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 1926

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TABLE OF CONTENTS

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NOTES ON THE SEASON

The fall of 1925 was open. This enabled the heavy precipitation of October and November to soak into the soil, therefore the soil and subsoil were saturated with water when winter set in.

The winter was the longest in the history of the Station. The ground was covered with snow from December 22, 1925, to April 22, 1926, at which date the snow was removed by a rain of .64 inches. The ice ran out of the St. John river on May 1. This was a month later than the previous year. Owing to the deep snow the orchard suffered more from snow injury than any previous year. There was, however, very little winter-killing. There was more winter-killing than usual on wet new seeded land.

The sping was unusually late. Ploughing was begun on May 10, as compared with April 21 the previous year. The first dates of planting field crops were: wheat, May 17; potatoes, May 22, oats, June 1; barley, June 3; corn, June 4; sunflowers, June 11.

The early summer was cold, with high winds. This checked growth, especially of the corn crop, and decreased the stooling of grain. The weather was more favourable the latter part of July and the hay, grain, and root crops made splendid growth.

The fall was wet, October having the highest precipitation of any month in the history of the Station. This made harvesting difficult. The grain was fair, although a large portion of it on wet land could not be cut with a binder. There was also considerable rust. Roots and potatoes were a good crop, but corn was only fifty per cent of an average yield.

November was an open month, and it was possible to plough nearly all the month. The sheep were housed on November 15. The St. John river froze over on December 6. There was sufficient snow to make good sleighing after December 9. Eighteen and one-half inches of snow fell during December. Each fall of snow, however, was followed by mild weather and there were only six inches of snow on the ground at the end of the month.

TABLE 1.—1926 METEOROLOGICAL RECORDS

	Temperature (F.)						Precipitation (inches)				Sunshine	
	Mean		Maximum		Minimum		Rain	Snow	Total Precipitation		1926	Average, 13 years
	1926	Average, 13 years	Highest	Mean Maximum	Lowest	Mean Minimum			1926	Average, 13 years		
	°	°	°	°	°	°	in.	in.	in.	in.	hr.	hr.
January	13·26	11·72	47·0	22·7	−23	3·79	1·90	32·0	5·16	3·59	88·05	105·50
February	15·30	14·92	39·0	24·7	−18	5·9	0·15	39·0	4·05	2·69	134·55	123·47
March	20·70	26·38	50·0	31·7	−24	9·7	0·77	14·0	2·17	2·89	161·00	147·64
April	34·50	40·30	57·0	42·6	12	26·3	1·48	19·5	3·43	3·32	168·80	152·99
May	48·20	50·96	72·5	59·1	30	37·4	1·87	3·0	2·17	2·28	178·65	202·65
June	59·20	60·49	82·0	71·28	34	47·15	2·06	.....	2·06	3·22	235·20	202·93
July	65·45	66·52	87·0	76·66	42	54·25	3·43	.....	3·43	2·90	257·05	220·18
August	62·09	64·08	81·0	72·03	38	52·16	6·05	.....	6·05	3·56	208·95	206·34
September	55·18	56·16	76·0	65·43	30	44·93	3·01	.....	3·01	3·33	183·05	168·48
October	45·29	45·99	65·0	53·61	25	36·96	7·97	2·0	8·17	3·52	128·70	149·03
November	35·48	32·36	63·0	44·31	10	26·65	3·05	1·5	3·20	2·91	100·25	89·81
December	16·38	18·49	39·0	24·95	−10	7·82	.....	18·5	1·85	2·85	105·10	91·55

ANIMAL HUSBANDRY

The work carried on under this division consisted of breeding and feeding experiments, cost of production, and demonstrational work.

CATTLE

The herd consisted of the following stock on January 1, 1927:—

Pure-Bred—

Ayrshire: 9 cows, 6 heifers, 1 bull; total	16
Holstein: 6 cows, 10 heifers, 4 bulls; total	20
Shorthorns: 4 cows, 4 heifers, 1 bull; total	9

Grade Stock—

8 cows, 4 heifers; total	12
4 work oxen	4
Total stock on hand	61

Heifer calves of good type and breeding were retained in the herd, and the bull calves were disposed of to farmers at reasonable prices. Inferior calves were sold to drovers.

The Ayrshire herd sire, " Ottawa Lord Kyle 24th "—91808—was bred at the Central Experimental Farm, Ottawa, Ont. He is a good type of dairy bull, and was awarded the sweepstake for bulls of the breed at the Fredericton Exhibition in 1926.

The Holstein herd sire, " Korndyke Midnight Boy "—59015—was also bred at the Central Experimental Farm, Ottawa, Ont.

The Shorthorns have been greatly reduced as all the animals of a number of families which were poor milk producers were sold. The herd sire " Brandon Conjuror "—144189—was bred at the Dominion Experimental Farm, Brandon, Man.

SUMMER FEEDING

The grass was abundant but of rather poor quality, therefore the milch cows were fed grain during the entire pasture season. From June 30 milch cows which were being milked three times each day, and from July 31 all the milch cows, were fed green oats and peas. The grain fed the cows while on pasture consisted of two parts corn meal, one part brewers' grain and one part bran.

WINTER FEEDING

The roughage ration for the winter consisted chiefly of corn silage, swedes, and mixed clover and timothy hay. A small quantity of other feeds as sunflowers silage, oats and pea silage, were also fed, but they are not considered as the main feed.

The meal ration varied at times owing to the nature of the feeds on hand, but consisted for the most part of bran, one part; oats, one part, brewers' grains, two parts; and oil cake, one part. One per cent of salt was added at mixing, with a view to supplying regularly this very necessary ingredient in the ration. One tablespoonful of the following mineral mixture was fed daily; 100 pounds calcium phosphate, 100 pounds sodium phosphate, 120 pounds Epsom salts, 40 Glaubers salts, 100 pounds sulphur, 2 pounds potassium iodide.

DAIRY HERD RECORDS

Table 2 shows the milk record of all the milch cows that finished a lactation period during the year 1926. In the case of heifers with their first calf, feed is charged from date of freshening. In the case of cows with previous lactation periods, the charge for feed includes the period during which they were dry before beginning the lactation period here recorded. The following prices were charged for feed:—

Hay	$ 8 80 per ton
Roots	4 81 per ton
Ensilage	6 55 per ton
Green feed	5 50 per ton
Meal mixture when milking	39 00 per ton
Meal mixture when dry	38 00 per ton
Pasture	1 00 per month

These values represent the cost of production of hay, roots and ensilage for 1926, and the price paid for car load lots, plus a small charge for hauling from car to Station for the grain which made up the meal mixture.

TABLE 2—INDIVIDUAL MILK RECORDS COMPLETED DURING THE YEAR

Name of cow	Age at beginning of lactation period	Date of dropping calf	No. of days in lactation period	Total pounds of milk for period	Daily average yield of milk	Average per cent fat in milk	Pounds of butter produced in period	Value of butter at 45c. per pound	Value of skim-milk at 20c. per cwt.	Total value of product	Amount of meal eaten at $1.90 and $1.95 per cwt.	Amount of roots at $4.81 per ton and ensilage at $6.55 per ton	Amount of hay eaten at $8.80 per ton	Amount of green feed at $5.50 per ton	Amount of beet pulp at $45.75 per ton	Months on pasture at $1.00 per month	Total cost of feed for period	Cost to produce 100 lb. of milk	Cost to produce 1 lb. butter skim-milk neglected	Profit on 1 lb. of butter skim-milk neglected	Profit on cow during period labour and calf neglected
	yrs.			lb.	lb.	p.c.	lb.	$ cts.	$ cts.	$ cts.	lb.	lb.	lb.	lb.	lb.	mos.	$ cts.	$ cts.	$	$	$ cts.
Ayrshires—																					
Ottawa Folly 2nd	2	Feb. 14/24	395	8,828·5	22·35	4·13	428·85	192·98	16·93	209·91	3,647	R–1,290 E–8,825	3,393	2,760	.....	3·25	128·89	1·460	0·301	0·149	81·02
Pansy of F'ton 2nd	5	April 5/25	328	8,382·9	25·56	3·90	384·45	173·00	16·11	189·11	3,481	R–6,145 E–7,781	4,108	2,510	.....	3·25	136·37	1·627	·355	·095	52·74
White Bess of Ottawa 2nd.	7	Jan. 27/26	273	8,072·7	29·57	3·71	352·23	158·50	15·55	174·05	2,776	R–4,385 E–5,785	3,144	2,250	680	3·77	122·75	1·525	·349	·101	51·30
Midnight.....	5	June 28/25	277	6,247·0	22·55	4·85	355·78	160·10	11·89	171·99	2,601	R–3,590 E–5,265	3,264	3,545	.....	3·00	103·70	1·660	·291	·159	68·29
Fredericton Garnet.	2	Nov.30/25	285	6,064·9	21·28	3·78	269·17	121·13	11·67	132·80	2,303	E–7,680	2,232	840	.....	3·27	85·46	1·409	·317	·133	47·34
Pansy of F'ton 2nd	6	Mar. 16/26	260	5,361·5	20·62	3·88	244·18	109·88	10·31	120·19	1,998	R– 905 E–4,589	2,230	2,040	.....	3·77	75·31	1·405	·308	·142	44·88
Average for Breed	.....	.....	303	7,159·6	23·63	4·03	339·11	162·60	13·74	166·34	2,801	R–2,719 E–6,654	3,062	2,324	113	3·39	108·75	1·519	·321	·129	57·60
Holsteins—																					
Cheer Echo.....	3	April30/25	361·5	17,721·2	49·02	2·86	595·27	267·87	34·43	302·30	5,351	R–7,770 E–8,060	4,274	3,785	.....	3·25	181·90	1·026	·306	·144	120·40
Helen Clover Ormsby.	6	June 5/25	330·5	17,071·6	32·18	3·36	673·19	302·94	32·99	335·93	5,861	R–8,100 E–9,390	5,132	5,625	.....	7·02	209·59	1·228	·311	·139	126·34
March Echo Segis.	3	Oct. 21/24	453	15,279·0	33·73	3·30	592·39	266·58	29·55	296·13	5,064	R–8,160 E–2,410	4,444	2,315	.....	7·05	189·45	1·240	·320	·130	106·68
Johanna Aleartra Lee.	4	Jan. 23/25	315	14,446·7	45·86	3·47	589·11	265·10	27·89	292·99	4,280	R–6,230 E–8,005	3,947	5,220	680	3·77	177·49	1·229	·301	·149	115·50
Lee Keyes Korndyke.	8	April21/25	330	14,207·0	43·05	2·91	485·72	218·57	27·59	246·16	4,611	R–4,810 E–9,555	3,994	3,890	.....	3·25	164·29	1·156	·338	·112	81·87
May Echo Frances.	7	June 7/25	279·5	5,396·2	19·30	2·91	184·77	83·15	10·48	93·63	2,485	R–2,630 E–4,125	2,562	3,970	.....	2·66	93·10	1·735	·504	—·054	0·53
Average for Breed.	.....	.....	378·2	14,020·8	37·07	3·16	520·07	234·03	27·16	261·19	4,625	R–6,283 E–8,591	4,059	4,134	113	4·50	169·30	1·208	·326	·124	91·89
Shorthorns—																					
Princess of Northlynd.	11	July 1/25	295·5	9,360·0	31·68	3·45	379·45	170·75	18·07	188·82	4,025	R–7,930 E–6,510	3,936	3,895	.....	3·00	149·87	1·601	·395	·055	38·95
Kentville Victoria 8th.	2	Jan. 9/25	405	7,069·9	17·46	4·07	338·24	152·21	13·56	165·77	2,694	R–3,410 E–7,505	3,530	2,105	.....	3·25	109·86	1·553	·325	·125	55·91
Kentville Lady 3rd.	3	Jan. 7/26	300	5,852·0	19·51	3·61	248·31	111·74	11·28	123·02	2,464	R– 680 E–7,581	3,306	1,530	.....	3·77	96·88	1·656	·390	·060	26·14
Lady Betty of F'ton.	3	Feb. 15/26	248·5	5,165·6	20·79	3·39	205·91	92·66	9·98	102·64	2,250	R– 730 E–8,662	3,671	1,821	.....	3·77	98·75	1·911	·480	—·030	3·89
Kentville Victoria 8th.	3	April17/26	232	4,653·7	20·07	3·84	209·88	94·45	8·95	103·40	1,593	R– 420 E–4,875	2,316	1,530	.....	3·77	66·07	1·420	·315	·135	37·33
Average for Breed.	.....	.....	296·2	6,420·2	21·68	3·66	276·36	124·36	12·37	136·73	2,605	R–2,634 E–7,027	3,352	2,176	.....	3·51	104·28	1·624	·377	·073	32·45

R=Roots; E=Ensilage.

COST OF REARING DAIRY HEIFERS

Calves were fed whole milk until four to six weeks of age, then they were gradually changed to skim-milk. A fat substitute was added to the skim-milk. The fat substitute fed until the calves were three months of age was composed of one part flax seed and four parts crushed oats. For the older calves one part of crushed oats was replaced by corn meal. Each calf was fed from one-quarter to one pound of this fat substitute per day, the amount fed depending upon the age and condition of the calf. The calves were also fed hay, roots, and dry grain as soon as they would eat them. The composition of this dry meal mixture varied slightly at times owing to the nature of the feed on hand, but was mainly made up of three parts bran, two parts crushed oats, one part oil cake, and one part brewers' grains. The aim in feeding was to keep the calves growing and to avoid a setback.

Yearling and two-year old heifers were turned to pasture on June 1. They were wintered on hay, roots and silage, together with a grain ration of from two to four pounds, depending upon the condition of the animal. The feed costs are shown in table 3.

FEEDING EXPERIMENT—LIBERAL VERSUS LIGHT FEEDING FOR GROWING HEIFERS

This experiment is being carried on to compare a scanty ration with a liberal ration for growing heifers. During April, 1924, fifteen heifers of mixed breeding were divided into two groups. Group I, composed of seven heifers, were fed a scanty ration. Group II, composed of eight heifers, were fed a liberal ration.

One heifer in the liberally fed group was disposed of during the winter of 1924-25. The remaining heifers were all carried until they were two years of age. One heifer in each group would not breed. These two heifers were therefore sold to a drover during the summer of 1926. Of the remaining twelve heifers the six in the well fed, and two of the six in the poorly fed group have freshened. It is planned to carry these heifers through three lactation periods. A full report of this experiment will be given at a later date.

The results for 1926, however, further emphasize the deductions given in the report of this Station for 1925 (page 9).

1. That heifers fed a liberal ration will make larger gains.
2. That these gains will be at a greater cost per hundred weight.
3. That heifers fed a scanty ration during the winter will make larger gains on pasture than heifers which are fed a liberal ration during the winter months.

TABLE 3.—COST OF RAISING DAIRY HEIFERS

Average Cost of Feed—Birth to one year for nine heifers (2 Ayrshires, 2 Holsteins and 5 Shorthorns)

—	Amount of feed consumed	Cost of feed
	lb.	$ cts.
New milk at $40 per ton	484	9 68
Skim-milk at $4 per ton	2,618	5 24
Fat substitute at $61 per ton	172	5 25
Dry meal at $38 per ton	808	15 35
Turnips at $4.81 per ton	2,136	5 14
Ensilage at $6.55 per ton	501	1 64
Beet pulp at $45.75 per ton	3	0 07
Green feed at $5.50 per ton	272	0 75
Hay at $8.80 per ton	1,379	6 07
Total cost of feed per head		49 19

Average Cost of Feed—One to two years for sixteen heifers (3 Ayrshires, 7 Holsteins and 6 Shorthorns)

Meal at $38 per ton	630	11 97
Turnips at $4.81 per ton	2,611	6 28
Ensilage at $6.55 per ton	1,966	6 44
Green feed at $5.50 per ton	18	0 05
Hay at $8.80 per ton	2,628	11 56
	mos.	
Pasture at $1 per month	3·55	3 55
Total cost of feed per head	.....	39 85

Average Cost of Feed—Two years to calving at 2 years 6 months, 21 days for four Heifers (2 Ayrshires, 1 Holstein, 1 Shorthorn)

Meal at $39 per ton	46	0 90
Meal at $38 per ton	291	5 53
Turnips at $4.81 per ton	125	0 30
Ensilage at $6.55 per ton	2,420	7 93
Hay at $8.80 per ton	1,371	6 03
	mos.	
Pasture at $1 per month	2·94	2 94
Total cost of feed per head	.....	23 63

CORN SILAGE VERSUS TURNIPS FOR DAIRY COWS

The experiment conducted last winter was practically a repetition of the one conducted during the winter of 1922-23 and again during the fall of 1923.

Last winter a group of eight cows consisting of two Ayrshires, five Holsteins and one Shorthorn, was used in the experiment. Except when the cows refused their feed the amount of hay and grain fed remained constant throughout the experiment.

The experiment was divided into three periods. Turnips were fed the first and third periods, and corn silage was fed the second period. The first and third periods consisted of three weeks each, and the second period of four weeks. (The corn silage had a decidedly laxative effect the first week of this period, therefore an additional week was added to enable the cows to get back to normal.) Data were taken from the final week in each period, the first weeks in each period being considered necessary for the cattle to become accustomed to the change of feed. The results for the first and third period were averaged and compared with the results for the second period.

For the plan of the two previous experiments see report for this Station for 1923 (page 10). The results from the three experiments are shown in table 4.

The results of these experiments seem to show that the corn silage from the average corn grown in the district has slightly less value for milk production than turnips. The low value of the corn silage is probably due to the low dry-matter content owing to lack of maturity.

