided. The young chickens made splendid growth during the summer. Up to the 1st of January, 1923, the three pens entered in the New Brunswick egg-laying contest by this Station were heading all other pens. This serves to illustrate the excellent condition of the birds, for which due credit must be given to Mr. S. L. Pearson, the poultryman, who has been unsparing in his efforts to improve the efficiency of the plant.

STOCK

The stock at the Station on December 31, 1922, consisted of 309 hens, 3 geese and 5 ducks, made up as follows:—

Breed			
Barred Rocks	2 males	50 hens	180 pullets
White Wyandottes	2 males	19 hens	71 pullets
Toulouse Geese	1 gander	2 geese	
Pekin Ducks	1 drake	4 ducks	

The geese and ducks were purchased in December. They will be kept as commercial flocks in order to secure data on the cost of maintenance and the profits accruing from these fowl.

As the present accommodation at this Station is somewhat limited, the experimental and pedigree work cannot be carried on satisfactorily with two breeds of poultry. The Wyandottes will therefore be disposed of. They have given good satisfaction, but they are not so popular throughout the province as the Barred Rocks, and the aim of the Station is to breed the classes of poultry in greatest demand in the district served.

WORK

The Barred Plymouth Rock and White Wyandotte flocks were improved during the year by careful breeding and selection. Records were kept of incubation, egg production, cost of rearing chicks and the production from hens and pullets of each breed. Experiments were conducted to determine: (1) the value of skim-milk versus beef scrap, (2) the value of home-mixed vs. commercial poultry feed, (3) the best methods of feeding growing pullets, (4) the profit accruing from caponizing. The second New Brunswick egg-laying contest ended October 31, and the third contest was begun on the 1st of November.

PRODUCTION AND PRICES

Production of eggs both on the poultry plant and in the egg-laying contest was rather low during the winter months. This low winter production was general throughout the province, and resulted in an excellent price during the winter months.

The flocks of Barred Plymouth Rocks and White Wyandottes were carefully culled at the beginning of the poultry year, and two pens of hens and two pens of pullets of each breed were selected because of their production, type and vigour. Separate records were kept of each pen until the 1st of June, when, owing to limited accommodation, the birds of each breed were run together. The average production of the birds per month and the total production of the plant and prices obtained are shown in the following table:—

AVERAGE PRODUCTION PER BIRD

Month	Barred Plymouth Rocks				White Wyandottes				Total eggs	Price
	Hens Pen 5	Hens Pen 7	Pullets Pen 2	Pullets Pen 3	Hens Pen 6	Hens Pen 8	Pullets Pen 1	Pullets Pen 4		
Nov.	2·5	.....	0·25	.....	1·1	.....	0·4	0·5	220	$0 55
Dec.	2·3	.....	2·50	5·4	2·2	.....	2·5	5·6	619	70
Jan.	2·8	0·4	4·4	9·0	3·9	0·2	9·6	9·6	1,127	70
Feb.	5·4	1·0	6·0	8·2	5·8	2·7	9·8	8·0	1,367	60
Mar.	10·3	15·3	10·7	12·6	8·2	10·9	12·7	13·3	2,542	45
April	14·9	18·5	9·9	12·3	11·3	21·4	9·9	10·7	2,822	30
May	19·9	17·2	13·4	12·0	13·0	12·1	11·1	15·0	2,860	30
June	14·8	.....	14·6	12·4	11·1	.....	10·0	13·2	2,276	30
July	13·2	.....	.....	.....	12·5	.....	.....	.....	1,513	30
Aug.	14·4	.....	.....	.....	9·3	.....	.....	.....	770	35
Sept.	10·0	.....	.....	.....	8·7	.....	.....	.....	495	35
Oct.	8·1	.....	.....	.....	4·9	.....	.....	.....	454	45
Period Nov. 1 to Feb. 28.	13·0	1·4	13·15	22·6	13·0	2·9	22·3	23·7	3,333	.....
Period Nov. 1 to May 31.	58·1	52·4	47·15	59·5	45·5	47·3	56·0	62·7	11,557	.....

The records show that the pullets produced a much larger percentage of their eggs during the winter months when prices were high. This is true even when the hens were severely culled. As the egg production should be large during the months when high prices prevail, the majority of the laying flock should be pullets and the old hens should be severely culled and only the very best kept.