TABLE 4—CORN SILAGE VERSUS TURNIPS FOR DAIRY CATTLE

Item	Corn, winter, 1922–23 Experiment 1	Corn, fall, 1923 Experiment 2	Corn, winter, 1925–26 Experiment 3	Corn, Total	Turnips, winter, 1922–23 Experiment 1	Turnips, fall, 1923 Experiment 2	Turnips, winter, 1925–26 Experiment 3	Turnips, Total
Number of cows in test	6	9	8	23	6	9	8	23
Number of days taken for test	7	7	7	7	7	7	7	7
Total milk produced in 7-day period lb.	741·4	1,423·3	1,506·8	3,671·5	776·2	1,438·1	1,578·9	3,793·2
Average per cent fat in milk %	4·26	3·61	3·28	3·61	4·30	3·48	3·13	3·50
Total butterfat produced in 7 days lb.	31·63	51·42	49·36	132·41	33·41	50·08	49·38	132·87
Total meal eaten in 7 days "	357·0	693·0	693·0	1,743·0	357·0	693·0	693·0	1,743·0
Total hay eaten in 7 days "	420·0	560·0	840·0	1,820·0	420·0	560·0	836·0	1,816·0
Total corn silage eaten in 7 days "	2,100·0	3,360·0	2,940·0	8,400·0	.....	.....	.....	.....
Total turnips eaten in 7 days "	.....	.....	.....	.....	2,100·0	3,360·0	2,870·0	8,330·0
Meal consumed per 100 lb. milk "	48·15	48·68	45·99	47·47	45·99	48·18	43·89	45·95
Hay consumed per 100 lb. milk "	56·64	39·34	55·75	49·57	54·10	38·94	52·95	47·88
Corn silage consumed per 100 lb. milk "	283·24	236·07	195·12	228·79	.....	.....	.....	.....
Turnips consumed per 100 lb. milk "	.....	.....	.....	.....	270·54	233·64	181·77	219·63
Statement of Cost (1926 prices)								
Meal mixture at $1.95 per cwt. $	6·96	13·51	13·51	33·98	6·96	13·51	13·51	33·98
Hay at $8.80 per ton $	1·85	2·46	3·70	8·01	1·85	2·46	3·68	7·99
Corn silage at $6.55 per ton $	6·88	11·00	9·63	27·51	.....	.....	.....	.....
Turnips at $4.81 per ton $	.....	.....	.....	.....	5·05	8·08	6·90	20·03
Total cost of feed $	15·69	26·97	26·84	69·50	13·86	24·05	24·09	62·00
Feed cost to produce 100 lb. milk $	2·12	1·89	1·78	1·89	1·79	1·67	1·53	1·63
Feed cost to produce 100 lb. butterfat $	49·60	42·45	54·38	52·49	41·48	48·02	48·79	46·66

Five samples of the corn used in the experiment last winter show an average of 13.47 per cent dry matter. This is only slightly higher than the dry matter in turnips as the turnips had an average of 11.87 per cent dry matter when harvested.

SHEEP

The flock on December 31, 1926, consisted of one aged ram, two ram lambs, twenty aged ewes, ten shearling ewes, and fourteen ewe lambs, all pure-bred Shropshires.

As a protection against tape worm the sheep were again dosed with Male Fern according to the directions in Exhibition Circular No. 61.

The sheep were sheared May 12, dipped and turned to pasture May 27. The lambs were weaned August 2. The sheep were housed November 15.

All the ewes and lambs except those used in the pasture experiment (see Experiments with Fertilizers) were pastured on the Fredericton golf course.

COST OF MAINTAINING PURE-BRED EWES

The ram was put with twenty-three ewes on November 2. They were fed a small grain ration until they were bred. The ewes were on clover aftermath until November 13, when they were housed and fed hay and turnips. After the ewes were bred no grain was given until February 16, when each ewe was fed one-half pound of grain per day. Four days later eight of the ewes in rather poor condition were fed one pound of grain per day. The grain ration was gradually increased until the ewes and lambs were eating one and one-half pounds per ewe when they were turned to pasture. Owing to shortage of turnips the root allowance was stopped on April 25. From May 1 the ewes were fed either corn or sunflower silage until they were turned to pasture.

Two ewes died in April and one ewe which did not breed was sold on May 27. The remaining twenty ewes produced thirty-three lambs. The cost of maintaining the twenty-three ewes, the stock ram and the thirty-three lambs (labour, bedding, interest and depreciation neglected) was:—

17,888 pounds turnips at $4.81 per ton	$ 43 02
780 pounds corn silage at $6.55 per ton	2 56
780 pounds sunflower silage at $4.02 per ton	1 57
9,072 pounds hay at $8.80 per ton	39 92
2,728 pounds meal fed during breeding and lambing at $1.90 per cwt.	51 83
Pasture 21 head at $1.50 each	31 50
Pasture 33 lambs at 50 cents each	16 50
2,720 pounds meal fed lambs after weaning at $1.90 per cwt	51 68
Cost of dipping material	3 00
Total cost	$241 58

The returns from these 23 ewes were:—	
14 XXX rams sold for breeding purposes	$266 00
5 XX rams sold for breeding purposes	70 00
1 XXX ram lamb on hand	25 00
14 ewe lambs kept for breeding purposes, value $20 each	280 00
155 pounds wool at 24.6 cents	38 13
5 pounds wool at 17 cents	0 85
1 non-breeding ewe sold to drover	4 00
Total	$683 98
Profit on ewes, labour, interest and depreciation, neglected	442 40

COST OF WINTERING LAMBS

Twelve pure-bred Shropshire lambs were housed on November 13, 1925. They were fed a daily ration of three pounds turnips and what hay they would clean up, until April 1. After that date they were fed hay alone. On May 17 two of these lambs were sold to a neighbouring farmer. The remaining ten ewes were turned to pasture on May 27. The average cost per head and returns (ten lambs on hand) when turned to pasture were:—

349 pounds hay at $8.80 per ton	$1 54
405 pounds turnips at $4.81 per ton	0 97
Total cost of feed	$2 51
8.85 pounds wool at 24.6 cents per pound	2 18
Cost of wintering lambs over revenue from wool, (bedding, labour and interest neglected)	0 33

HORSES

On January 1, 1927 there were seventeen horses in stock including (pure-bred Clydesdales) one aged stallion, one three-year-old stallion, five mares, one gelding, two one-year-old mares, one filly, and (Grade Clydesdales) one gelding, two mares, one one-year-old mare, and two general purpose horses.

One pure-bred Clydesdale filly was born during the year. As a preventative of joint ill the pregnant dam was given a teaspoonsful of potassium iodide on the first and fifteenth of each month. The filly had no indication of joint ill.

The three-year-old Clydesdale stallion Prolific C.E.F. 24364, was available for service during the past season.

The grain ration for work horses consisted of a mixture of bran and oats. The percentage of bran varied according to the character of the work. The

horses worked a total of 24,459 hours during the year. Eight heavy horses worked a total of 17,216 during the year. The cost of feed and horseshoeing for these eight horses was as follows:—

26 tons 1,290 pounds of hay at $8.80 per ton	$ 234 48
1,137 bushels 30 pounds oats at 61.2 cents per bushel	696 38
4 tons 1,458 pounds bran at $31 per ton	146 60
1,539 pounds roots at $4.81 per ton	3 70
32 gallons molasses at 25 cents per gallon	8 00
Horseshoeing at $3 for new shoes and $1.75 for changing shoes	146 75
Total cost (labour, interest, depreciation and drugs neglected)	$ 1,235 91
Number of hours worked	17,216.0
Cost of horse labour per hour	$ 0.072

FEED COST OF RAISING YOUNG HORSES

Feed costs have been kept of the feed consumed by young horses from birth to three years. No allowance has been made, however, for the time lost or the feed consumed by their dams.

TABLE 5.—FEED COST OF RAISING YOUNG HORSES

Item		Birth to 6 months	Birth to 1 year			Birth to 3 years
		Beauty	Grace	Duchess of Fredericton	Beauty	Fredericton Prince
Oats	lb.	335	1,358	1,313	1,118	4,984·0
Oatmeal	"	71	.....	.....	71	.....
Bran	"	169	492	506	380	2,035·0
Hay	"	714	1,713	1,920	1,618	9,998·0
Roots	"	.....	120	120	.....	494·0
Pasture	months	.....	3	3	3	9·3
Molasses	gallons	2	2	4	4	4·0
Weight at end of period	lb.	424	890	735	685	1,525·0
Statement of Costs						
Oats at $36 per ton	$	6·03	24·44	23·63	21·26	89·71
Oatmeal at $4.17 per 100 pounds	$	2·96	.....	.....	2·96	.....
Bran at $31 per ton	$	2·62	7·63	7·84	5·89	31·54
Hay at $8.80 per ton	$	3·14	7·54	8·45	7·12	43·99
Roots at $4.81 per ton	$	.....	0·29	0·29	.....	1·19
Pasture at $1 per month	$	.....	3·00	3·00	3·00	9·30
Molasses at 25c. per gallon	$	0·50	0·50	1·00	1·00	1·00
Total cost of feed	$	15·25	43·40	44·21	41·23	176·73

NOTE.—No charges made for feed consumed by mares when suckling colts.

TABLE 6.—FARROWING RECORDS

Charging the feeds at the same price as in the table, the last nine horses raised cost an average of $12.17 at six months, and of $40.43 at one year. They weighed an average of 623 pounds at six months, and of 793 pounds at one year.

The last six horses cost an average of $90.99 at two years and $157.01 at three years. They weighed an average of 1,186 pounds at two years and of 1,416 pounds at three years.

SWINE

The swine herd at this Station on December 31, 1926, numbered eighteen head, consisting of the two pure-bred Yorkshire boars, "Charlottetown Boy" –114974– and "Ottawa Alexander 239" –120064–, with eight pure-bred Yorkshire brood sows and eight feeders four months of age. The brood sows are a

particularly strong lot and farrowed their first litters in the spring of 1926, averaging eleven pigs per litter. Four of the eight young brood sows in the herd are daughters of "Fredericton Augustine 127" and "Fredericton Augustine 128", two litter mates out of "Fredericton Augustine 78", all four were sired by the imported boar "Rogersfield Wonder" -88844-.

FARROWING RECORDS

The year's farrowing record was, due to the large proportion of young sows in the herd, not a very satisfactory one.

Sow number	Date of birth	Farrowing date	Number of pigs in litter	Number reared
331	March 3, 1923	March 24, 1926	11	9
127	May 11, 1922	March 24, 1926	12	7
128	May 11, 1922	April 10, 1926	14	7
320	April 5, 1925	April 18, 1926	13	7
321	April 5, 1925	April 28, 1926	11	6
287	April 12, 1925	April 30, 1926	13	11
583	March 21, 1925	May 3, 1926	14	7
530	January 18, 1925	May 3, 1926	7	2
290	April 14, 1925	May 8, 1926	9	6
381	April 12. 1925	May 8, 1926	11	9
586	March 21, 1925	May 8, 1926	10	6
Total			125	77

Average number of pigs farrowed per spring litter	11·3
Average number of pigs reared per spring litter	7·0
Percentage of pigs reared per spring litter	61·6

COST OF REARING LITTERS

Statement of feed fed to sows, from breeding date, in case of young sows, and from date last litter was weaned, in the case of old sows:—

Roots, 433 pounds at 24 cents per cwt	$ 1 03
Bran, 105 pounds at $1.55 per cwt	1 62
Crushed oats, 130 pounds at $1.80 per cwt	2 34
Middlings, 130 pounds at $2.05 per cwt	2 66
Corn, 25 pounds at $2.10 per cwt	0 52
Milk, 517 pounds at 20 cents per cwt	1 03
Total	$ 9 20

Statement of Feed from Birth to Weaning

Skim-milk, 473 pounds at 20 cents per cwt	$ 0 94
Crushed oats, 140 pounds at $1.80 per cwt	2 52
Middlings, 140 pounds at $2.05 per cwt	2 87
Total	$ 6 33

Statement of Cost

Boar service	$ 2 00
Feed to birth	9 20
Feed, birth to weaning	6 33
Total cost to weaning	$17 53
Average cost per pig to weaning (7 pigs per litter)	2 50

SKIM-MILK VERSUS TANKAGE VERSUS FISH MEAL AS SUPPLEMENTS TO THE MEAL RATION

This experiment was undertaken to compare skim-milk, tankage and fish meal as supplements to the meal ration for hogs.

Twelve pigs were used in the experiment and divided into three lots of four pigs.

Group I had skim-milk in addition to the meal ration from time of weaning until hogs were slaughtered.

Group II had tankage in addition to the meal ration from time of weaning until hogs were slaughtered.

Group III had fish meal in addition to the meal ration from time of weaning until hogs were slaughtered.

The meal ration fed to all groups the first sixty days consisted of oats, two parts; buckwheat, one part; shorts, one part; middlings, one part. The amount of buckwheat was then increased to two parts, the other feeds remaining the same until the end of the experiment.

The following prices were charged for the feeds used in this, and other experiments conducted during the year:—

	Per cwt.
Crushed oats	$1 80
Middlings	2 05
Shorts	1 70
Tankage	3 60
Buckwheat	3 00
Skim-milk	0 20
Fish meal	3 07

The results are shown in table 7.

TABLE 7.—SKIM-MILK VERSUS TANKAGE VERSUS FISH MEAL AS SUPPLEMENTS TO THE MEAL RATION

—		Group I Skim-milk	Group II Tankage	Group III Fish meal
Number of pigs in experiment		4	4	4
Number of days in experiment		153	153	153
Gross initial weight at 6 weeks	lb.	69·0	117·0	85·0
Average	"	17·2	29·2	21·2
Gross finished weight	lb.	787·5	829·0	753·0
Average finished weight	"	196·9	207·2	188·2
Gross dressed weight	"	595·0	616·0	547·0
Total gain per group	"	718·5	712·0	668·0
Average daily gain per animal	"	1·17	1·16	1·09
Average gain per animal	"	179·6	178·0	167·0
Statement of Feeds				
Total skim-milk fed	"	6,215·0	.....	.....
Total tankage fed	"	.....	171·0	.....
Total fish meal fed	"	.....	.....	179·0
Total crushed oats fed	"	686·0	678·0	668·0
Total buckwheat fed	"	636·0	615·0	607·0
Total shorts fed	"	343·0	339·0	334·0
Total middlings fed	"	343·0	339·0	334·0
Meal fed per 100 lb. gain	"	279·4	276·8	290·8
Statement of Costs				
Cost of pigs at 6 weeks	$	20 00	20 00	20 00
Total cost of meal fed	$	44 28	43 35	42 74
Total cost of skim-milk fed	$	12 43	.....	.....
Total cost of tankage	$	.....	6 15	.....
Total cost of fish meal	$	.....	.....	5 49
Total cost of feed	$	56 71	49 50	48 23
Total cost of hogs	$	76 71	69 50	68 23
Cost per 100 lb. gain	$	7 89	6 95	7 22
Cost per 100 lb. dressed weight	$	12 89	11 28	12 47
Gross revenue	$	90 56	95 33	86 59
Net profit	$	13 85	25 83	18 36
Average profit per hog	$	3 46	6 45	4 59

SKIM-MILK VERSUS FISH MEAL FOR MARKET HOGS

This experiment was undertaken to compare skim-milk and fish meal as supplements to the meal ration for hogs.

Thirty-two pigs were used in the experiment and divided into eight lots of four each. A standard meal ration was fed to each lot. For the first sixty days the ration consisted of oats, two parts; buckwheat, one part; shorts, one part; middlings, one part; for the remainder of the feeding period the buckwheat was increased to two parts, the other feeds remained as before.

Skim-milk and fish meal were fed according to the following plan:—

Lot I—Skim-milk from weaning to finish, with standard meal ration.

Lot II—Fish meal from weaning to finish, with standard meal ration. (In all cases where fish meal was fed it composed 8 per cent of the total meal fed.)

Lot III—Skim-milk until pigs were three months of age, then milk replaced by fish meal.

Lot IV—Skim-milk until pigs were four months of age, then milk replaced by fish meal.

Lot V—Skim-milk until pigs were five months of age, then milk replaced by fish meal.

Lot VI—Skim-milk until pigs were three months of age. (No fish meal.)

Lot VII—Skim-milk until pigs were four months of age. (No fish meal.)

Lot VIII—Skim-milk until pigs were five months of age. (No fish meal.)

TABLE 8—SKIM-MILK VERSUS FISH MEAL AS SUPPLEMENTS TO THE MEAL RATION

—	Lot I	Lot II	Lot III	Lot IV	Lot V	Lot IV	Lot VII	Lot VIII
Number of hogs in experiment	4	4	4	4	4	4	4	4
Number of days in experiment	153	153	153	153	153	153	153	153
Gross initial weight at 6 weeks. lb.	69·0	85·0	113·0	120·0	51·0	86·0	65·0	60·0
Average initial weight at 6 weeks "	17·2	21·2	28·2	30·0	12·7	21·5	16·2	15·0
Gross finished weight "	787·5	753·0	832·0	865·0	666·0	782·0	729·0	760·0
Average finished weight "	196·8	188·2	208·0	216·2	166·5	195·5	182·2	190·0
Gross dressed weight "	595·0	547·0	616·0	653·0	496·0	596·0	530·0	562·0
Average dressed weight "	148·75	136·75	154·0	163·25	124·0	149·0	132·5	140·5
Total gain per group "	718·5	668·0	719·0	745·0	615·0	696·0	664·0	700·0
Average daily gain per animal "	1·17	1·09	1·17	1·21	1·00	1·13	1·08	1·14
Average gain per animal "	179·6	167·0	179·7	186·2	153·7	174·0	166·0	175·0
Statement of Feeds								
Fish meal fed lb.	.....	179·0	161·9	110·8	59·4	.....	.....	.....
Crushed oats "	686·0	668·0	662·4	679·0	629·8	712·8	689·4	693·0
Buckwheat "	636·0	607·0	604·2	620·8	579·9	654·6	639·5	643·1
Shorts "	345·0	334·0	331·2	339·5	314·9	356·4	344·7	346·5
Middlings "	343·0	334·0	331·2	339·5	314·9	356·4	344·7	346·5
Skim-milk "	6,215·0	.....	1·243·0	2,411·0	4,580·0	1,427·0	3,304·0	4,589·0
Meal fed per 100 pounds gain "	279·4	290·8	268·2	265·6	299·1	297·4	303·9	289·8
Statement of Costs								
Cost of pigs at 6 weeks $	20·00	20·00	20·00	20·00	20·00	20·00	20·00	20·00
Total cost of meal fed $	44·28	42·74	42·45	43·56	40·52	45·81	44·49	44·75
Total cost of skim-milk $	12·43	.....	2·48	4·82	9·16	2·85	6·60	9·17
Total cost of fish meal $	.....	5·49	4·97	3·40	1·82	.....	.....	.....
Total cost of feed $	56·71	48·23	49·90	51·78	51·50	48·66	51·09	53·92
Total cost of hogs $	76·71	68·23	69·90	71·78	71·50	68·66	71·09	73·92
Cost per 100 pounds gain $	7·89	7·22	6·94	6·95	8·37	6·99	7·69	7·70
Cost per 100 pounds dressed weight $	12·89	12·47	11·34	10·99	14·41	11·52	13·41	13·15
Gross revenue $	90·56	86·59	95·68	99·47	76·59	89·93	83·83	87·40
Net Profit $	13·85	18·36	25·78	27·69	5·09	21·27	12·74	13·48
Average profit per hog $	3·46	4·59	6·44	6·92	1·27	6·31	3·18	3·37

This is the first year that this experiment has been conducted and further deductions cannot be made until the experiment has been repeated several times. It will be noted that pen I and pens VII and VIII, where skim-milk was the supplement used for the greater part, cost more per hundred pounds gain. The

high costs in connection with Pen V are misleading because this pen of pigs was of mediocre breeding and did not respond to feed in the same way that the other hogs did. While this makes deductions rather unsatisfactory, at the same time the following would appear to be in order.