METHOD OF FEEDING

Scratch feed consisting of two parts cracked corn, one part whole wheat and one part oats was fed in the litter morning and evening. Dry mash consisting of equal parts bran, ground oats, middlings, corn-meal and beef scrap, was kept in hoppers before the birds at all times. Oyster shell, grit and charcoal were kept in hoppers available for the birds at all times. Green feed and water were also provided.

EGGS FOR HATCHING

There was considerable demand for hatching eggs during the hatching season. Forty settings, mostly Barred Rocks, were sold. This breed is apparently very popular with the farmers in the province, as the demand for hatching eggs of this breed was at least four times greater than the supply.

BREEDING STOCK SOLD

A considerable number of Barred Rock and a few White Wyandotte cockerels were sold for breeding purposes. The cockerels sold this year were

exceptionally fine birds, and the sale of these high-class pedigree cockerels from high-producing mothers will help to raise the average egg production throughout the province.

PEDIGREE BREEDING

In order to obtain data on egg production (especially winter egg production), size of eggs, origin of bird and the ability of birds to transmit their good qualities, all birds were trap-nested, and pedigree and mating records are kept of each bird producing 200 eggs or over in her first year. This work was begun only two years ago, but results obtained thus far would indicate that pedigree breeding when combined with careful raising of chicks will result in a higher egg standard of production.

INCUBATION

A 1,200-egg Candee incubator was used during the season for hatching purposes. No pullet eggs were set, the eggs set being all from mature hens. As these hens were not forced for production during the winter months the percentage of fertile eggs was high, and the chicks were vigorous. The hatching records were as follows:—

TOTAL HATCHING RESULTS.

No. of eggs set.	Per cent Fertile.	Per cent Eggs Set Hatched.	Per cent Fertile Eggs Hatched.
2220	88·5	49	55·4

HATCHING RESULTS FROM SETTINGS OF DIFFERENT DATES

Date set	Date hatched	Number of eggs set	Per cent fertile	Per cent total eggs hatched	Per cent fertile eggs hatched
March 20	April 10	417	86·0	20·6	23·9
March 31	April 21	571	90·7	52·5	57·9
April 11	May 1	723	86·3	56·1	63·9
April 26	May 16	509	88·8	58·3	65·7

HATCHING RESULTS FROM HENS OF DIFFERENT BREEDS

Breed	Number of eggs set	Per cent fertile	Per cent total eggs hatched	Per cent fertile eggs hatched
Barred Rocks	1,554	90·9	51·8	57·0
White Wyandottes	666	82·7	42·4	51·3
Total	2,220	88·5	49·0	55·4

REARING YOUNG CHICKS

The young chicks were fed according to the following plan. They were left in the incubator without any food until the second day. They were then

removed to a brooder and given some fine sand followed by buttermilk and water on the third day. For the next ten days they were fed five times a day as follows.

7.20 a.m.—Equal parts middlings and cornmeal.
10.00 a.m.—Rolled oats.
12.30 a.m.—Commercial chick feed.
3.00 p.m.—Rolled oats.
5.30 p.m.—Commercial chick feed.

All this feed was fed dry, and they were given all the buttermilk they would drink.

From this time until two months of age they had free access to buttermilk and a dry mash consisting of 2 parts bran, 1 part middlings, 1 part cornmeal, 1 part ground oats, and 10 per cent beef scrap. They were also fed chick feed morning and night, and a portion of the dry mash was moistened and fed at noon. Eighteen cans of tomatoes were fed to the 743 chicks in the wet mash at noon. These tomatoes seemed to act as a tonic and the cost was low, amounting to less than half a cent per chick. At the end of two months the chicks were taken out of the brooder and pullets and cockerels put in separate pens.

COST OF REARING CHICKS TO TWO MONTHS OF AGE

Project.—Records were kept of the eggs, coal and feed required to produce a two month old chick. No allowance however, was made for labour, interest and depreciation of buildings. The results are shown in the following table.

COST OF TWO MONTH OLD CHICK

Number of eggs set	2,220
Number of chicks hatched	1,087
Number of chicks raised to 2 months	743
Cost of 2,220 eggs at $1 per setting of 15	$148 00
Lb. coal used in incubator and brooders	4,500
Cost of 4,500 lb. coal	$40 50
18 can tomatoes at $2 per dozen	3 00
200 lb. chick feed at $4 per cwt	8 00
100 lb. chick feed at $4.50 per cwt	4 50
150 lb. mash at $1.87 per cwt	2 80
200 lb. rolled oats at $3.65 per cwt	7 30
750 lb. grain mixture at $2.25 per cwt	16 87
800 lb. mash at $2.38 per cwt	19 04
Total cost of feed	61 51
Cost of eggs to produce each 2 month old chick	0·1992
Cost of coal to produce each 2 month old chick	0·0545
Cost of feed for each chick, labour neglected	0·0828
Total cost of eggs, feed and coal to produce each 2 months old chick	$ 0·3365

CAPONIZING EXPERIMENT

In 1922 a caponizing experiment was conducted at this station to obtain data, (1) on the cost of producing capons, (2) on the profit accruing from the productions of capons when sold on the local market, (3) on the feasibility of holding the birds for the Montreal February market.

Eighty-two Barred Rock cockerels, the majority of which were from a May 15 hatch, were caponized on the 7th, 11th and 12th of August. They were all starved for 48 hours previous to being caponized. Six birds were killed during the operation and three died a few days later. The remaining capons were put on fairly close range and fed a grain ration consisting of 2 parts cracked corn, 1 part wheat, 1 part oats, and a dry mash consisting of equal parts of bran, middlings, cornmeal, crushed oats, and ten per cent beef scrap. The grain ration was fed on the ground in the morning and afternoon, and the dry mash was fed in hoppers.

The first two lots of capons were fattened on a mash made up of 2 parts cornmeal and 1 part of the mash fed the capons during the growing period. The last lot was given the same mash in the early part of the fattening period as the first two lots, but in the latter part of the fattening period a mash was fed made up of 1 part of cornmeal and 1 part of the mash fed in the growing period. The mash was made into a slop with buttermilk and fed twice each day.

The capons were fattened in three different lots. The first lot, consisting of twenty-three birds, was put on a fattening ration on the 1st of November. They were kept on this ration for a thirty day period and killed the 2nd of December. The second lot, consisting of thirty-four birds, was put on a fattening ration on the 2nd of December. They were kept on this ration for a seventeen day period and killed December 20. The remaining sixteen birds were put on a fattening ration on the 24th of January. They were kept on this ration for a twenty-nine day period and killed February 23. All birds were starved for thirty-six hours previous to being killed. The weight of the bird was taken before being killed as well as the dressed and drawn weight of the bird. (A local by-law prohibits the sale of undrawn birds in the city market, and as all the birds were eventually sold on a local market the drawn weight is given rather than the undrawn).

The birds killed on the 23rd of February were sent to Montreal in order to see whether the February market in that city would pay a price which would justify holding capons over from the local Christmas market. The commission man to whom these birds were sent in Montreal said, "They should not be called capons but rather big fat roosters only fit for boiling." He was accordingly instructed to ship them back to the station. They were then drawn and sold on the local market.

As considerable time was lost in transporting these birds to and from Montreal they could only be classed as cold storage birds, and it was therefore necessary to accept forty-five cents per pound for them. This was five cents less per pound than was obtained from the previous lots. This difference in price, however, was due to the handling the birds received rather to any appreciable difference in the quality of the capons killed in February as compared with those killed in December. The flesh of the capons killed in February was pronounced excellent by the purchasers. Therefore as the difference in price was due to the treatment given the birds after killing rather than to any difference in either the quality or market, the later killed capons are credited at the same price per pound as these which were killed earlier. The results were as follows:—