1. That pigs are capable of making slightly more profitable gains when fed to about three months of age on a ration supplemented with skim-milk and then the skim-milk replaced by fish meal than when feeding skim-milk for the full period.

2. That when fed at the rate of 8 per cent of the meal ration fish meal is more profitably fed than when feeding skim-milk at the rate of three pounds to one of meal *but that skim-milk gives more rapid gains.*

3. That, while skim-milk is necessary early in the feeding period for weaned pigs, it may profitably be discontinued after three months of age.

4. That after three months of age a fish meal supplement will give more rapid and also more economical gains than when no supplement is used.

5. That the feeding of skim-milk after three months of age results in slightly increased feed costs, these depending on the length of time the skim-milk was fed.

DEPTH OF FAT

In the two preceding experiments, after the hogs were slaughtered, the depth of fat on the hogs' back was taken at the shoulder, middle of the back and loin. The average depth of fat per pen is listed in table IX.

TABLE IX.—DEPTH OF FAT

Pen	Treatment	Average depth of fat
		in.
1	Skim-milk from weaning to slaughter	1·22
2	Tankage from weaning to slaughter	1·02
3	Fish meal from weaning to slaughter	1·16
4	Milk to 3 months, then fish meal to finish	1·35
5	Milk to 4 months, then fish meal to finish	1·33
6	Milk to 5 months, then fish meal to finish	1·12
7	Milk to 3 months, no fish meal	1·27
8	Milk to 4 months, no fish meal	1·35
9	Milk to 5 months, no fish meal	1·41

These results would indicate that skim-milk has a further value in that it resulted in better finished carcasses than was the case with lots fed only tankage or fish meal.

FIELD HUSBANDRY

The work in this division included production costs with various field crops; rotation experiments comparing three-, four-, five- and six-year rotations; also different treatments as to manure and fertilizer; an experiment comparing the cost of producing succulent feeds from different sources; experiments with rates of seeding Marquis wheat and Victory oats; and dates of seeding Victory oats.

Owing to a wet, open, fall the soil was well saturated when winter set in. The land was covered with snow from December 22, 1925, to April 22, 1926. The weather during April and May was cold and the land dried slowly. Ploughing was begun on May 10. The spring seeding was later than usual. The first dates of planting field crops were as follows: wheat, May 17; potatoes, May 22; oats, June 1; barley, June 3; corn, June 4; sunflowers, June 11.

Hay and grain gave lighter yields than the previous year. Corn was a very poor crop. Potatoes, turnips and sunflowers were good crops. The harvesting was very difficult owing to wet weather.

CROP PRODUCTION COSTS

COST OF PRODUCING HAY IN A FOUR-YEAR ROTATION

Hay making was begun on July 5 and finished on August 4. The hay crop this year was 147 tons, 1,190 pounds. Fifteen acres of rotation land yielded 24 tons, 1,315 pounds, or at the rate of 1 ton, 1,288 pounds per acre. The cost of production per acre from fifteen acres was:—

Rent and taxes		$ 3 00
Manure 1.5 tons at $2 per ton		3 00
Seed—Timothy ½ of 10 pounds at $13 per cwt		0 65
Red clover ½ of 8 pounds at $30 per cwt		1 20
Alsike ½ of 2 pounds at $24.50 per cwt		0 25
Machinery		2 85
Mowing, man and 2 horses .93 hours at 45 cents	$ 0 42	
Tedding, man and 2 horses .47 hours at 45 cents	0 21	
Raking, man and 2 horses .47 hours at 45 cents	0 21	
Raking, man and 1 horse .33 hours at 35 cents	0 12	
Coiling and shaking out, 1 man 2.17 hours at 25 cents	0 54	
Drawing to barn and pitching, 1 man and 2 horses, 2.4 hours at 45 cents	1 08	
Loading, pitching and storing, 1 man 3.5 hours at 25 cents	0 88	
Clipping, 1 man .13 hours at 25 cents	0 03	
	$ 3 49	3 49
Total cost per acre		14 44

Yield per acre, 1.64 tons.
Cost per ton, $8.80.

COST OF PRODUCING OATS IN A THREE-YEAR ROTATION

Cost of production of oats was kept on a field which had been in hoed crop the previous year. For the hoed crop the land was manured at the rate of 15 tons barnyard manure and 1,000 pounds 4-8-6 home-mixed fertilizer per acre. The costs are shown in the following table :—

Variety: Victory.
Date of seeding: June 1.
Date of harvesting: September 20.

Rent and taxes		$ 3 00
Manure—30 per cent of 15 tons at $2		9 00
Fertilizer—333 pounds superphosphate at $21 per ton		3 50
Seed—3 bushels at $1 per bushel		3 00
Machinery		2 85
Twine—2 pounds at 17 cents per pound		0 34
Ploughing (spring), 1 man, 3 horses, 5 hours at 55 cents	$ 2 75	
Harrowing (disking), 1 man, 2 horses, 2 hours at 45 cents	0 90	
Harrowing (smoothing), 1 man, 2 horses, 1.5 hours at 45 cents	0 68	
Rolling, 1 man, 2 horses, .5 hours at 45 cents	0 23	
Seeding, 1 man, 2 horses, 1 hour at 45 cents	0 45	
Binding, 1 man, 2 horses, 1.5 hours at 45 cents	0 68	
Stooking, 1 man, 1.5 hours at 25 cents	0 38	
Hauling, 1 man, 2 horses, 3 hours at 45 cents	1 35	
Spreading stooks and loading, 1 man, 5 hours at 25 cents	1 25	
	$ 8 67	8 67
Threshing 55 bushels at 8 cents per bushel		4 40
Total cost per acre		$34 76

Yield per acre, 55 bushels oats and 2,605 pounds straw.

COST OF PRODUCING SUCCULENT FOOD FROM DIFFERENT SOURCES

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

This year the crops were grown on clay loam which has been in hay the two previous years. The land was ploughed in the fall. In the spring a twenty-ton application of barnyard manure was ploughed under. Six hundred pounds of 4-8-6 home-mixed fertilizer per acre was then applied and thoroughly mixed with the soil by means of the disk and smoothing harrow.

The varieties used this year were, White Capped Yellow Dent corn, Russian Giant sunflowers, Victory oats, Canadian Beauty peas;and Bangholm swedes. A summary of results for 1926 is given in table 10 and a summary of results for the five years in table 11.

TABLE 10.—COST OF PRODUCTION SUMMARY, 1926

—		Corn	Sunflowers	Oats and Peas	Swedes
Rate of Seeding	lb.	20	18	Oats 68, Peas 60.	2
Date of Seeding		June 15	June 12	June 4	June 17
Date of Harvesting		Sept. 2	Sept. 24	Sept. 4	Oct. 22
Rent and Taxes	$	3 00	3 00	3 00	3 00
40 per cent of manure at $2. per ton	$	16 00	16 00	16 00	16 00
Fertilizer	$	7 17	9 06	7 40	6 77
Seed	$	0 71	2 07	5 40	0 80
Machinery	$	2 85	2 85	2 85	2 85
Ploughing, fall, man and two horses at 45 c. per h.	$	4 50	4 50	4 50	4 50
Ploughing, spring, man and three horses at 55 cts. per hour	$	2 75	2 75	2 75	2 75
Harrowing (disking) man and two horses at 45 cts. per hour	$	1 35	1 35	1 35	1 35
Harrowing (smoothing) man and two horses at 45 cts. per hour	$	0 90	0 90	0 90	1 80
Sowing fertilizer, man at 25 cts. per hour	$	0 75	0 75	0 75	0 75
Rolling, man and two horses at 45 cts. per hour	$	0 23	0 23	0 23	0 23
Ridging, man and two horses at 45 cts. per hour	$	.....	.....	.....	0 90
Seeding, man and two horses at 45 cts. per hour	$	0 67	0 90	0 45	.....
Seeding, man and 1 horse at 35 cts. per hour	$	.....	.....	.....	0 35
Weeder, man and one horse at 35 cts. per hour	$	0 35	0 35	.....	.....
Cultivating, man and two horses at 45 cts. per hour	$	4 50	4 50	.....	.....
Cultivating, man and one horse at 35 cts. per hour.	$	.....	.....	.....	3 50
Thinning and hoeing, man at 25 cts. per hour	$	.....	.....	.....	15 00
Harvesting and storing	$	9 69	17 00	15 30	11 95
Twine at 17 cts. per lb	$	0 34	0 68	.....	.....
Rent of silage cutter and blower at 40 cts. per hour.	$	1 20	2 00	2 00	.....
Total cost per acre	$	56 96	68 89	62 88	72 50
Yield per acre, green weight	ton	8 69	17 13	10 33	10 85
Yield per acre, dry weight	ton	0 93	1 95	1 79	1 16
Dry matter	per cent	10 70	11 44	17 28	10 68
Cost per ton, green weight	$	6 55	4 02	6 09	6 68

NOTE.—[1]The following prices were charged for seed: corn, $2.00 per bushel; sunflowers, $11.50 per cwt.; swedes, 40c. per pound; oats, $1.00 per bushel; peas, $3.40 per bushel.

[2]The low yield and high cost of swedes was due to club root. The main crop of swedes yielded 18·92 tons per acre and cost $4.81 per ton.

TABLE 11.—COST OF PRODUCING SUCCULENT FOOD FROM DIFFERENT SOURCES—SUMMARY 1922-1926 INCLUSIVE

—		Corn	Sunflowers	Oats and Peas	Swedes
Rent and taxes	$	3 00	3 00	3 00	3 00
Manure and fertilizer	$	21 15	21 87	20 58	20 48
Use of machinery	$	2 57	2 57	2 57	2 49
Preparation of land	$	8 91	8 68	9 02	11 89
Seeding	$	0 90	0 90	0 52	0 47
Seed	$	0 93	1 73	6 02	0 92
Cultivation and thinning	$	4 60	5 67	.....	15 52
Harvesting and storing	$	14 83	17 85	12 85	15 29
Twine	$	0 44	0 50	.....	.....
Total cost per acre	$	57 08	62 98	54 56	69 87
Yield per acre, green weight	lb.	13 32	14 64	8 76	17 14
Cost per ton, green weight	$	4 29	4 30	6 23	4 08

The results for five years seem to show:—

(1) That oats and peas are not a profitable silage crop.

(2) That when cost of harvesting is taken into consideration, sunflowers have no appreciable advantage over corn in cost of production, and when the palatability of the two crops are taken into consideration, corn is the superior crop.

(3) That although the roots were a short crop in 1925 owing to cut worms, and again in 1926 owing to club root, they cost slightly less than corn per ton green weight for the five years that the experiment was carried on (dry matter samples were not taken in 1922 and 1923. The per cent dry matter in corn for the last three years was: 1924, 15.70 per cent; 1925, 14.57 per cent; 1926, 10.70 per cent. The per cent dry matter in turnips was: 1924, 15.33 per cent; 1925, 10.31 per cent; and 1926, 10.68 per cent.

CULTURAL TESTS

MARQUIS WHEAT—RATE OF SEEDING

Duplicate 1/100 acre plots were sown with Marquis wheat on May 15, 1925, and on May 31, 1926. The rates of seeding and the results are shown in table 12.

TABLE 12.—MARQUIS WHEAT—RATES OF SEEDING

Rate of Seeding	Number of days maturing 1926	Yield of grain per acre 1926		Yield of straw per acre 1926		Yield of grain per acre 1925		Yield of straw per acre 1925	
		bush.	lb.	ton.	lb.	bush.	lb.	ton.	lb.
Bushel—									
1	101	5	13	—	1037	13	20	1	300
1½	101	6	34	—	1156	13	32	1	488
2	101	7	49	—	1481	20	12	1	888

VICTORY OATS—RATES OF SEEDING

Duplicate 1/100 acre plots were sown with Victory oats on May 15, 1925, and on May 31, 1926. The rates of seeding and the results are shown in table 13.

TABLE 13.—VICTORY OATS—RATES OF SEEDING

Rate of Seeding	Number of days maturing 1926	Yield of grain per acre 1926		Yield of straw per acre 1926		Yield of grain per acre 1925		Yield of straw per acre 1925	
		bush.	lb.	ton.	lb.	bush.	lb.	ton	lb.
Bushel—									
2	110	43	19	—	1,969	69	4	1	700
2½	110	46	30	1	6	66	31	1	825
3	106	44	20	1	334	70	—	1	964
3½	106	56	21	1	925	69	4	1	1,350
4	106	50	6	1	344	65	15	1	1,075

VICTORY OATS—DATES OF SEEDING

Duplicate 1/100 acre plots were sown with Victory oats in 1925 and in 1926. The dates of seeding and results are shown in table 14.

TABLE 14.—VICTORY OATS—DATES OF SEEDING

Date of Sowing	Number of days maturing	Yield of grain per acre		Yield of straw per acre	
		bush.	lb.	ton	lb.
May 31, 1926	106	44	20	1	334
June 12, 1926	110	48	24	1	1,044
June 23, 1926	124	37	11	1	981
May 14, 1925	106	70	0	1	964
May 26, 1925	100	72	27	1	1,825
June 7, 1925	94	66	6	2	550

CORN GROWN IN HILLS VERSUS DRILLS

The land on which this test was conducted was a clay loam which grew a crop of turnips the previous year. For the turnips the land was manured at the rate of fifteen tons barnyard manure and 800 pounds 4-8-6 home-mixed fertilizer per acre. This spring 15 tons of manure were ploughed under. The land was then given a broadcast application of 1,600 pounds 4-8-6 home-mixed fertilizer per acre. This fertilizer was worked into the land with the disc and smoothing harrow. White Capped Yellow Dent was grown in drills three feet apart and one foot between plants, and in hills three feet apart each way with three plants to each hill. Triplicate plots were sown in each manner on June 2 and harvested on September 28.

In harvesting the corn all land which did not have a perfect stand was disregarded. The corn grown in drills gave an average yield of ten tons, 354 pounds forage, containing 1 ton, 285 pounds dry matter per acre. The corn grown in hills gave an average yield of 10 tons, 1,265 pounds forage containing 1 ton, 489 pounds dry matter per acre. An increase of 4.4 per cent on a forage basis, and of 8.9 per cent on a dry matter basis over the corn grown in drills. This experiment was also conducted in 1925 and is reported under the forage division in the report for that year. Last year the hills gave an increase of 11.4 per cent on a forage basis, and of 15.8 per cent on a dry matter basis, over the corn grown in drills.

OTHER EXPERIMENTS

The rotation experiments, various cultural experiments, and other farm management experiments will be reported at a later date when more data accumulates.

HORTICULTURE

ORCHARD

The year 1926 was notable for its long winter, deep snow, and late spring. While the winter was a long one, no particularly low temperatures were recorded and there were no prolonged periods of very cold weather. Very little winter-killing occurred, but some injury was done by the deep snow and by mice.

The orchard did not come into full bloom until June 12. This was a week later than in 1925. The bloom did not fall until five days after the date of full bloom and sufficient fruit set on most varieties to produce a good crop. The fall was fairly open and in spite of the late spring the fruit developed good size and colour.

A scab infection developed in this orchard for the first time since it was established. The worst infection occurred in the variety-orchard and in the McIntosh and Fameuse block of the cultural orchard. The commercial orchard was the least affected. The treatment of the different orchards was as follows:—

CULTURAL ORCHARD (MCINTOSH AND FAMEUSE BLOCK)

This orchard was sprayed with lime-sulphur of different strengths combined with different insecticides and used with and without aluminium sulphate. Applications were made as follows:—

1st application—May 22-23.
2nd application—May 31–June 1.
3rd application—June 24–June 25.
4th application—July 12-July 13.

COMMERCIAL ORCHARD

This orchard was sprayed in accordance with the recommendations of the New Brunswick spray calendar. The materials used and dates of application were as follows:—

1st application—Applied May 24 when the leaf tips showed green.
Materials: 3-10-40 Bordeaux plus 1½ pounds arsenate of lime.
2nd application—Applied June 2 when blossom buds showed pink.
Materials: same as above.
3rd application—Applied June 18-19 when bloom had fallen.
Materials: wettable sulphur 10 pounds, arsenate of lead 2 pounds, water, 40 gallons.
4th. application—Applied June 9 (McIntosh and Fameuse).
Material: 3-10-40 Bordeaux plus 1½ pounds arsenate of lime.

VARIETY ORCHARD

This orchard was treated as follows:—

1st application—May 25 sprayed with 3-10-40 liquid Bordeaux mixture plus 1½ pounds arsenate of lime.
2nd application—June 5 dusted with 12-8-80 copper arsenate dust.
3rd application—June 18 dusted with 90-10 sulphur lead arsenate dust.