COST OF PRODUCING CAPONS

Number of birds in pen		23	34	16
Average age at beginning of period	months	3	3	3
Number of days on growing ration		82	113	166
Number of days on fattening ration		30	17	29
Gross initial weight	lb.	61·1	90·3	42·7
Average initial weight	"	2·656	2·656	2·668
Gross finished live weight	"	138	227	124
Average finished live weight, starved	"	6·00	6·67	7·75
Total gain in period	"	76·9	136·7	81·3
Average gain per bird in period	"	3·34	4·02	5·08
Gross weight, dressed and drawn, gizzard and necks left in	"	100·0	161·5	94·0
Average weight, dressed and drawn, gizzard and necks left in	"	4·34	4·75	5·88
Dressing percentage	"	72·4	71·1	75·8
Grain fed in growing period	"	271	689·5	459·5
Mash fed in growing period	"	120	289	188
Mash fed in fattening period	"	150	185	192
Buttermilk fed in fattening period	"	360	393	301
Cost of grain fed in growing period at $2.25 per cwt	$	6·098	15·514	10·339
Cost of mash fed in growing period at $2.38 per cwt	$	2·856	6·878	4·474
Cost of mash in fattening period at $2.13 per cwt	$	3·195	3·941	·980
Cost of mash in fattening period at $2.25 per cwt	$	.....	.....	3·285
Buttermilk fed in fattening period at 15c. per cwt	$	0·540	0·590	0·451
Total cost of feed	$	12·689	26·923	19·529
Cost to produce 1 lb. gain in live weight	$	0·165	0·197	0·240
Cost of capons at 50c. each	$	11·50	17·00	8·00
Cost per lb. dressed weight, initial cost of capons neglected	$	0·127	0·167	0·208
Total cost of capons and feed	$	24·189	43·923	27·529
Value of capons at 50c. per lb. dressed weight	$	50·00	80·75	47·00
Profit on pen	$	25·811	36·827	19·471
Average profit on each bird	$	1·122	1·083	1·217

Deductions

I. That capons can be produced at a profit.

II. That, while the cheapest gains are made by killing the capons early, the greatest profit bird is obtained by keeping the capons until they mature.

III. That there is no advantage in shipping capons from Fredericton to the Montreal market in February.

BEEF SCRAP VERSUS SKIM-MILK AS ANIMAL FEED FOR LAYING HENS

In order to obtain data on the relative value of skim-milk and beef scrap for laying hens, two pens of Barred Rock pullets were fed for comparison from the 1st of December, 1921, to January 31, 1922. Except that one pen was given skim-milk to drink and the other had 10 per cent of beef scrap in the dry mash, the feeds were identical. All feed was fed dry excepting from January 9 to February 9, when a portion of the dry mash was moistened with hot water and fed at noon. The number of birds in each pen was as follows: December 1 to February 1, 25 birds; February 1 to April 1, 24 birds; April 1 to the end of period, 23 birds. The results obtained are shown in the following table:—

BEEF SCRAP VS. SKIM-MILK

Pen	Scratch feed	Mash	Beef scrap	Skim-milk	Cost feed	Eggs laid	Value eggs	Cost per doz.	Profit
	lbs.	lbs.	1	lbs.					
Beef scrap	610	435	72	.....	$29.12	1,105	$39.96	$0.316	$10.52
Skim-milk	620	395	.....	1,620	28.59	1,437	56.69	0.238	28.09

Beef scrap was charged at $6.00 and $6.50 per 100 pounds.
Skim-milk was charged at $0.25 per 100 pounds.

Deductions

I. That skim-milk can replace beef scrap as animal food for laying hens.

II. That skim-milk is equal, if not superior, to beef scrap for egg production.

III. That skim-milk, when available at the price paid, is a more economical form of animal food than beef scrap.

HOME-MIXED VERSUS COMMERCIAL POULTRY FEED FOR EGG PRODUCTION

In order to obtain data on the relative value of home-mixed and commercial poultry feeds and the cost of egg production from each, an experiment was conducted with two pens of White Wyandotte pullets. They were fed for comparison from December 1, 1921, to May 31, 1922. One pen was fed commercial scratch feed and mash, and the other pen was fed a home-mixed scratch feed consisting of two parts cracked corn, 1 part wheat, and 1 part oats; and a mash consisting of equal parts bran, middlings, cornmeal, crushed oats and beef scrap. The scratch feed was fed in the litter and the mash was fed dry in a hopper. From January 9 to February 9 a portion of the dry mash was moistened and fed to the birds at noon. They were given mangels as green feed, and had free access to oyster shell, grit and water. The results are shown in the following table:—

HOME-MIXED VS. COMMERCIAL FEEDS

Pen	Number of birds in pen	Scratch feed	Mash	Cost feed	Eggs laid	Value	Cost per doz.	Profit
		lbs.	lbs.					
Commercial Feeds	25	590	365	$33.14	1,286	$51.50	$0.309	$18.98
Home-mixed Feeds.....	25	600	430	26.94	1,441	57.09	0.224	23.96

Deductions

I. That home-mixed poultry feeds at the present prices paid are as efficient per unit as commercial poultry feeds, for egg production.

II. That eggs can be produced more cheaply by using home-mixed feeds.

FEEDING GROWING PULLETS

With a view to finding the best and most economical ration for growing pullets, those at this Station were divided into four pens and fed as follows:—

Pen I was fed grain and dry mash in hoppers and picked their own green feed. A small quantity of buttermilk was fed at the beginning of the feeding period.

Pen II was fed grain scattered on the ground twice a day, dry mash in a hopper, picked their own green feed, and were fed buttermilk the first half of the period.

Pen III was fed dry mash in a hopper, wet mash morning and noon, dry crimped oats in a trough in the morning, and picked their own green feed. (The wet mash was moistened with eight pounds of buttermilk each day.)

Pen IV was fed a wet mash to which was added equal parts of green clover three times a day. This mash was moistened with buttermilk.

The mash fed to all pens consisted of equal parts of cornmeal, bran, middlings, crushed oats and 10 per cent beef scrap. The grain fed pens 1, 2 and 4 consisted of two parts cornmeal and one part wheat. All these feeds were charged at cost prices. The green feed is charged at 15 cents per 100 pounds. This, however, does not cover the cost of preparing the feed. The chicks would not eat it unless it was cut into small pieces and a fresh supply cut each day. It took thirty-five minutes each day, or a total of sixty-three hours, at 25 cents per hour to prepare this food. When this charge was added to pen 4 it made the cost per pound of gain for this pen very high. The results are shown in the following table:—

COST OF FEEDING GROWING PULLETS

—	Pen I	Pen II	Pen III	Pen IV
Number of days in experiment	121	115	79	108
Age at beginning of period—weeks	7½-9	8	11	8
Initial number of chicks	90	75	64	45
Number of chicks raised	86	73	61	43
Gross initial weight.....lb.	101	74	95	41
Gross initial weight of chicks raised.....lb.	96·4	72·0	90·5	39·1
Average initial weight.....lb.	1.12	·98	1·48	·91
Gross weight at end of period.....lb.	406·5	316·0	253·0	169·0
Average weight at end of period.....lb.	4·72	4·32	4·14	3·93
Whole grain fed in period.....lb.	1245·	820	.....	.....
Mash fed in period.....lb.	472	580	415	610
Crimped oats fed in period.....lb.	.....	.....	610	.....
Buttermilk fed in period.....lb.	100	495	632	2,048
Green feed fed in period.....lb.	.....	.....	.....	610
Total cost of feed in period.....lb.	39·39	32·99	27·89	19·10
Cost of preparing green feed, 63 hours at 25c.....lb.	.....	.....	.....	15·75
Total gain of chicks during period.....lb.	310·1	244·00	162·5	129·9
Total gain per day.....lb.	2·56	2·12	2·05	1·20
Average gain per chick.....lb.	3·60	3·34	2·66	3·02
Average daily gain per chick.....lb.	·0297	·0290	·0336	·0279
Cost per lb., gain, labour and dead chicks neglected.$	0·127	0·135	0·171	0·147
Cost of labour preparing green feed per lb. gain..... $	.....	.....	.....	0·122
Total cost labour feeding chicks neglected..... $	0·127	0·135	0·171	0·269

Deductions

I. That hopper fed chicks will make the most economical gains.

II. That there is no advantage in hand feeding.

III. That growing pullets should have whole grain.

IV. That the labour of preparing green feed for chickens makes it too expensive on a small scale, but on a large scale a machine for preparing it might be used.

NEW BRUNSWICK EGG LAYING CONTEST

The second New Brunswick Egg Laying Contest ended on the 30th of October. Fifteen pens owned by breeders in the province were entered, along with five pens from the Experimental Station. Fourteen pens were Barred Plymouth Rocks, three White Wyandottes, two Rhode Island Reds and one White Leghorn. The birds were housed in portable, shed-roofed, glass-and-cotton-front houses. The houses were twelve by twelve feet in dimension and divided into two pens. Each pen accommodated ten hens.