EXPERIMENT WITH LIME-SULPHUR

Bordeaux mixture has generally been used in this province for all orchard applications excepting the after-blossom spray. The use of this material usually results in a certain amount of russeting which detracts from the general appearance of the fruit. Sulphur sprays do not cause this injury. In order to determine the value of lime-sulphur sprays an experiment was outlined by the Entomological Branch and carried on co-operatively at this Station. The objects of this experiment were to determine the value of lime-sulphur as a fungicide and to determine the value of aluminium sulphate in reducing the injury which sometimes occurs from using lime-sulphur on apple trees. Different insecticides were also used with the different strengths of lime sulphur and aluminium sulphate combination.

The results in general with lime-sulphur were not very satisfactory from the standpoint of scab control. The percentages of scab on check trees, and in plots receiving different strengths of lime-sulphur, regardless of the poisons and the amount of aluminium sulphate used, are shown in table 15. A record is also shown in this same table of the amount of scab on two average trees in the commercial orchard, sprayed according to the New Brunswick spray calendar, on the dates previously mentioned.

TABLE 15.—EXPERIMENT WITH LIME-SULPHUR

Variety	How Sprayed	Per cent light scab	Per cent heavy scab	Per cent cracked with scab	Total per cent scab	No. of trees
McIntosh	Lime-sulphur, 1 to 60	47·77	49·13	.....	96·90	2
"	Lime-sulphur, 1 to 40	46·48	29·06	.....	75·54	24
"	Lime-sulphur, 1 to 20	57·40	11·72	.....	69·12	7
"	Lime-sulphur, 1 to 10	16·33	0·65	.....	16·98	1
"	New Brunswick Spray Calendar	51·23	3·30	.....	54·53	1
"	Check	5·0	55·0	40·0	100·0	1
Fameuse	Lime-sulphur 1 to 60,	65·86	11·53	.....	77·39	1
"	Lime-sulphur, 1 to 40	46·75	6·3	.....	53·05	27
"	Lime-sulphur, 1 to 20	22·68	2·32	.....	25·00	7
"	Lime sulphur, 1 to 10	42·40	7·32	.....	49·72	1
"	New Brunswick Spray Calendar	2·97	.....	.....	2·97	1
"	Check	25·81	69·45	.....	95·26	1

This experiment was duplicated on a farm about seven miles north of here, and good scab control was obtained from the use of lime-sulphur but some foliage injury resulted from using lime-sulphur for the after-blossom spray. Foliage injury occurred in only one plot at this Station, viz., where lime-sulphur, 1 to 10, plus 2½ pounds aluminium sulphate was used for the after-blossom application.

It is rather difficult to account for the indifferent scab control from the use of lime-sulphur in the Station orchard. Records were kept during the summer by the Plant Pathological Laboratory at this Station of the dates and rates of ascospore discharge. These records are shown in table 16.

TABLE 16.—ASCOSPORE DISCHARGE—EXPERIMENTAL STATION

Date	Spore discharge, counts taken from 10 microscopic fields of 18 slide traps	Precipitation	Temperature		Sunshine
			Maximum	Minimum	
			°	°	hrs.
May 5	82	0·14	57	32	13·65
" 6	23	.....	59	30	9·75
" 7	.....	.....	57	34	10·15
" 8	7	.....	55	30	2·95
" 9	.....	0·23	43	32	0·10
" 10	3	0·08	51	32	3·00
" 11	54	0·29	48	37	1·70
" 12	30	0·20	45	37	.....
" 13	.....	.....	63	35	11·55
" 14	.....	.....	64	34	2·30
" 15	.....	.....	66	34	6·70
" 16	.....	.....	73	35	13·55
" 17	.....	.....	68	40	0·90
" 18	27	0·03	68	43	7·30
" 19	.....	0·01	64	40	13·00
" 20	.....	0·08	64	40	1·15
" 21	3	0·01	59	35	13·50
" 22	.....	.....	62	44	2·60
" 23	.....	.....	68	39	2·80
" 24	56	.....	55	47	0·10
" 25	317	.....	49	40	0·00
" 26	260	0·04	50	41	0·15
" 27	503	.....	56	42	4·95
" 28	662	.....	57	44	0·40
" 29	361	.....	63	38	7·65
" 30	.....	0·02	65	42	9·55
" 31	655	.....	65	43	11·10
June 1	638	.....	68	45	2·80
" 2	522	0·08	75	49	6·45
" 3	.....	0·03	74	49	4·00
" 4	510	.....	62	40	9·45
" 5	175	.....	67	42	8·55

TABLE 16.—ASCOSPORE DISCHARGE—EXPERIMENTAL STATION—*Concluded*

Date	Spore discharge, counts taken from 10 microscopic fields of 18 slide traps	Precipitation	Temperature		Sunshine
			Maximum	Minimum	
			°	°	hrs.
June 6			65	37	0·50
" 7	1,599	0·13	62	49	0·00
" 8	1,642	0·44	68	48	9·05
" 9	1,515		70	45	8·05
" 10	529		68	48	4·85
" 11	1,072		65	49	5·55
" 12	630		73	50	11·45
" 13			80	63	11·95
" 14	2,832		79	57	12·65
" 15	1,373		72	48	0·00
" 16	1,290	0·32	74	39	11·00
" 17	1,394		78	45	11·20
" 18	734		64	42	1·10
" 19	1,157	0·44	59	48	13·35
" 20			60	35	10·40
" 21	2,832		74	34	10·35
" 22	1,313		68	47	2·35
" 23	1,517	0·06	76	50	12·85
" 24	1,583	0·11	78	56	9·95
" 25	495		82	48	13·10
" 26	506		78	50	8·05
" 27		0·39	73	54	8·50
" 28	2,108		73	46	11·80
" 29	337	0·02	76	50	5·45
" 30	492	0·04	82	52	10·55
July 1	725		77	60	13·15
" 2	467		79	54	10·05
" 3	565	0·33	80	62	10·10
" 4			78	56	14·30
" 5	2,306		78	48	13·95
" 6	1,224		76	48	5·85
" 7	294		66	54	11·65
" 8		0·05	70	43	8·25
" 9	1,200	0·10	72	53	5·70
" 10	1,189	0·37	69	44	0·00
" 11			69	52	0·00
" 12	1,915	0·54	76	55	13·70
" 13	3,689		76	49	13·35
" 14	1,770	0·24	78	55	3·50
" 15	1,400		76	52	7·15
" 16	1,325		72	54	0·00
" 17	2,330	0·04	81	60	13·40
" 18			80	57	3·45
" 19	1,916	0·82	68	57	4·30
" 20	760	0·10	78	47	9·55
" 21	498	0·21	87	57	8·10
" 22	1,602	0·40	87	59	8·25
" 23	600	0·16	78	65	12·25
" 24	331		81	52	10·05
" 25			70	59	11·45
" 26	464		75	42	12·75
" 27	137		83	53	10·75
" 28	108		86	59	5·40
" 29	7		84	64	4·45
" 30	50	0·07	73	60	2·05
" 31			82	52	10·15
August 1			79	53	10·85
" 2			75	52	1·15
" 3	68		71	60	0·00
" 4	209	0·08	80	60	11·55
" 5	75		77	47	13·15
" 6	275		79	45	12·15
" 7	3		81	60	1·75
" 8		2,38	79	66	0·55
" 9	3,232	1·52	70	58	1·55
" 10		0·03	80	51	10·45

No records of spore discharge were kept for Sundays.

A correlation of the dates of spraying and spore discharge shows: (1) the first sprays of both lime-sulphur and Bordeau mixture were applied before there was any heavy discharge of spores; (2) the second sprays were applied in good time; (3) the third spray of lime-sulphur was applied six days later than the wettable sulphur used in the commercial orchard for the after-blossom application instead of Bordeaux. Spore discharge was relatively heavy during this period; (4) the fourth application of lime-sulphur was made three and four days later than the Bordeaux used in the commercial orchard and there was a fairly heavy infection during part of this period.

APPLES—CULTIVATION VERSUS SOD CULTURE

This experiment was begun in 1922 with McIntosh, Dudley and Wealthy varieties.

One block is cultivated until the early part of July, after which a cover crop is sown. Buckwheat has always been used as a cover crop and it was sown this year on July 24.

A second block is cultivated on one side of the trees one year and on the opposite side the following year. The cultivated area was sown to buckwheat on July 24 and seeded down to clover. The area in clover was cut twice during the season and the grass left on the ground as a mulch.

A third block is kept in sod. The grass was cut twice during the season and left on the ground as a mulch.

The results are shown in table 17.

TABLE 17—CULTIVATION VERSUS SOD CULTURE

Variety	Treatment	Total Number of trees in block	Total number of trees bearing age	Total number of trees bearing	Number of trees of bearing age bearing	Average yield per tree bearing age	Average yield of bearing tree bearing age
						pecks	pecks
McIntosh....	Clean cultivation with cover crop.....	5	5	5	5	2·36	2·36
"	Partial cultivation with cover crop.....	5	4	4	4	4·37	4·37
"	Sod.....	6	6	5	5	4·84	5·81
Dudley.....	Clean cultivation with cover crop.....	5	5	5	5	12·79	12·79
"	Partial cultivation with cover crop.....	10	8	9	8	12·58	12·58
"	Sod.....	9	8	9	8	8·98	8·98
Wealthy.....	Clean cultivation with cover crop.....	20	18	11	11	3·77	6·17
"	Partial cultivation with cover crop.....	19	14	11	7	2·23	4·46
"	Sod.....	19	17	13	12	2·31	3·28

GRASS MULCH VERSUS REMOVING HAY IN SOD ORCHARD

This experiment is being carried on with a block of McIntosh and Fameuse set out in 1914. In one section of the orchard the grass is cut and left on the ground as a mulch. On the other section the grass is cut and removed as hay.

The Fameuse trees in this block suffered from winter injury during 1922-23, and have since been in a rather unthrifty condition. Their general condition, however, showed some improvement during the summer, and a fairly heavy crop of fruit was produced. The results were as shown in table 18. (Project H 542.)

TABLE 18—GRASS MULCH VERSUS REMOVING HAY IN SOD ORCHARD

Variety	Treatment	Total number of trees in block	Total number of trees of bearing age	Total number of trees bearing	Number of trees of bearing age bearing	Average yield per tree bearing age	Average yield per bearing tree of bearing age
						pecks	pecks
Fameuse.....	Grass cut and left as mulch	17	17	17	17	13·28	13·28
"	Grass cut and removed as hay.....	27	24	24	24	12·71	12·71
McIntosh....	Grass cut and left as mulch	15	14	14	13	10·64	11·46
"	Grass cut and removed as hay.....	16	15	14	14	8·16	8·74

EXPERIMENTS WITH VARYING AMOUNTS OF NITRATE OF SODA IN APPLE ORCHARD

These experiments, which were begun in 1925, were continued during the year. The primary object of these experiments was to determine the effect of heavy applications of nitrate of soda on the quality of the fruit. The results will be published at a later date.

VARIETY ORCHARD

The three most promising new varieties to date are Melba, Loba and Sandow. One of the Melba trees produced a light crop and a second tree produced a heavy crop. The fruit coloured up fairly well and was of fairly good size and quality, but considerable scab developed upon it. Its season extends from September 15 to September 30.

One of the Lobo trees was badly girdled by mice during the winter. Both trees, however, produced a heavy crop of apples of good size and excellent colour. The quality of the fruit was good and its season extended from the middle of October to the middle of December.

The Sandow trees produced only a few apples, which were of good size and colour.

SMALL FRUITS

STRAWBERRIES—VARIETY EXPERIMENT

Variety tests with strawberries were carried on in one- and two-year-old plantations. The plantation set out in 1925 included a number of new varieties grown for the first time at this Station. A fairly good stand and crop were obtained from the varieties received from the Experimental Farm, Nappan. The crop from the remaining varieties was practically a failure due to the fact that a great many of the plants died during the summer after transplanting. This loss of plants was apparently due to a root rot, but laboratory examination did not reveal any specific infection that could be considered primarily responsible for this condition.

The crop for the two-year-old plantation was below the average but it was better than that from the one-year-old plantation.

The yields obtained were as shown in tables 19 and 20.

TABLE 19—STRAWBERRIES—VARIETY TEST. ONE-YEAR-OLD PLANTATION

Variety	Source	Stand	Yield per acre
			quarts
Swindle	Nappan	Good	6,971·25
Jeanne d'Arc	"	Good	6,178·7
G. H. Coughil	"	Fairly good	5,923·5
John Little	"	Fairly good	5,692·5
Gandy	"	Good	5,671·8
Seedling No. 15	"	Fairly good	5,530·0
Seedling No. 12	"	Fairly good	4,939·6
Bartons	"	Good	4,435·0
Bisel	"	Fairly good	3,988·0
Capt. Jack	"	Poor	2,111·0
McAlpine	Kentville	Fair	1,915·8
Black Beauty	Fredericton	Poor	1,897·5
Americus	Fredericton	Good	1,876·8
Stevens Late	Kentville	Good	1,711·8
Lavinia	Fredericton	Fair	1,701·5
Jersey Giant	Fredericton	Fair	1,663·7
Pocomoke	Kentville	Poor	1,628·6
Ozark	Fredericton	Fair to poor	1,608·7
Bianca	Fredericton	Fairly good	1,608·7
New Globe	Kentville	Poor	1,551·8
Billy Sunday	Fredericton	Fair to poor	1,505·6
Cassandra	"	Fair to poor	1,485·0
Glen Mary	"	Poor	1,402·5
Parsons Beauty	"	Fair to poor	1,361·25
President	"	Poor	1,350·9
Orem	Kentville	"	1,174·8
Senator Dunlap	Fredericton	"	1,096·5
Michel Early	Nappan	"	1,089·0
K. Prize	Fredericton	Fair to poor	1,000·3
Cordelia	"	Good	924·6
Williams Improved	"	Poor	907·5
K Premier	"	Poor	855·9
Viola	"	Fair to poor	845·6
Splendid	"	Poor	804·3
Warfield	"	"	701·2
Portia	"	"	598·1
Brandywine	"	"	505·3
Rewastico	"	Very poor	402·1
Dorman	Kentville	Poor	285·6
Charles I	Fredericton	Poor	257·8
Beder Wood	"	Very poor	230·3
Ophelia	"	Poor	216·5
New York	"	Poor	168·4
Sample	"	Very poor	165·0
Desdemona	Kentville	Very poor	109·3
Premier	Fredericton	Poor	35·8

TABLE 20—STRAWBERRIES—VARIETY TEST. TWO-YEAR-OLD PLANTATION

Variety	Stand	Yield per acre
		quarts
Viola	Very good	6,270·0
Senator Dunlap	"	6,022·5
Ozark	"	6,001·8
Warfield	"	5,785·3
Julia	"	5,610·0
Portia	"	5,493·1
Glen Mary	Good	5,156·25
Black Beauty	Good	4,620·0
Bianca	Very good	4,510·0
K Prize	Very good	3,918·75
Sample	Good	3,918·75
Williams Improved	"	2,763·75
Americus	"	2,732·8
Beder Wood	"	2,619·3
Lavinia	"	2,416·5
Billy Sunday	Fair to good	2,165·6
President	Fair	2,100·3
Bubach	Fair	2,041·8
K Premier	Good	1,876·8
Jersey Giant	Fair	1,815·0
Splendid	"	1,588·1
Brandywine	"	1,588·1
Cordelia	Very good	1,526·25
Charles I	Fair to good	1,402·5
Parsons Beauty	Poor	1,196·25
New York	Fair	1,155·0
Ophelia	Poor	1,062·1
Rewastico	Fair	938·4
Premier	Very poor	195·9

VEGETABLES

The work with vegetables included variety tests and cultural experiments. The land devoted to vegetables has been in garden crops continuously for several years and was fertilized with twenty loads of barn-yard manure and 1,000 pounds 4-8-6 fertilizer per acre.

BUSH BEANS—VARIETY EXPERIMENT

Twenty-one varieties of bush beans were planted on May 26. The results are shown in table 21.

TABLE 21—YIELD OF GREEN BUSH BEANS

Variety	Source	Anthracnose Infection				Ready for use	No. of plants 33 ft. row	Yield per 33 ft. row
		Aug. 4	Aug. 11	Aug. 17	Aug. 24			
								lb. oz.
Hodson Long Pod Wax	Rennie			Trace	Trace	Aug. 11	144	30 12
Round Pod Kidney Wax	McDonald	Slight	Slight	Bad	Bad	July 27	130	30 7
Refugee, or 1,000 to 1	Burpee			Bad	Bad	Aug. 11	170	28 5
Hodson Long Pod	O-2748		None	Trace	Trace	Aug. 11	170	28 0
Hodson Wax	Harris			Trace		Aug. 11	138	27 10
Sutton Masterpiece	Vaughan	Slight	Bad	Bad	Bad	July 27	167	25 14
Grenell Rustless or Golden Wax	Livingston		Slight	Bad	Slight	July 27	172	25 7
Wardwell Kidney Wax	Graham		Slight	Bad	Bad	July 27	128	24 14
Yellow Eye Yellow Pod	O-2733-7		Trace	Slight		Aug. 3	173	23 14
Round Pod Kidney Wax	O-6875	Slight	Slight	Bad	Considerable	July 27	163	23 10
Stringless Green Pod	Burpee		Trace	Bad	Bad	July 27	171	22 13
Pencil Pod Black Wax	Burpee		Slight	Bad	Bad	July 27	125	22 12
Henderson Bountiful	Dupuy & Ferguson		Bad	Bad	Bad	July 27	183	22 1
Interloper Challenge Black Wax	O-6876	Bad	Slight	Bad		July 27	173	21 13
Dwarf French or Bountiful	Will		Slight	Bad	Considerable	July 27	163	20 3
Stringless Green Pod	O-5405	Slight	Slight	Bad	Bad	July 27	167	19 15
Davis White Wax	O-1636	Slight	Considerable	Bad	Bad	July 27	67	19 7
Wardwell Kidney Wax	O-1516-65	Slight	Slight	Bad	Considerable	July 27	97	19 2
Princess Artois	O-9388		Slight	Slight		July 27	162	19 ..
Extra Early Round Pod Valentine	Steele-Briggs	Slight	Slight	Bad	Considerable	Aug. 4	135	18 13
Jones White	Fredericton	Bad	Bad	Bad		July 27	153	14 10

The Hodson Long Pod Wax (Rennie) produced the best crop of beans. Hodson Long Pod and Hodson Wax have, over a period of years, been the best yielding wax beans, and they have been relatively free from anthracnose. These varieties are rather late in the season for the early market. Round Pod Kidney Wax (McDonald) was the highest yielding early wax bean, but the crop was badly infected with anthracnose. Refugee (Burpee) was the best yielding green bean, followed by Sutton Masterpiece. The Masterpiece has, on the average, been the best yielding green bean at this Station. It has generally been free from anthracnose but this year it showed considerable infection. It is a fairly early variety. Refugee is a late variety.

BUSH BEANS—DISTANCE APART OF PLANTING IN ROWS

This experiment has been carried on four years. Two varieties of beans have been planted in rows thirty inches wide with seed spaced two, four and six inches apart. The best results have been obtained from seed planted two inches apart.

BEETS—VARIETY EXPERIMENT

Fourteen varieties were sown May 22. Detroit Dark Red (McDonald), Detroit Dark Red Turnip (Madsen) and Eclipse (McDonald) produced the highest total yields. Crosby Egyptian (Steele-Briggs), Cardinal Globe (Rennie), Detroit Blood Red (Moore), Crimson Globe (Madsen) and Detroit Dark Red (McDonald) produced the largest crops of merchantable beets. Crosby Egyptian and Detroit Dark Red were the two best varieties in 1925.

CARROTS—VARIETY EXPERIMENT

Five varieties were sown May 22. St. Valery (Rennie) produced the largest crop of merchantable carrots. It was followed by Oxheart (Steele-Briggs) and Chantenay (0-6049). The St. Valery carrot has only been grown two years at this Station, and in each year it has led in the production of merchantable crop.

Oxheart produced the largest total crop, followed by St. Valery.

CARROTS—DATES OF PLANTING

Chantenay carrots were sown May 20, and thereafter at intervals of ten days until June 30. The June 1 seeding produced the largest crop of bunch carrots and also the largest crop up until September 1. The June 10 seeding produced the largest total crop and also the largest merchantable crop when the carrots were left in the ground until fall.

CABBAGE—VARIETY EXPERIMENT

Twenty varieties of cabbage were grown. Golden Acre (Keith) (Dreer), ready for use July 29, was the earliest variety. It was followed by Dala (McDonald), Copenhagen Market (Graham) (James), Golden Acre (Harris) and Early Jersey Wakefield (McDonald), which were ready for use August 11.

Dala (McDonald) was the heaviest yielder of the early varieties with heads averaging 7.0 pounds. It was followed by Copenhagen Market (Graham) (James) and Golden Acre (Keith). Danish Ballhead Short Stem (Steele Briggs) with heads averaging 10.04 pounds, was the heaviest yielding late variety. It was followed by Summer Ballhead (Harris), a mid-season variety, Danish Roundhead (Dupuy & Ferguson), Succession (Ewing), a mid-season variety, Marblehead Mammoth (Ewing) and Danish Ballhead (Lethbridge). These are all good varieties of cabbage which can be recommended for their respective seasons.

CUCUMBER—VARIETY EXPERIMENT

Seven varieties of cucumbers were grown. Improved Long Green (McDonald) produced the largest crop. It was followed by Early Russian (Burpee), Davis Perfect (Graham) and Fordhook Famous (MacDonald). These varieties can be recommended for general planting.

CORN—VARIETY EXPERIMENT

Twenty-six varieties were sown May 29. Banting (0-6654) and Pickaninny (0-6579), ready for use August 28, were the earliest varieties and can be recommended for those districts in which the season is short for growing corn. Golden Bantam (James) and Early Malcolm (0-8205), ready for use September 8 and 13, produced the largest number of ears before frost. Both of these varieties can be recommended for general culture in a season of average length.

CORN—SUCKERING EXPERIMENT

Experiments have been carried on for three years with Golden Bantam and Early Malcolm corn to determine if removing the suckers had any effect on the yield and maturity of the crop. The results this year, as well as the average results, are in favour of allowing the suckers to develop.

PARSNIP—DATES OF SEEDING

Hollow Crown parsnips were sown May 20, and thereafter at intervals of ten days until June 30. The results this year, as well as in previous years, were in favour of the early seeding.

PEAS—VARIETY EXPERIMENT

Twenty-two varieties of peas were sown on May 19. The results are shown in table 22.

TABLE 22—PEAS—VARIETY EXPERIMENT

Variety	Source	Ready for use	Yield per 66-foot row	
			lb.	oz.
Director	Invermere	Aug. 2	71	4
Lincoln	Invermere	" 2	64	8
Advancer	Harris	" 2	54	6
Seedling No. 3	Invermere	" 2	54	0
Seedling No. 6	Invermere	July 28	53	6
Bruce	Invermere	Aug. 5	51	8
Lincoln	Sharpe	" 2	50	2
Gregory Surprise X English Wonder	0-6471-3	July 28	49	3
English Wonder	0-8622	" 28	47	8
Little Marvel	Rennie	" 28	45	5
Blue Bantam	Graham	" 28	43	2
Prosperity	Rennie	" 28	39	9
Daisy	Patmore	Aug. 5	38	7
Thomas Laxton	McDonald	July 22	38	5
Early Morn	Gregory	" 28	37	0
Laxtonian	Graham	" 22	36	5
Alaska	Vaughan	" 22	35	7
Sutton Excelsior	Harris	" 28	35	6
Gradus	Andrews Mountain	" 28	35	5
Gradus X American Wonder	0-3584	" 28	33	3
Gregory Surprise	Gregory	" 22	26	8
Telephone	Dupuy & Ferguson	Aug. 2	25	7

Thomas Laxton was the best yielder of the early varieties. It was followed by Laxtonian, Alaska, and Gregory Surprise.

Seedling No. 6 was the best yielding medium early variety. It was followed by Gregory Surprise X English Wonder, English Wonder, Little Marvel, Blue Bantam, and Prosperity.

Director was the best yielding late variety. This is a new variety originated at the Experimental Station, Invermere, and it has always done well at this Station. It was followed by Lincoln (Invermere) Seedling No. 3, Seedling No. 6, Bruce and Lincoln (Sharpe). Bruce originated at the Experimental Station, Invermere.

PEAS—DISTANCE APART OF PLANTING

This experiment has been carried on for four years with three varieties of peas. These have been grown in rows thirty inches wide with the seed spaced one, two and three inches apart in the row. The results this year, as well as for the previous years, have been in favour of the close planting.

SQUASH—VARIETY EXPERIMENT

Ten varieties of squash were grown. Golden Hubbard (Harris) (C.E.F.) and (McDonald) produced the largest yields, followed by Warty Hubbard (Steele-Briggs) and Delicious (Graham). These varieties can be recommended for general planting.

TOMATOES—VARIETY EXPERIMENT

Thirty-three varieties of tomatoes were grown. Bonny Best (Moore) produced the largest amount of ripe fruit, followed by Wayahead (Bruce), Alacrity X Earlibell (0-6570), Avon Early (Ferry), Sparks Earliana (Burpee), Avon Early (Vaughan), Prosperity (Patmore), Alacrity (0-6560), Danish Export (Wibolt) and Bonny Best (Bruce).

Alacrity (0-6560) produced the largest amount of ripe fruit up until September 1. It was followed by Wayahead (Bruce), Alacrity X Hippers (0-6568), Bolgiano (Bolgiona), Michigan Star (R. D. Taylor), Danish Export (Wibolt), Pink No. 2 (0-6569), Sunnybrook Earliana (Burpee) Avon Early (Vaughan) and Prosperity (Patmore).

Wayahead (Bruce) produced the largest amount of ripe fruit up until September 15. It was followed by Alacrity (0-6560), Avon Early (Ferry), Alacrity X Hipper (0-6568) Alacrity X Earlibell (0-6570) and Prosperity (Patmore), Avon Early (Vaughan), Early Mascot (Graham) Bolgiona (Bolgiano) Danish Export (Wibolt) Pink No. 2 (0-6569) and Bonny Best (Bruce).

POTATOES—DIFFERENT DATES OF PLANTING TO OBTAIN THE BEST YIELDS

In order to determine the best date for planting potatoes, Green Mountain potatoes were planted on the dates shown in table 23. The results are shown in the same table. (Project H 162.)

TABLE 23—POTATOES—DIFFERENT DATES OF PLANTING TO OBTAIN BEST YIELDS

Variety	Date planted	Per cent stand	Yield per acre		
			Merchantable	Small	Total
			lb.	lb.	lb.
Green Mountain	June 1	90·1	17,820	1,210	19,030
Green Mountain	" 11	87·1	17,600	1,320	18,920
Green Mountain	" 21	89·3	22,110	990	23,100
Green Mountain	July 1	60·6	10,450	990	11,440

This experiment has been carried on for three years. Plantings have been made as soon as the ground was in condition, and thereafter at intervals of ten days until the last week of June. The best crop was obtained this year from the June 21 planting. The average yield for three years is in favour of plantings made as soon as the ground was in good working condition.

Three years' experiments with Irish Cobblers has resulted in a slightly better average for the second planting, with the first planting a close second.

POTATOES—SPROUTED VERSUS NOT SPROUTED FOR EARLINESS

Green Mountain and Irish Cobbler potatoes were taken from the cellar on April 1 and kept in a room where the temperature was between 40 and 50 degrees F, and the light subdued. They were kept under these conditions until June 7, by which time they had developed short, thick, green sprouts. They were then planted in comparison with a similar lot of potatoes taken direct from the potato cellar in order to determine the effect of sprouting on earliness and yield. The soil was a clay loam fertilized with 750 pounds 4-8-6 fertilizer and eighteen tons barnyard manure per acre. The results are shown in table 24. (Project H 183.)

TABLE 24—POTATOES—SPROUTED VERSUS NOT SPROUTED FOR EARLINESS

Variety	Date dug	Yield per acre					
		With sprouts			Without sprouts		
		Merchantable	Small	Total	Merchantable	Small	Total
		lb.	lb.	lb.	lb.	lb.	lb.
Irish Cobbler	Aug. 30	15,905·5	3,225·5	19,131·0	14,103·5	3,799·0	17,902·5
Irish Cobbler	Sept. 30	17,435·0	4,070·0	21,505·0	19,195·0	1,760·0	20,955·0
Green Mountain	Aug. 31	13,582·0	1,991·0	15,573·0	11,875·5	2,560·5	14,436·0
Green Mountain	Oct. 5	20,020·0	990·0	21,010·0	19,195·0	1,485·0	20,680·0

Sprouting increased the crop of Cobblers for early digging. For the late digging the crop was larger where the seed was not sprouted. In 1925 the yields from sprouted and unsprouted Cobblers were practically the same. In 1924 an increase of about six barrels per acre was obtained from the sprouted seed for the early crop, while for the late crop the unsprouted seed gave the best yield. In 1923 the sprouted seed gave a decided increase in yield for the early digging and a small increase for the late digging.

Sprouting has always increased the crop of Green Mountains.

POTATOES—DIFFERENT DATES OF PLANTING TO OBTAIN BEST SEED

In order to determine the effect of the maturity of seed potatoes on the resultant crop, Green Mountain and Irish Cobbler potatoes were planted for seed purposes on different dates in 1925. The progeny of these potatoes planted on different dates in 1925 was planted June 8, 1926. The soil was a medium clay loam fertilized with eighteen loads barnyard manure and 750 pounds 4-8-6 fertilizer per acre. The results are shown in table 25. (Project H 161.)

TABLE 25—POTATOES—DIFFERENT DATES OF PLANTING TO OBTAIN BEST SEED

Variety	Date planted 1925	Per cent stand	Yield per acre		
			Merchantable	Small	Total
			lb.	lb.	lb.
Irish Cobblers	May 16	98·8	17,407·0	2,447·0	19,854·0
Irish Cobblers	" 25	98·8	17,490·0	2,530·0	20,020·0
Irish Cobblers	June 5	98·5	15,455·0	4,180·0	19,635·0
Irish Cobblers	" 15	99·6	15,593·0	2,758·5	18,351·5
Irish Cobblers	" 25	99·6	17,270·0	2,090·0	19,360·0
Green Mountain	May 16	98·1	17,985·0	1,870·0	19,855·0
Green Mountain	" 26	90·9	16,720·0	1,650·0	18,370·0
Green Mountain	June 5	98·4	17,875·0	2,530·0	20,405·0
Green Mountain	" 15	98·8	17,820·0	2,145·0	19,965·0
Green Mountain	" 25	97·3	18,755·0	1,650·0	20,405·0

Irish Cobbler potatoes yielded practically the same merchantable crop from seed produced from plantings made May 16, May 25 and June 25. The merchantable crop from seed produced from June 5 and June 15 plantings was lower.

Green Mountain potatoes yielded practically the same merchantable crop from seed produced from plantings made May 16, June 5 and June 15. The stand from May 26 planted seed was for some unaccountable reason below the average and the yield from this plot was also lower than the average. The merchantable crop from the June 25 planted seed was slightly higher than that from any of the other plantings.

The average results to date indicate that Irish Cobbler seed from late plantings will give a little better yield than seed from early plantings. Seed from late planted Green Mountains has not increased the yield on the average.

POTATOES—DIFFERENT DATES OF DIGGING TO OBTAIN BEST SEED

Green Mountain potatoes planted on May 16, 1925, were dug on two different dates to determine if the maturity of the potatoes as influenced by time of digging had any effect on the yielding ability of the seed. The 1926 planting was made on June 8. The results are shown in table 26. (Project H 170.)

TABLE 26—POTATOES—DIFFERENT DATES OF DIGGING TO OBTAIN BEST SEED

Variety	When dug	Per cent stand	Yield per acre		
			Merchantable	Small	Total
			lb.	lb.	lb.
Green Mountain	Aug. 17	98·4	18,755·0	2,420·0	21,175·0
Green Mountain	Sept. 30	90·5	16,170·0	1,540·0	17,710·0

Green Mountain potatoes dug early produced a better crop than potatoes dug late in the season. In 1925 the crop from early dug potatoes was larger but the difference was only about nine hundred weight per acre.

POTATOES—DISTANCE APART OF ROWS

In order to determine the width of rows that will give the best results, Green Mountain potatoes were planted in plots with rows 2, 2½, 3 and 3½ feet apart. Planting was done with a potato planter adjusted to plant sets one foot apart. The results are shown in table 27. (Project H 165.)

TABLE 27—POTATOES—DISTANCE APART OF ROWS

Width of Rows	Per cent stand	Yield per acre		
		Merchantable	Small	Total
ft.		lb.	lb.	lb.
2	73·3	21,001	2,716	23,717
2½	73·0	21,856	1,978	23,834
3	73·4	17,525	1,671	19,196
3½	73·9	18,475	1,332	19,807

The results of four years experiments indicate that where the sets are equally spaced in the rows the yield decreases with the increase in the width of the rows. A row two feet wide cannot be conveniently worked, hence a row two and one half feet wide is to be recommended for commercial potato culture.

POTATOES—CULTIVATION EXPERIMENT

In order to obtain data on the value of cultivation for the potato crop, plots of Green Mountain potatoes were cultivated once, twice, three, and four times. These potatoes were grown on a medium clay loam which had been in hay the previous year and which apparently was not very weedy. The results are shown in table 28. (Project H 166.)

TABLE 28—POTATOES—CULTIVATION EXPERIMENT

Number of times cultivated	Per cent stand	Yield per acre		
		Merchantable	Small	Total
		lb.	lb.	lb.
1	79·1	17,672	1,972	19,644
2	78·2	17,651	2,240	20,091
3	73·6	18,017	1,789	19,806
4	73·9	16,390	1,586	17,976

Three cultivations produced a very slight gain in merchantable crop over one and two cultivations. The results have been somewhat variable from year to year. The average results for five years show practically the same merchantable crop from one, two and three cultivations with the average from four cultivations slightly lower. At this Station potatoes are grown in a three-year rotation, hence the ground is comparatively free from weeds. The soil is a medium clay loam and it seldom suffers for want of moisture, hence frequent cultivations have not resulted in an increase in the average yield. Where the land is weedy and liable to suffer from lack of moisture, careful cultivation would be necessary.

METHOD OF APPLYING FERTILIZER FOR THE POTATO CROP

In order to determine the best method of applying fertilizer for the potato crop, a 4-8-6 fertilizer was applied (1) broadcast, (2) in the row and mixed with earth, (3) in the row in direct contact with the seed. Applications were made at the rate of 1,000, 1,500 and 2,000 pounds per acre. The soil was a medium clay loam which was in hay the previous year. Planting was done on June 5. The field in which this experiment was carried on received an application of eighteen loads of barnyard manure per acre, hence no comparison should be made between the yields from plots receiving different amounts of fertilizer. The results are shown in table 29. (Project H 383.)

TABLE 29—METHOD OF APPLYING FERTILIZER FOR THE POTATO CROP

Method of application	Rate of application	Per cent stand	Yield per acre		
			Merchantable	Small	Total
	lb.		lb.	lb.	lb.
Broadcast	1,000	99·4	18,984·0	1,246·0	20,230·0
In the row in direct contact with seed	1,000	97·4	20,523·5	1,612·0	22,135·5
In the row and mixed with earth	1,000	97·9	20,083·5	1,759·0	21,842·5
Broadcast	1,500	98·9	18,984·5	1,245·5	20,230·0
In the row in direct contact with seed	1,500	90·4	18,691·0	1,172·5	19,863·5
In the row and mixed with earth	1,500	95·9	20,743·5	1,319·0	22,062·5
Broadcast	2,000	97·4	19,863·5	1,245·5	21,109·0
In the row in direct contact with seed	2,000	94·4	20,304·0	1,025·5	21,329·5
In the row and mixed with earth	2,000	94·9	20,157·0	1,172·5	21,329·5

When applications of 1,000 pounds per acre were made, a slightly better stand was obtained from the broadcast application. The yields, however, were slightly better where the fertilizer was applied in the row.

Where applications of 1,500 pounds per acre were made the application in the row in direct contact with the seed apparently depressed the stand. Applications in the row and mixed with earth resulted in a slightly lower stand than where application was made broadcast. The yield was in favour of applications in the row mixed with earth.