The hens were fed scratch feed, consisting of two parts cracked corn, one part whole wheat and one part oats, in the litter in the morning and afternoon. Dry mash, consisting of equal parts bran, middlings, cornmeal, ground oats and beef scrap, was kept in a hopper before the birds at all times. Wet mash, made by moistening the above dry mash with water or buttermilk was fed to the birds at mid-day during the winter months.

Seventy-six hens laid 150 eggs or over, and qualified for the Record of Performance Certificate AA. Eight hens laid 225 eggs or over, and qualified for Advanced Record of Performance Certificate AA. Twenty-five hens laid 200 eggs or over and qualified for Registration in the Canadian National Poultry Records.

The best hen, No. 4 in Pen 10, laid 247 eggs.

The best pen, No. 9 had 2,143 eggs to its credit.

The list of contestants, individual records of the birds, cost of feed and profit over cost of feed are shown in the following table.

Pen	Owner and Address	Breed	1	2	3	4	5	6	7	8	9	10	F	T.	Cost of feed per year	Food cost per doz. eggs	Profit over cost of feed
															$	$	$
9	W. E. B. Tait, Dorchester	B.R.	186	230	245	236	224	173	245	199	171	228	6	2,143	30 86	0·172	39 12
4	A. T. Reid, Rollingdam Sta.	"	234	192	231	d131	186	207	205	125	189	x151	12	1,863	28 31	0·182	34 09
2	Eugene Monahan, Elmsville	"	204	206	129	x181	155	131	152	171	x150	168	7	1,654	26 64	0·193	22 69
20	Exptl. Station, Fredericton	"	186	124	29	208	184	150	164	156	193	86	6	1,486	25 71	0·207	23 62
15	David Rankin, Fredericton	R.I.R.	193	111	145	188	124	88	185	87	134	209	7	1,471	29 05	0·237	16 31
13	Mrs Geo. Danby, North Devon	W.W.	133	67	155	x129	151	142	186	134	107	209	16	1,429	24 85	0·208	21 20
11	G. E. Wilson, Centreville	B.R.	13	d133	152	176	96	189	143	143	224	152	4	1,425	27 52	0·231	16 79
8	L. B. Johnston, Nashwaaksis	"	93	x128	211	167	134	196	121	133	117	x101	12	1,413	24 74	0·210	19 17
10	Allen & Ferguson, Fredericton	"	121	114	107	247	104	135	x111	xd130	203	116	10	1,398	23 99	0·205	21 02
12	R. A. Snowball, Chatham	W.L.	158	220	162	94	188	157	d 23	84	x125	142	14	1,367	23 91	0·209	18 58
17	Exptl. Station, Fredericton	W.W.	101	185	189	153	139	41	71	95	173	188	18	1,353	22 73	0·202	27 22
18	Exptl. Station, Fredericton	B.R.	180	62	107	x 96	124	188	189	214	30	x142	7	1,339	27 33	0·244	18 11
5	Harry Patterson, Hoyt	"	132	191	207	87	112	125	141	87	59	193	2	1,336	26 23	0·235	15 32
7	N. W. Eveleigh, Sussex	"	117	146	108	189	93	28	123	119	197	167	10	1,297	26 28	0·243	14 55
1	H. R. Emmerson, Dorchester	"	182	x 83	119	89	108	121	204	184	108	55	5	1,258	23 67	0·225	14 49
6	R. A. Snowball, Chatham	"	211	118	147	165	117	177	84	d 58	169	–	7	1,253	26 92	0·257	11 98
3	C. M. Peart, Havelock	"	198	x151	54	84	120	d 22	94	d 36	194	217	18	1,188	24 77	0·250	13 77
19	Exptl. Station, Fredericton	"	147	131	188	78	x 96	159	116	40	11	195	4	1,165	24 42	0·251	15 25
16	Exptl. Station, Fredericton	W.W.	111	x118	142	75	118	dx40	x118	x191	123	80	7	1,123	24 68	0·263	17 11
14	N. W. Eveleigh, Sussex	R.I.R.	162	130	d 72	102	35	d 34	129	90	60	100	11	925	22 77	0·295	6 23

x Production of more than one bird. d Dead but not substituted. B.R.—Barred Plymouth Rock. R.I.R.—Rhode Island Red.
W.W.—White Wyandotte. W.L.—White Leghorn.