Where applications of 2,000 pounds per acre were made a slightly better stand was obtained from the broadcast application. The yields, however, were in favour of applications in the row.

This experiment has been carried on for three years with applications of 1,000 and 1,500 pounds per acre, and for four years with an application of 2,000 pounds per acre. The average results are shown in table 30.

TABLE 30—METHOD OF APPLYING FERTILIZER

Year	Rate of application	Broadcast				In the row in direct contact with Seed				In the row mixed with Earth			
		Per cent stand	Yield per acre			Per cent stand	Yield per acre			Per cent stand	Yield per acre		
			Merchantable	Small	Total		Merchantable	Small	Total		Merchantable	Small	Total
	lb.		lb.	lb.	lb.		lb.	lb.	lb.		lb.	lb.	lb.
1924	1,000	73·8	24,263·0	1,123·0	25,386·0	71·6	26,054·0	1,449·0	27,503·0	72·6	24,304·0	1,489·0	25,794·0
1925	1,000	74·33	18,411·0	1,568·0	19,979·0	72·66	18,469·0	2,003·0	20,472·0	74·49	18,933·0	2,090·0	21,023·0
1926	1,000	99·4	18,984·0	1,246·0	20,230·0	97·4	20,523·5	1,612·0	22,135·5	97·9	20,083·5	1,759·0	21,842·5
Average		82·51	20,552·6	1,312·3	21,865·0	80·55	21,682·1	1,688·0	23,370·1	81·66	21,106·8	1,779·3	22,886·5
1924	1,500	72·1	26,027·0	732·0	26,760·0	72·6	22,675·0	879·0	23,554·0	72·5	25,728·0	1,123·0	26,851·0
1925	1,500	74·66	18,614·0	1,916·0	20,530·0	70·16	17·423·0	2,148·0	19,571·0	71·16	17,481·0	2,351·0	19,832·0
1926	1,500	98·9	18,984·5	1,245·5	20,230·0	90·4	18,691·0	1,172·5	19,863·5	95·9	20,743·5	1,319·0	22,062·5
Average		81·8	21,208·5	1,297·8	22,506·0	77·7	19,596·3	1,399·8	20,996·1	79·85	21,317·3	1,597·6	22,915·1
1923	2,000	81·4	17,123·8	1,962·5	19,086·3	57·6	13,699·0	885·0	14,584·0	71·9	17,893·4	1,154·4	19,047·8
1924	2,000	84·25	25,213·0	1,411·0	26,624·0	72·0	25,430·0	977·0	26,407·0	79·3	28,470·0	868·0	29,338·0
1925	2,000	75·99	18,730·0	1,626·0	20,356·0	67·33	17,452·0	1,800·0	19,252·0	66·66	18,411·0	1,480·0	19,891·0
1926	2,000	97·4	19,863·5	1,245·5	21,109·0	94·4	20·304·0	1,025·5	21,329·5	94·9	20,157·0	1,172·5	21,329·5
Average		84·76	20,232·5	1,561·2	21,793·8	72·8	19,221·2	1,171·8	20,393·1	78·19	21,232·8	1,168·7	22,401·5

The average results indicate that when 1,500 and 2,000 pounds of fertilizer per acre are applied for the potato crop the best results will be obtained when the fertilizer is applied in the row and mixed with earth.

In order to obtain data on what constituents in the fertilizer caused injury, if any, experiments were carried on applying nitrate of soda, sulphate of ammonia, acid phosphate, and muriate of potash in the row in direct contact with the seed in such quantities as would be applied in a ton of 4-8-10 mixture. The other constituents such as would be found in a ton of 4-8-10 mixture made with the above chemicals were applied broadcast. The results are shown in table 31.

TABLE 31—TO DETERMINE SOURCES OF FERTILIZER INJURY

Chemical applied in the row in contact with seed	Rate per acre	Per cent stand	Yield per acre		
			Merchantable	Small	Total
	lb.		lb.	lb.	lb.
Nitrate of soda	533	94·4	19,057·5	1,538·5	20,596·0
Sulphate of ammonia	400	92·9	19,131·0	1,612·5	20,743·5
Acid phosphate	1,000	99·4	21,036·5	1,539·0	22,575·5
Muriate of potash	400	97·4	18,324·5	1,685·5	20,010·0

Sulphate of ammonia and nitrate of soda in direct contact with the seed apparently reduced the per cent stand. Where muriate of potash was used in the row in contact with the seed the stand was slightly below perfect, and the lowest yield was obtained. The best results were obtained with acid phosphate applied in the row, and the other chemicals applied broadcast.

In order to determine whether fertilizer was best applied above or below the sets, experiments were carried on with one ton of 4-8-6 fertilizer applied above and below the sets. The results are shown in table 32.

TABLE 32—FERTILIZER APPLIED ABOVE AND BELOW SETS

—	Per cent stand	Yield per acre		
		Merchantable	Small	Total
		lb.	lb.	lb.
Fertilizer applied above sets	96·9	20,743·5	1,465·5	22,209·0
Fertilizer applied below sets	97·4	21,623·0	1,465·5	23,088·5

POTATOES—SMALL VERSUS LARGE FOR SEED PURPOSES

In order to determine the value of small potatoes for seed purposes, the following experiments were carried on:—

(1) Green Mountain potatoes of commercial size were cut in sets of average size.

(2) Green Mountain potatoes weighing as near as possible one ounce (average 1.16 ounces) were planted whole.

(3) Green Mountain potatoes weighing as near as possible two ounces (average 1.9 ounces) were planted whole.

(4) Green Mountain potatoes weighing as near as possible two ounces (averaging 1.87 ounces) were cut in two for seed.

(5) Green Mountain potatoes weighing as near as possible three ounces (averaging 2.98 ounces) were planted whole.

(6) Green Mountain potatoes weighing as near as possible three ounces, (averaging 3.08 ounces) were cut in two for seed.

These were planted in a medinum clay loam, fertilized with eighteen loads barnyard manure and 750 pounds 4-8-6 fertilizer per acre. The results were as shown in table 33.

TABLE 33—SMALL VERSUS LARGE POTATOES FOR SEED PURPOSES

Variety	Kind of seed used	Yield per acre		
		Merchantable	Small	Total
		lb.	lb.	lb.
Green Mountains	Commercial size cut in sets	21,725	1,705	23,430
Green Mountains	Average weight 1·16 ounces, planted whole	19,525	2,255	21,780
Green Mountains	Average weight 1·9 ounces, planted whole	21,615	1,980	23,595
Green Mountains	Average weight 1·87 ounces, cut in two	20,680	1,705	22,385
Green Mountains	Average weight 2·98 ounces, planted whole	22,220	2,695	24,915
Green Mountains	Average weight 3·08 ounces, cut in two	21,560	2,420	23,980

The yield of merchantable potatoes from potatoes of commercial size cut in sets, was practically the same as that from two ounce potatoes planted whole, and three ounce potatoes when planted whole or cut in two. Experiments have been carried on for five years using potatoes from two to three ounces in size, in comparison with sets cut from potatoes of commercial size. The average results do not show any reduction in the merchantable yield from the use of the smaller sized potatoes. It must be borne in mind that the seed used was always from a vigorous crop relatively free from such diseases as leaf roll, Mosaic, spindle tuber, and black leg. The use of small potatoes from a crop infected with any of these diseases would tend to further distribute the infection, lower the vitality of the crop, and the resultant yield.

Two and three ounce potatoes planted whole produced a slightly larger yield than when cut in two. Similar results were obtained in previous years.

In order to determine the effect of the continuous use of small potatoes for seed purposes, experiments begun in 1925 and 1923 were continued.

A. STUDY OF YIELDS FROM SMALL VERSUS LARGE POTATOES IN SECOND GENERATION

(1) Irish Cobblers of commercial size, average weight 6.8 ounces, were cut into sets and grown in 1925. From the progeny of these, potatoes of commercial size, average weight 6.3 ounces, were cut into sets and planted in 1926.

(2) Irish Cobblers weighing from 2½ to 3¼ ounces, average weight 2.8 ounces, were planted in 1925. From the progeny of these, small potatoes, as nearly uniform in size as possible, weighing an average of 1.8 ounces, were selected and grown in 1926. These were planted whole.

(3) Green Mountain potatoes weighing from six to eight ounces, average weight 6.8 ounces, were cut into sets and planted in 1925. From the progeny of these, potatoes of commercial size, averaging 5.8 ounces, were selected and grown in 1926. These were cut into sets averaging 1.51 ounces.

(4) Green Mountain potatoes weighing from 2½ to 3¼ ounces were planted in 1925. From the progeny of these, small potatoes averaging 1.6 ounces were selected and grown in 1926.

These were grown in a medium clay loam, fertilized with eighteen loads of barnyard manure and 750 pounds 4-8-6 fertilizer per acre. The results are shown in table 34.

TABLE 34—SMALL VERSUS LARGE POTATOES FOR SEED PURPOSES IN SECOND GENERATION

Variety	Kind of seed used	Per cent stand	Yield per acre		
			Merchantable	Small	Total
			lb.	lb.	lb.
Irish Cobblers	Commercial (6·3 ounces) from commercial (6·8 ounces) cut in sets	93·7	16,335	2,722	19,057
Irish Cobblers	Small (1·8 ounces) from seconds (2·8 ounces) planted whole	98·9	17,005	5,131	22,136
Green Mountains	Commercial (5·8 ounces) from commercial (6·8 ounces) cut in sets	89·3	14,520	2,420	16,940
Green Mountains	Small (1·6 ounces) from seconds (2·8 ounces) planted whole	100·	16,720	4,400	21,120

The results do not show any reduction in merchantable yield from the use of the smaller sized potatoes for seed, when selected from a crop grown from small potatoes.

The seed used was from vigorous growing crops relatively free from infectious diseases. Satisfactory yields could not be expected from the use of small seed from diseased fields.

B. STUDY OF YIELDS FROM SMALL VERSUS LARGE POTATOES IN FOURTH GENERATION

(1) Green Mountain potatoes averaging about 8 ounces in weight were selected and grown in 1923. From the progeny of this crop potatoes averaging 5.2 ounces were selected and propagated. From the progeny of these, potatoes averaging 8.08 ounces were selected and grown in 1925. From the progeny of these, potatoes of commercial size averaging 6.3 ounces were selected and grown in 1926. These were cut in sets of commercial size.

(2) Small potatoes, hereafter called seconds, averaging 3 ounces were planted in 1923. From the resultant crop, potatoes averaging 2 ounces were selected and grown in 1924. From the 1924 crop potatoes averaging 2.56 ounces were selected and grown in 1925. From the 1925 crop potatoes averaging 1.87 ounces were selected and grown in 1926.

(3) From the 1924 crop of potatoes mentioned in the previous paragraph, potatoes averaging 1.57 ounces were selected and grown in 1925. From the progeny of these, potatoes averaging 1.15 ounces were selected and grown in 1926.

(4) Small potatoes averaging 1.5 ounces were selected and planted in 1923. From the progeny of these, potatoes averaging 2.2 ounces were selected and grown in 1924. From the 1924 crop potatoes averaging 1.73 ounces were selected and grown in 1925. From the 1925 crop potatoes averaging 1.3 ounces were selected and grown in 1926.

The results were as shown in table 35.

TABLE 35—SMALL VERSUS LARGE POTATOES FOR SEED PURPOSES IN FOURTH GENERATION

Variety	Kind of Seed Used	Per cent stand	Yield per acre		
			Merchantable	Small	Total
			lb.	lb.	lb.
Green Mountains.....	Commercial (6·3 ounces) from commercial (8·08 ounces) from commercial (5·2 ounces) from commercial (8 ounces).....	95·4	18,260	2,860	21,120
" "	Small (1·87 ounces) from seconds (2·56 ounces) from seconds (2 ounces) from seconds (3 ounces).....	100·0	16,720	4,400	21,120
" "	Small (1·15 ounces) from small (1·57 ounces) from seconds (2 ounces) from seconds (3 ounces).....	100·0	20,680	3,080	23,760
" "	Small (1·3 ounces) from small (1·75 ounces) from seconds (2·2 ounces) from small (1·5 ounces).....	98·4	16,940	3,960	20,900

The continuous selection of small potatoes, such as previously described, for four years, apparently resulted in a reduction of the merchantable crop in two of the plots and an increase in the third plot. It also resulted in an increased percentage of small potatoes with the total yield practically the same.

The average merchantable yield from the three plots grown from the small potatoes was practically the same as where potatoes of commercial size thus selected for four years was used.

In order to determine the results from the selection of potatoes of commercial size grown from potatoes averaging 1.75 ounces grown from potatoes averaging 2.2 ounces grown from potatoes averaging 1.5 ounces, plots were planted as shown in table 36. The commercial potatoes were cut in sets of the usual size and the small were planted whole. The results of selecting potatoes of commercial size from a crop grown for three years from small potatoes were practically the same as where potatoes of commercial size grown for three years from potatoes of commercial size were used.

TABLE 36—SMALL VERSUS LARGE POTATOES FOR SEED PURPOSES—COMMERCIAL SELECTION FROM SMALL POTATOES. 3RD GENERATION

Variety	Kind of Seed Used	Per cent stand	Yield per acre		
			Merchantable	Small	Total
			lb.	lb.	lb.
Green Mountains.....	Commercial (6·3 ounces) from commercial (8·08 ounces) from commercial (5·2 ounces) from commercial (8 ounces).....	95·4	18,260	2,860	21,120
" "	Small (1·3 ounces) from small (1·75 ounces) from seconds (2·2 ounces) from small (1·5 ounces).....	98·4	16,940	3,960	20,900
" "	Commercial from small (1·75 ounces) from seconds (2·2 ounces) from small (1·5 ounces).....	96·2	18,480	2,970	21,450

CEREAL

The experimental work with grain this season included variety tests of spring wheat, oats, barley, beans, peas and buckwheat; and tests of various mixtures of wheat, oats and barley; and of oats and barley. Tests were also conducted with different selections of wheat, barley and buckwheat. The oats and wheat were treated with copper carbonate (2 ounces to a bushel of grain).

The 1/100 acre test plots of wheat, oats, barley and peas, as well as those of the various grain mixtures, were located on a light clay loam which grew a crop

of potatoes the previous year. For the potato crop this land was manured with 15 tons barnyard manure and 950 pounds of 4-8-6 home-mixed fertilizer per acre. This year the land was spring-ploughed and put in good tilth with a disk and smoothing harrow.

In order to obtain field conditions the two outside rows on both sides of each plot were removed at harvest time and discarded, while a foot was trimmed off each of the two ends. The size given represents the size after the sides and ends were removed. Except where otherwise stated, the plots were 1/100 of an acre.

SPRING WHEAT—VARIETY TEST

Six varieties of wheat were sown on May 31. Ruby and Early Russian were tested in triplicate, and the other four varieties were sown in quadruplicate plots of 1/100 acre each. The seed germinated well, but owing to cool weather and high wind in June and July, the growth was slow and the stooling was poor. August was wet. This caused considerable lodging in the Early Russian. Stem rust and leaf rust was noticed on all the varieties, but was not as severe on Huron and White Russian. The yields are shown in table 37.

TABLE 37—SPRING WHEAT—VARIETY TEST

Name of variety	No. of days maturing	Average length of straw including head	Strength of straw on scale of 10 points	Yield of grain per acre	Weight per measured bushel after cleaning	Average yield last 6 years
		inches		bush. lb.	lb.	bush. lb.
Huron, Ottawa 3	107	37·75	10·0	13 20	61·5	21 7
White Russian	116	38·0	8·75	12 52	58·5	21 42
Early Red Fife Ottawa 16	106	37·0	9·0	10 49	60·0	19 48
Early Russian Ottawa 40	100	35·0	7·33	10 9	60·0	.....
Marquis, Ottawa 15	101	32·25	9·0	7 49	59·5	18 26
Ruby, Ottawa 623	94	29·66	9·0	7 49	60·0	16 55

OATS—VARIETY TEST

Five varieties of oats were sown in quadruplicate plots of 1/100 acre each on May 31. Laurel, which is a hulless variety, was sown at the rate of 2½ bushels per acre. The other varieties were sown at the rate of 3 bushels per acre. Good stands were secured but the yields were low. Gold Rain gave the largest yield. This variety seems to be able to withstand unfavourable conditions better than either the Victory or Banner. It has outyielded Victory twice and Banner four times in the six years which it has been grown at this Station. Victory has outyielded every other variety nine times in the last twelve years which it has been grown at this Station. The yields are shown in table 38.

TABLE 38—OATS—VARIETY TESTS

Name of variety	Number of days maturing	Average length of straw including head	Strength of straw on scale of 10 points	Yield of grain per acre	Weight per measured bushel after cleaning	Per cent hull	Yield of kernel per acre	Average yield last 6 years
		inches		bush. lb	lb.		lb.	bush. lb.
Gold Rain	100	38·75	8·5	49 14	37·5	27·31	1,221	61 26
Banner, Ottawa 49	106	38·25	8·75	45 33	35·5	28·48	1,118	59 28
Victory	106	38·25	9·0	44 20	38·5	27·72	1,096	64 0
Alaska	91	39·0	8·0	33 19	36·0	23·12	877	.....
Laurel, Ottawa 477	93·25	36·5	9·0	27 28	47·0	.....	946	.....

BARLEY—VARIETY TESTS

Five varieties of barley were tested this year. Charlottetown No. 80, Duckbill and Gold were sown at the rate of 2½ bushels per acre. The other varieties were sown at the rate of 2 bushels per acre. The barleys were sown on May 31 in quadruplicate plots of 1/100 acre each. Charlottetown gave the largest yield. It is a heavy stooler and has outyielded every other variety four of the six years it has been grown at this Station. Duckbill has been a poor stooler and yielder during the eight years it has been grown at this Station. Himalayan is a hulless variety and has rather brittle straw. The yields are shown in table 39.