BEES.

Ten colonies were placed in winter quarters on the 2nd of November, 1921. These colonies,, after feeding, weighed (including bottom board but not cover) on an average, sixty-two pounds. Eight colonies were wintered in the cellar and two in the honey house. Those wintered in the honey house were put in boxes and protected by four inches of planer shavings. The stores were fall-gathered honey and sugar syrup.

A beekeeper was appointed on the 1st of April. He found one of the colonies in the honey house had died from dysentery and two of those in the cellar were so weak that they had to be joined to stronger colonies. The bees were put on their summerstands on the 10th April. The willow blossoms were abundant from May 2 to 15, and dandelions were in blossom on the 22nd of May. It was decided to increase the apiary without regard to honey production. One colony was put on the scale to obtain data on yields and sources of honey. The other six colonies were used for obtaining nuclei for increases. Six 2-pound packages of bees and eighteen queens were purchased from a Quebec apiary to supplement the colonies on hand. The packages arrived in good condition. Weather conditions were very unfavourable for both increase and honey production. The bees had to be fed sugar syrup throughout the season. Twenty-nine new colonies were formed, making a total of thirty-six in the fall. They were rather weak, however. In six of the colonies the bees had only covered four combs; in fifteen they had covered six combs; in ten they had covered seven combs and in five they had covered eight combs. Sugar syrup was fed in division boards and inverted honey cans. The average weight of the thirty-six colonies after feeding, (including bottom board but not cover) was 51·6 pounds. The bees were stored in the cellar on November 22 and December 2.

HONEY PRODUCTION

The season was very unfavourable for honey production. The honey was mostly obtained from raspberry blossoms and fireweed. Very little was obtained from clover. The results from the hive on the scale were as follows:—

Month	Increase	Source of Honey
	lbs.	
May	−5·0	Wild Cherry, Dandelion and Apple Blossom.
June	12·5	Raspberry.
July	14·5	Raspberry, Clover, Canadian Thistle, Fireweed and Goldenrod.
August	27·5	Clover, Fireweed and Goldenrod.
September	15·0	Goldenrod.
October (4 dys. only)	−·5	
Total	64·0	

GENERAL FARM NOTES

EXTENSION AND PUBLICITY

The advantage of a number of small excursions as compared with one large excursion was clearly demonstrated at this Station this year. At these small excursions, the farmers were able to become acquainted with the experimental work at the Station. The first excursions were held for groups of agricultural

societies. Members of from five to eight societies from adjacent districts participated in each excursion. The attendance ranged from twenty-five to two hundred and fifty at each excursion.

A special series of field days, featuring Poultry, Potatoes, Fruit and Live Stock, was held, to induce farmers living at a distance to visit the Station. Special programmes were prepared, and invitations sent out to farmers who were known to be particularly interested in the branch of work featured. The attendance at these field days ranged from one hundred to three hundred, and represented practically every section of the Province.

The York County Council, Woodstock Junior Farmers' Association and the New Brunswick branch of the Canadian Society of Technical Agriculturists were also entertained. The total attendance at all the excursions was estimated at three thousand.

Exhibits were displayed at the St. John, St. Stephen, Woodstock, Chatham and Centreville exhibitions. While these exhibits embraced practically every branch of agriculture, the special features were live stock, poultry and field crops. Members of the staff were on hand at all times to give out information and receive applications for literature.

The staff prepared a number of press articles dealing with subjects of interest to New Brunswick farmers. They also delivered addresses at a number of farmers' meetings and acted as judges at fall and winter exhibitions.

FARM IMPROVEMENTS

The cottage in the Superintendent's yard was removed to the poultry plant and remodelled. Half of the old barn in the orchard was torn down and the other half was attached to the sheep barn. The lower story will be used for lambing pens and for brood sows. The upper story will be used as a storage barn for hay for the sheep. Concrete pavement was laid in the barnyard and work was continued on a permanent road through the lawns. Bushes were cut on fifty acres of land. Thirty acres of this land were broken with a Manitoba brush breaking plough drawn by two yoke of oxen. As the land on the farm is very stony, oxen are much more suitable than horses for this work. An attempt was made to break land with the Chase tractor, but, owing to the rough nature of the land, it was found impossible.