TABLE 39—BARLEY—VARIETY TESTS

Name of variety	No. of days maturing	Average length of straw including head	Strength of straw on scale of 10 points	Yield of grain per acre	Weight per measured bushel after cleaning	Average yield last 6 years
		inches		bush. lb.	lb.	bush. lb.
Charlottetown No. 80	103·5	32·75	9·0	31 0	51·0	38 27
O. A. C. No. 21	91·0	33·75	7·75	26 27	45·0	31 42
Gold	91·75	27·75	9·0	18 44	50·0	.....
Himalayan, Ottawa 59	84·0	23·33	6·0	14 7	59·0	23 34
Chinese, Ottawa 60	91·75	32·75	7·75	12 32	42·5	30 14
Duckbill, Ottawa 57	100·0	25·5	10·0	5 19	46·0	23 31

GRAIN MIXTURES

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

BARLEY, WHEAT AND OATS COMBINATION

On May 31 duplicate plots of 1/100 acre each were sown with Huron wheat, Victory oats and Charlottetown No. 80 barley in combination, at rates shown in table 40. This year the mixture gave larger yields than the same grains sown alone. In 1925, however, the grains when sown alone gave equally good yields. The yields for 1925 and 1926 are shown in table 40.

TABLE 40—BARLEY, WHEAT AND OATS—SOWN IN COMBINATION

Mixture per acre, bushels	Number of days maturing	Yield of grain per acre 1926	Yield of grain per acre 1925
		lb.	lb.
Wheat 1, oats 1, barley 1	110	1,563	2,250
Wheat ½, oats 1, barley 1	110	1,825	2,550
Wheat ½, oats 2, barley 1	110	2,088	2,383
Huron wheat 1¾	107	800	1,400
Victory oats 3	106	1,516	2,637
Charlottetown No. 80, barley 2½	103·5	1,488	2,250

BARLEY AND OATS COMBINATION

On May 31 duplicate plots of 1/100 acre each were sown with Victory oats and Charlottetown No. 80 barley in combination, at the rates shown in table 41. This year the mixture gave larger yields than the same grains sown alone. In 1925, however, the grain when sown alone gave equally good yields. The yields for 1925 and 1926 are shown in table 41.

TABLE 41—BARLEY AND OATS—SOWN IN COMBINATION

Mixture per acre, bushels	Number of days maturing	Yield of grain per acre 1926	Yield of grain per acre 1925
		lb.	lb.
Oats 1, barley 1	110	1,694	2,250
Oats 1½, barley 1½	110	2,069	2,266
Oats 2, barley 1	110	2,301	2,416
Victory oats, 3 bush	106	1,516	2,637
Charlottetown No. 80 barley, 2½	103·5	1,488	2,250

BEANS—VARIETY TEST

Eight varieties of beans were tested this year. The land on which they were grown grew a crop of rape which was used to pasture sheep the previous year. For that crop the land was given an application of fifteen tons barnyard manure per acre. This year the land was ploughed, harrowed, and ribbed up into 30-inch drills. The beans were sown in quadruplicate plots on June 3. All the beans were affected with anthracnose. Beauty and Large White were so badly affected that they were worthless. Yellow Eye and Soldier and Marrowfat were the only ones which were salable. The yields are shown in table 42.

TABLE 42—BEANS—TEST OF VARIETIES

Name of variety	Date of ripening	Number of days maturing	Average length of straw	Average length of pod	Yield per acre	Weight per measured bushel after cleaning
			inches	inches	bush. lb.	lb.
White Marrowfat	Oct. 4	123	12·7	3·56	34 35	63·5
Navy, O-711	Oct. 2	121	18	3·75	30 45	67·0
Norwegian, O-710	Sept. 30	119	10·7	4·5	29 45	61·3
Yellow Eye, Kentville	Oct. 2	121	13·5	4·0	29 30	67·0
White Pea	Oct. 4	123	16·0	3·6	28 11	66·5
Soldier	Sept. 30	119	11·5	5·44	27 50	66·5
Large White, O-713	Sept. 30	119	11·7	3·69	19 32	63·5
Beauty, O-712	Sept. 30	119	10·5	3·62	11 16	62·5

PEAS—VARIETY TEST

Five varieties of peas, viz. MacKay, Ottawa 25; Chancellor, Ottawa 26; Arthur, Ottawa 18; Canadian Beauty, and Prussian Blue, were sown on May 31 in quadruplicate plots of 1/100 acre each. They became infested with aphids in July and were treated with nicotine sulphate dust at the rate of 45 pounds per acre. This treatment destroyed them but the aphids had made the peas so uneven that they were cut for green feed on August 23. These same varieties of peas were also sown in quadruplicate rod-row plots on June 5. Owing to the cool summer and wet fall only two varieties, viz. Chancellor and Arthur ripened. Chancellor is an early variety and has given a higher yield than any other variety except MacKay during the three years it has been grown at the Station.

ROD-ROW VARIETY TEST OF CEREAL

The variety tests of cereals in rod-row plots begun in 1924 was continued this year. Each variety of wheat, oats and barley was tested in quadruplicate plots. Three plots of each variety consisted of three drills 18½ feet long. The fourth plot, which was used as a seed plot consisted of five drills. The drills in each case were 7 inches apart. At harvest time a foot was taken off the ends of each plot in order to obtain field conditions. The yield was taken from the centre row in the three-row plots, and from the three centre rows in the five-row plots, the outside rows being discarded.

Twenty varieties of wheat, thirty-two varieties of oats, and twenty-one varieties of barley were tested in this manner. Huron was the highest yielding wheat. Gold Rain was the highest yielding oat. Early Chevalier and Charlottetown 80 were the highest yielding barleys. A full report will be given at a later date when more data accumulates.

BUCKWHEAT—VARIETY TEST IN ROD-ROW

Twenty-one varieties or strains of buckwheat were sown in duplicate rod-row plots of three rows each on June 9. Various selections of the Tartarian and Rye yielded better than the Silverhulls. The greater yields of the Tartarian and Rye are due to early ripening. Some of the selections of Tartarian and Rye made at Fredericton are promising.

TEST OF FARMERS' GRAINS

In order to compare the yielding qualities and purity of the oats sown by the average New Brunswick farmer, a number of farmers were invited to send samples of their seed to the Station. This seed was tested in row-row plots of four rows each. At harvest time the yield of only the two centre rows were taken, the other two rows being disregarded. Each sample occupied two of these plots, Victory being used as a check. The grain was sown June 5. The average yields are shown in table 43.

TABLE 43—OATS—TEST OF FARMERS' GRAIN

Name of variety	Source	Number of days maturing	Average length of straw, including heads	Strength of straw on scale of 10 points	Yield of grain per plot	Relative yield
			inches		grams	
*Twentieth Century	J. Clark &Sons, Fredericton 1922 (Govt. inspected).	104·0	36·0	7·5	438·1	100·3
Victory (Check)	Ottawa, 1915	105·5	38·0	9·0	436·9	100·0
Banner	Feed and seed store, No. 1	105·5	35·5	8·0	415·1	95·0
Thought to be Banner	Sheaf gathered in potato field 3 years ago.	104·0	35·5	9·0	401·8	92·0
Victory	Experimental Farm, Ottawa (trial packages).	107·0	35·5	9·0	395·0	90·4
Unknown	Quebec, 3 years ago	104·0	33·0	7·0	394·2	90·2
Unknown	Feed Store No. 2	107·0	36·0	8·0	387·5	88·7
Leader	Wm. Ewing Seed Co., Montreal.	105·5	35·5	8·0	381·7	87·4
Fred Dow	Feed oats, from feed store, originally from Northern Ontario.	104·0	37·5	8·0	379·5	86·9
Unknown	P.E.I., 2 years ago	105·5	34·0	9·0	370·5	84·8
Banner	P.E.I. Seed Growers, 1925	104·0	33·5	9·0	360·1	82·4
Unknown	Feed store, No. 1, Western	104·0	34·5	7·5	353·5	80·9
Banner	Neighbouring farmer, obtained from O.A.C. six years ago.	104·0	32·5	9·0	339·8	77·8
Bumper King	Seed house (unknown)	104·0	34·0	7·0	339·9	77·8
Unknown	Farmers' Feed and Seed Store, Western oats.	104·5	32·5	7·5	335·5	76·8
Potato Oats	Farmer in neighbourhood	103·5	34·5	7·0	330·6	75·7
Gold Mine	Neighbouring farmer	104·0	34·0	8·5	327·7	75·0
Sensation	J. A. Bruce & Co., Ltd., 4 or 5 years ago.	104·0	33·0	7·5	322·5	73·8
Unknown	Govt. inspected seed from feed store which sells seed.	104·0	31·5	6·0	317·4	72·6
Unknown	P.E.I., a few years ago	98·0	34·5	7·0	316·8	72·5
Banner	Co-operatice Society, St. Rosalie, Quebec.	104·0	33·0	8·5	293·1	67·1
Thought to be Banner	Dupuy & Ferguson, 3 years ago.	108·0	34·0	8·5	290·7	66·5

*Although Twentieth Century yielded six pounds per acre more grain, the hull of Victory was lighter; therefore Victory gave 1,579 pounds of kernels per acre, as compared with 1,523 pounds from Twentieth Century.

FORAGE CROPS

The spring was backward, and crops were sown later than usual. A wet open fall, a heavy snowfall and timely rains, kept the soil well supplied with moisture and crops made splendid growth.

FIELD ROOTS

In the fall of 1925 a 15-ton per acre application of barnyard manure was ploughed under. In the spring the land was again ploughed and given a broadcast application of 1,000 pounds 4-8-6 home-mixed fertilizer per acre. The land was then harrowed with the disc and smoothing harrow and ribbed up into 30-inch drills. In taking yields, only those portions of each plot which had a perfect stand were taken.

The roots were weighed green and duplicate five-pound samples of each variety were taken. These samples were sent to Ottawa for dry-matter determination.

SWEDES AND TURNIPS—VARIETY TEST

Twenty-five varieties of swedes and three varieties of turnips were sown in quadruplicate plots on May 28. The area of each plot was 210 square feet. They were thinned to 12 inches on June 23, and were pulled on October 19. The land was in clover the previous year, and although it was limed for the clover crop, there was considerable club root. The yields are shown in table 44.

TABLE 44—SWEDES AND FALL TURNIPS—VARIETY TEST

Name of Variety	Source of Seed	Yield per acre	
		Green weight	Dry weight
		ton lb.	ton lb.
Swedes—			
Improved Yellow Swedish	General Swedish Seed Co., Svalof	29 520	3 616
Mammoth Clyde Purple Top	Wm. Ewing Co	32 527	3 169
Olsgaard Bangholm	Hjalmar, Hartman & Co., Copenhagen.	31 83	3 9
Bangholm-Steelsgaard, 5018	Trifolium	25 1,816	2 1,899
Shepherd	Trifolium	33 141	2 1,853
Bangholm	General Swedish Seed Co., Svalof	31 973	2 1,845
Bangholm (Klark)	Trifolium	28 773	2 1,775
Bangholm Pajbjeeg V	Trifolium	31 1,402	2 1,768
Shepherd Golden Globe	Hjalmar, Hartman & Co., Copenhagen	28 1,074	2 1,613
Ditmars	H. H. McNutt	32 1,720	2 1,191
Bangholm	Wm. Ewing Co	28 1,889	2 1,187
Bangholm	Kentville	24 894	2 1,154
Kangaroo	Wm. Rennie Seed Co	26 737	2 1,086
Bangholm	Charlottetown	22 230	2 1,065
Selected Magnum Bonum	Wm. Rennie Seed Co	28 552	2 1,146
Invicta Bronze Top	Wm. Rennie Seed Co	29 1,190	2 1,033
Bangholm	Nappan	23 1,086	2 1,021
New Century	Wm. Rennie Seed Co	29 643	2 1,003
Magnum Bonum	Wm. Ewing Co	26 1,753	2 969
Universal	Wm. Ewing Co	25 1,927	2 966
Best of All	Wm. Rennie Seed Co	28 205	2 819
Irish King	Wm. Rennie Seed Co	27 1,794	2 754
Garton's Superlative	Wm. Ewing Co	28 1,127	2 565
Kangaroo Bronze Green Top	Wm. Ewing Co	24 678	2 234
Canadian Gem Purple Top	Wm. Rennie Seed Co	23 1,428	1 1,907
Fall Turnips—			
Fynsk Bortfelder	Hjalmar, Hartman & Co., Copenhagen	23 460	1 1,093
Yellow Tankard	Danske Landboforeningers Froforsyning, Roskilde	21 527	1 1,010
Fynsk Bortfelder	Danske Landboforeningers Froforsyning, Roskilde.	23 1,931	1 952

MANGELS—VARIETY TEST

Thirty-one varieties of mangels were sown in quadruplicate plots on May 28. The area of each plot was 210 square feet. They were thinned to 10-inches on June 28 and were pulled on October 9. Two plots of each variety were sown on land which was in clover the previous year, the other two plots were sown on land which was in corn the previous year. The yields are shown in table 45.

TABLE 45.—MANGELS—VARIETY TEST

Name of Variety	Source of Seed	Yield per acre			
		Green weight		Dry weight	
		ton	lb.	ton	lb.
Danish Sludstrup	Wm. Ewing Co	32	332	3	1,636
Ideal	Wm. Rennie Seed Co	40	856	3	1,227
White Green Top Half Sugar	Hjalmar, Hartman & Co., Copenhagen	30	1,492	3	1,210
Elvetham Mammoth	Hjalmar, Hartman & Co., Copenhagen	30	190	3	1,078
Sludstrup Barres	Hjalmar, Hartman & Co., Copenhagen	34	1,871	3	871
Yellow Intermediate	Central Experimental Farm	31	1,290	3	716
Long Red Mammoth	Wm. Ewing Co	31	1,825	3	703
Stryno Barres	Hjalmar, Hartman & Co., Copenhagen	35	1,167	3	688
Taaroje Barres	Hjalmar, Hartman & Co., Copenhagen	34	1,731	3	668
Rosted Barres	Hjalmar, Hartman & Co., Copenhagen	36	665	3	454
Red Top Half Sugar	Wm. Ewing Co	27	899	3	358
Danish Sludstrup	Kenneth McDonald & Sons	34	1,529	3	308
Perfection Mammoth Long Red	Wm. Rennie Seed Co	30	635	3	276
Giant White Half Sugar	Wm. Ewing Co	33	170	3	143
Yellow Eckendorfer	General Swedish Seed Co., Svalof	33	234	3	84
White Red Top Half Sugar	Hjalmar, Hartman & Co., Copenhagen	25	545	2	1,987
Barres Half Long	General Swedish Seed Co., Svalof	32	1,106	2	1,831
Giant Yellow Intermediate	Wm. Ewing Co	29	1,057	2	1,826
Fjerritslev Barres	Hjalmar, Hartman & Co., Copenhagen	31	639	2	1,798
Red Eckendorfer	General Swedish Seed Co., Svalof	33	100	2	1,770
Svalof Original Alfa	General Swedish Seed Co., Svalof	25	1,055	2	1,709
Leviathan	Wm. Rennie Seed Co	30	1,984	2	1,679
Barres Oval	General Swedish Seed Co., Svalof	31	758	2	1,633
Eckendorfer Red	Hjalmar, Hartman & Co., Copenhagen	33	449	2	1,619
Eckendorfer Yellow	Hjalmar, Hartman & Co., Copenhagen	34	640	2	1,611
Svalof Original Rubra	General Swedish Seed Co., Svalof	24	1,033	2	1,462
Improved Giant Sugar	Wm. Rennie Seed Co	27	545	2	1,271
Golden Tankard	Wm. Ewing Co	25	1,224	2	1,046
Golden Tankard	Wm. Rennie Seed Co	24	1,153	2	981
Giant Yellow Globe	Wm. Rennie Seed Co	31	1,378	2	961
Giant Yellow Globe	Wm. Ewing Co	33	227	2	876

CARROTS—VARIETY TEST

Fifteen varieties of carrots were sown in quadruplicate plots on May 28. The area of each plot was 210 square feet. They were thinned to 4 inches on June 6, and were pulled on October 12. The carrots were grown on sandy loam which grew a crop of clover the previous year. The yields are shown in table 46.

TABLE 46—CARROTS—VARIETY TEST

Name of Variety	Source of seed	Yield per acre			
		Green weight		Dry weight	
		ton	lb.	ton	lb.
Mammoth Short White	Wm. Rennie Seed Co	23	215	2	281
Improved Intermediate White	Wm. Ewing Co	23	878	2	133
White Intermediate	Summerland	22	323	2	54
White Belgian	Wm. Ewing Co	20	1,784	1	1,935
White Belgian	Hjalmar, Hartman & Co., Copenhagen	18	1,190	1	1,782
White Belgian, 9008	Trifolium	17	1,270	1	1,735
Champion	General Swedish Seed Co., Svalof	18	1,607	1	1,668
Yellow Belgian	Wm. Ewing Co	19	896	1	1,642
Large White Belgian	Wm. Rennie Seed Co	19	352	1	1,574
Danish Champion	Hjalmar, Hartman & Co., Copenhagen	19	1,380	1	1,476
New Yellow Intermediate	Wm. Ewing Co	19	1,745	1	1,416
White Belgian	Dupuy & Ferguson	21	219	1	1,395
White Half Long	General Swedish Seed Co., Svalof	17	1,951	1	1,375
Danish Champion	C. E. F	16	1,677	1	1,250
James	Danske Landboforeninger, Froforsyning, Roskilde	13	1,727	1	1,181

SUGAR BEETS—VARIETY TEST

Three varieties of sugar beets were sown in quadruplicate plots on May 28. The area of each plot was 210 square feet. They were thinned to 10 inches on May 28, and were pulled on October 7. They were grown on sandy loam which grew a crop of clover the previous year. The yields are shown in table 47.

TABLE 47—SUGAR BEETS—VARIETY TEST

Name of Variety	Source of seed	Yield per acre			
		Green weight		Dry weight	
		tons	lb.	tons	lb.
Dippe	Dominion Sugar Co., Chatham, Ont	18	1,785	3	1,951
Horning	Dominion Sugar Co., Chatham, Ont	18	1,515	3	1,548
Schreiber & Sons	Dominion Sugar Co., Chatham, Ont	17	204	3	1,035

KALE AND RAPE—VARIETY TEST

On May 28 four varieties of kale and eight varieties of rape were sown in quadruplicate plots. They were thinned to 5 inches on June 25. The kales were cut on September 21. The three varieties of summer rape began to bloom in July. They were therefore cut. Two of these varieties did not grow after cutting. The third grew a second time but the growth was so scanty that it had no economic importance. Half of each plot of the remaining varieties of rape were cut on August 19 and again on October 16. The other half of these plots were cut on September 21. The half which was cut once gave approximately the same yield as the half which was cut twice. The yields are shown in table 48.

TABLE 48—KALE AND RAPE—VARIETY TEST

Name of variety	Source of seed	Yield per acre				Remarks
		Green weight		Dry weight		
		ton	lb.	ton	lb.	
Kale—						
Curled Sheep Kale	Suttons, England	24	1,070	2	64	Very uniform plots.
Improved 1,000-headed Kale	Suttons, England	19	1,075	1	1,800	
Marrow Stemmed Kale	Suttons, England	22	588	1	1,787	Very large butts.
1,000-headed Kale	Suttons, England	16	1,840	1	1,531	
Rape—						
Dwarf Essex Rape	Gartons, England	32	1,457	3	127	
Large Seeded Winter Umbrella	Vilmorin Andrieux & Co	30	580	2	1,381	
Large Seeded Winter (Common Essex)	Andrieux & Co	28	932	2	957	
Giant Rape		21	1,836	2	283	
Small Seeded Turnip Rape, Winter or German Winter Rape	Andrieux & Co	20	992	1	786	A number of white turnips were found in this variety.
Large Seeded Colza, Summer	Andrieux & Co	8	245	—	1,428	Started to bloom July 30 and was cut. No second crop.
Large Seeded Koubja Russian Summer Rape	Andrieux & Co	6	220	—	1,070	Beginning to bloom when cut Aug. 1. Very little second crop.
Small Seeded Turnip Rape, Summer or German Summer Rape	Andrieux & Co	2	456	—	576	Had nearly all gone to seed when cut July 26.

ENSILAGE CROPS

The land on which the variety tests of corn and sunflowers were conducted was a clay loam which grew a crop of turnips the previous year. For the turnips the land was manured at the rate of 15 tons barnyard manure and 800 pounds 4-8-6 home-mixed fertilizer per acre. This spring 15 tons of manure was ploughed under. The land was then given a broadcast application of 1,600 pounds 4-8-6 home-mixed fertilizer per acre. This fertilizer was worked into the land with the disc and smoothing harrow.

The corn and sunflowers were planted in hills three feet apart each way and thinned to three plants per hill. The area of each plot was 324 square feet when the outside hills were removed. In harvesting, all hills with misses were discarded.

When harvesting a 5-pound composite sample from each plot was sent to Ottawa for dry matter determination.

CORN—VARIETY TEST

Twenty-three varieties of corn were tested in quadruplicate plots and one variety, viz., Hybrid (Wisconsin No. 7 X Howes Alberta Flint), was tested in a single plot. The corn was sown on June 1 and harvested on September 27. Owing to the cool summer the corn made very poor growth and was very immature when cut. The results are shown in table 49.

TABLE 49—CORN—VARIETY TEST

Name of variety	Source of seed	Degree of maturity	Yield per acre			
			Green weight		Dry weight	
			tons	lb.	tons	lb.
Longfellow	J. O. Duke Seed Co.	Kernels not formed	11	1,749	1	556
Hybrid	Twitchells Pride x Wisconsin No. 7	Kernels beginning to form	10	1,866	1	540
Hybrid	Howes Alberta Flint x Wisconsin No. 7	Late milk—early dough	8	1,617	1	408
Compton's Early	J. O. Duke Seed Co.	Kernels beginning to form on few plants	11	1,025	1	379
Longfellow	Dakota Improved Seed Co.	Kernels not formed	10	1,005	1	179
Northwestern Dent	Kenneth McDonald & Son	Kernels beginning to form on few plants	8	1,261	1	52
Northwestern Dent	Dakota Improved Seed Co.	Kernels beginning to form	9	387	—	1,961
North Dakota	Steele-Briggs	Kernels not formed	7	1,988	—	1,935
Burr Leaming	G. S. Carter	Beginning to tassel	9	988	—	1,875
Wisconsin No. 7	J. O. Duke Seed Co.	Not tasseled	9	143	—	1,871
Twitchell's Pride	Fredericton, originally from G. M. Twitchell	Late milk	7	1,047	—	1,851
Hybrid	A. J. Wimple	Kernels not formed	8	1,081	—	1,796
Golden Glow	J. O. Duke Seed Co.	Kernels not formed	7	1,262	—	1,791
Northwestern Dent, Nebraska Grown	A. E. McKenzie	Ears not formed	7	906	—	1,671
Leaming	J. O. Duke Seed Co.	Not tasseled	9	270	—	1,642
Northwestern Red or Smoky Dent	Wm. Rennie Seed Co.	Kernels not formed	7	65	—	1,629
Disco 90 Day White Dent	Dakota Improved Seed Co.	Kernels not formed	7	1,115	—	1,618
Yellow Dent	A. J. Wimple	Kernels not formed	7	413	—	1,618
Northwestern Dent	O. Will	Late milk	6	819	—	1,609
Disco Pride Yellow Dent	Dakota Improved Seed Co.	Kernels not formed	6	437	—	1,498
Northwestern Dent, North Dakota Grown	A. E. McKenzie	Late milk	6	751	—	1,456
Northwestern Dent	Brandon	Late milk	6	138	—	1,378
White Capped Yellow Dent	Steele-Briggs	Ears not formed	6	436	—	1,373
Amber Flint	A. J. Wimple	Kernels beginning to form	4	836	—	938

SUNFLOWERS—VARIETY TEST

Five varieties of sunflowers were sown in quadruplicate plots on June 1. Each variety was harvested when approximately fifty per cent in bloom. The results are shown in table 50.

TABLE 50—SUNFLOWERS—VARIETY TEST

Name of variety	Source of seed	Date cut	Yield per acre			
			Green weight		Dry weight	
			tons	lb.	tons	lb.
Mammoth Russian	Kenneth McDonald & Sons	Sept. 25	22	690	2	1,084
Giant Russian	Dakota Improved Seed Co.	" 8	12	1,340	1	841
Manchurian	A. E. McKenzie	" 3	10	772	1	471
Ottawa No. 76	Ottawa	" 3	10	166	1	63
Mennonite	Rosthern	Aug. 17	4	1,843	—	752

CORN-BREEDING

Corn-breeding work is being carried on with a Flint corn called Twitchell's Pride, which was received from G. M. Twitchell, Noniwick, Maine, eight years ago. This corn has now been grown for eight seasons and in all but one year it has reached a fair state of maturity. It, however, is not quite early enough to recommend for general culture as a grain corn.

In-breeding work has been carried on with this corn for three years and the undesirable types are being eliminated. A number of strains in the third generation are quite uniform in type and are promising. Intercrosses will be made between a number of these strains next season.

Efforts are also being made to maintain or increase the yielding ability of this variety by comparing the crop produced from different ears, and breeding the best of these.

A portion of the seed on the ear is used for this work. From the results of these ear-to-the-row experiments the most desirable strain is selected to be used as a male or pollen producing strain for breeding work which is done the following year. Other strains which are above the average are also selected for breeding work the following year and are used as female plants. This breeding work is carried on by using the seed from the ear remnants to propagate the strain. The most desirable strain is planted in every third or fourth row in the corn plantation. The other strains are planted separately in the intervening rows. The tassels are removed from all but the most desirable strain so that all the seed produced will be the progeny of the one superior male.

Experiments are also being carried on crossing Twitchell's Pride corn with Wisconsin No. 7 corn. The Twitchell's Pride corn is not a heavy enough producer of forage for ensilage purposes. The Wisconsin No. 7, which is a Dent corn, is a heavy producer of forage but does not reach sufficient maturity for satisfactory ensilage. This work is being carried on at the corn-breeding Station at Harrow and the results for two years indicate that the hybrid may be of considerable value for ensilage purposes in this province.

EXPERIMENTS IN GROWING ALFALFA

Tests of the effect of nurse-crops, rates and methods of seeding, lime, and wood ashes, on alfalfa were continued this year. Most of the alfalfa plots sown June 26, 1922, came through the winter in good condition. (These plots were sown on clean land which was in corn the previous year). They were not cut the first season, but each year since that date, viz. 1923, 1924, 1925 and 1926 they have been cut twice.

Results at the Station indicate that alfalfa can be grown successfully in this district. In order to obtain a strong, vigorous, persistent growth, however, the land must be free from weeds, and the seed-bed carefully prepared before seeding. The land should also receive an application of either wood ashes or lime. The yields from the 1922 seeding are shown in table 51.

TABLE 51—EXPERIMENTS IN GROWING ALFALFA

Plot No.	Method of seeding	With or without nurse crop	Limed or unlimed	Rate of seeding	Green weight per acre, 1926	*Hay per acre, 1926	Average hay per acre, 1923–26 inclusive
				lb.	tons lb.	tons lb.	tons lb.
1	Broadcast	Without	Limed	20	13 923	3 1,525	3 1,274
2	12-inch rows	"	"	10	14 1,591	3 1,678	3 1,020
3	24-inch rows	"	"	5	13 934	3 1,132	3 157
4	Broadcast	With	"	20	9 428	3 154	2 875
5	12-inch rows	"	"	10	9 873	2 1,749	2 1,170
6	24-inch rows	"	"	5	12 324	3 1,341	3 72
7	Broadcast	Without	Unlimed	20	11 661	3 512	3 797
8	12-inch rows	"	"	10	13 222	3 1,429	3 414
9	24-inch rows	"	"	5	10 581	3 438	2 1,194
10	Broadcast	With	"	20	8 471	2 1,352	2 603
11	12-inch rows	"	"	10	10 43	3 39	2 914
12	24-inch rows	"	"	5	1 1,027	3 504	2 1,382
13	Broadcast	Without	Wood ashes	20	15 1,385	4 356	3 1,383
14	12-inch rows	"	"	10	17 1,575	4 898	3 1,788
15	24-inch rows	"	"	5	14 873	3 1,588	3 975

*Hay yield was obtained by drying a green sample to absolute dry weight and then bringing it to hay containing 15 per cent moisture.

TEST OF RED CLOVER SEED FROM DIFFERENT SOURCES

In order to further test the adaptability of clover seed from different Canadian and European sources, eleven triplicate and three duplicate plots, 1/100 acre each were sown on June 10, 1925. All clover plots went into the winter in good condition. The land was evenly covered with snow from December 22 until April 25. Notwithstanding this protection, over fifty per cent of the clover from Italian sources winter-killed. The clover from Canadian and Northern European sources came through the winter with very little winter-killing. The clovers from Canadian sources gave the largest yields. The clovers from Northern European sources gave good yields, while the clovers from Italian sources were almost a total failure.

Space will not permit publication of yields but a summary will be published next year when the experiment is completed.

The tests of clovers carried on the past three years, however, indicate (1) that Italian clover cannot withstand the average New Brunswick winter, (2) that clover from Canadian and Swedish sources are hardy and adapted to New Brunswick conditions.

SWEET CLOVER—VARIETY TEST

Seven varieties of sweet clover were sown in 1/100 acre plots on June 9, 1925. Two plots of each variety were sown with a nurse-crop of barley, and one plot of each variety was sown without a nurse-crop. The rate of seeding was 30 pounds per acre. The seed failed to catch on all the plots, therefore they were ploughed up in the fall.

The results with sweet clover to date seem to show it has very little value as a hay or pasture crop in this district. The yields are low and it is difficult to get a good stand.

PASTURE CLOVERS

On June 9, 1925, duplicate plots 1/100 acre each were sown with Ladino, Danish Stryno and Danish Morso, White or Dutch clover, at the rate of 6 pounds per acre. These plots were all sown with a nurse-crop of barley. Good stands were secured on all plots, and the clovers came through the winter with practically no winter-killing. Ladino was cut three times, the other clovers were cut twice. Ladino yielded 15 tons, 1,250 pounds green weight per acre. The hay yield was 2 tons, 1,569 pounds. Danish Stryno yielded 9 tons 1,000 pounds green weight per acre. The hay yield was 1 ton, 1,638 pounds. Danish Morso yielded 8 tons, 1,300 pounds per acre. The hay yield was 1 ton, 1,256 pounds. Ladino is about twice as large as the average white, and appears to have possibilities as a hay crop.

EXPERIMENTS WITH FERTILIZERS

The work carried on during the year in co-operation with the Division of Chemistry included a fertilizer formulæ experiment with a three-year rotation of potatoes, grain and hay; an experiment to determine the value of basic slag, rock phosphate and superphosphate as a source of phosphoric acid; pasture fertilizer experiments with basic slag, superphosphate, lime and nitrate of soda; an experiment with fertilizer formulae for a growing orchard; an experiment with lime; an experiment with nitrate of soda on hay lands, and an experiment to determine the value of Cyanamide, Urea and Ammo Phos as sources of nitrogen for a potato, grain and hay rotation.

FERTILIZER FORMULÆ EXPERIMENT WITH A THREE-YEAR ROTATION

The experiment in which ten different fertilizer formulæ were applied at three different rates was continued this spring. The object of this experiment is to ascertain which fertilizer formulæ and rate of application would give the best results, under New Brunswick conditions, in a three-year rotation of potatoes, grain and hay.

The land devoted to this experiment is a clay loam with a clay subsoil. This year the same treatment was given each plot as in 1922 when an experiment, of which the present one is a duplication, was conducted on this field. In 1921 ten tons of manure per acre was applied and a crop of potatoes was grown on the field. No manure has been applied since that date. Thirty duplicate plots and eight checks, 1/20 acre each, were used. A one-year-old clover sod was ploughed under on May 24. The potatoes were planted on May 28 and 29 and they were dug on October 18 and 19.

The tabulated data shows that when no manure is applied to land of this type an application of 2,000 pounds per acre of fertilizer will give a profitable increase of crop over 1,000 or 1,500 pounds. The smaller application, however, will give a larger increase per pound of fertilizer applied. The results are shown in table 52. (Project C 8.)

TABLE 52—FERTILIZER FORMULÆ EXPERIMENT. THREE-YEAR ROTATION—1ST YEAR POTATOES, 2ND YEAR GRAIN, 3RD YEAR HAY. SECOND SERIES OF ROTATION—RETURNS FROM POTATO CROP, 1926

Plot No.	Formulae of fertilizer	Rate of application	Cost of fertilizer per acre	Yield per acre		Increase over adjoining checks	Cost of increase per cwt. over adjoining checks	Average cost of increase per cwt. at various rates
				Marketable	Small			
		lb.	$	lb.	lb.	lb.	$	$
1	6–6– 6	2,000	35·10	16,230	900	9,480	·370	
2	5–6– 6	2,000	31·32	15·330	840	6,210	·504	
3	4–6– 6	2,000	27·55	15,450	1,050	6,330	·435	
4	3–6– 6	2,000	23·77	17,370	1,230	8,250	·288	
5	5–8– 6	2,000	33·95	18,480	990	9,360	·363	
6	4–8– 6	2,000	30·18	18,540	1,230	9,420	·320	
7	3–8– 6	2,000	26·40	16,380	1,440	7,260	·364	
8	4–8–10	2,000	33·22	18,0?0	960	7,6?0	·436	
9	4–8– 8	2,000	31·70	17,580	1,110	7,170	·442	
10	4–8– 4	2,000	28·66	14,970	1,350	4,560	·629	·3990
11	6–6– 6	1,500	26·33	16,800	1,590	6,390	·412	
12	5–6– 6	1,500	23·48	17,310	1,440	6,900	·340	
13	4–6– 6	1,500	20·66	15,600	1,080	5,190	·398	
14	3–6– 6	1,500	17·83	16,320	960	5,910	·302	
15	5–8– 6	1,500	25·46	17,130	1,320	6,900	·369	
16	4–8– 6	1,500	22·63	17,910	1,230	7,080	·295	
17	3–8– 6	1,500	19·79	16,650	960	6,420	·308	
18	4–8–10	1,500	24·91	17,910	960	6,540	·381	
19	4–8– 8	1,500	23·77	17,910	1,170	6,540	·363	
20	4–8– 4	1,500	21·49	17,430	1,350	6,060	·355	·3506
21	6–6– 6	1,000	17·55	15,?30	1,170	5,500	·320	
22	5–6– 6	1,000	15·66	16,890	1,020	6,?20	·233	
23	4–6– 6	1,000	13·78	13,140	1,140	2,970	·464	
24	3–6– 6	1,000	11·89	13,740	1,350	3,570	·333	
25	5–8– 6	1,000	16·98	14,730	930	5,730	·296	
26	4–8– 6	1,000	15·09	13,230	870	4,230	·357	
27	3–8– 6	1,000	13·20	14,700	1,110	5,700	·232	
28	4–8–10	1,000	16·61	14,550	930	5,550	·299	
29	4–8– 8	1,000	15·84	15,630	930	6,630	·239	
30	4–8– 4	1,000	14·32	15,780	1,260	6,780	·211	·2827

EFFECT OF LIME ON A POTATO CROP

In 1916, 5,000 pounds per acre of burnt waste lime was applied to one-half of each plot in the fertilizer formulæ experiment. The potatoes on this half of the plot this year were so badly affected with scab that they had to be sold as

culls for 50 cents per barrel of 165 pounds. The potatoes on the unlimed half of each plot were free from scab and were sold for $2.75 per barrel. This would seem to indicate that burnt lime applied at this rate is unsafe for potatoes.

EXPERIMENT TO COMPARE THE VALUE OF DIFFERENT SOURCES OF PHOSPHORIC ACID WHEN USED ALONE AND WITH NITROGEN AND POTASH

The object of this experiment was to test the relative value of fortified slag, Bessemer slag, Florida rock phosphate, Ephos rock phosphate and superphosphate as sources of phosphoric acid when used alone and with nitrogen and potash.

The land used in this experiment is a clay loam with a dense clay subsoil. It was blueberry land until it was broken and underdrained in 1915. In the past five years the crops have been, turnips, 1921; potatoes, 1922; oats, 1923; hay, 1924, and 1925. During the same period it has been fertilized with 15 tons barnyard manure per acre in 1921; 1,000 pounds 3-8-4 home-mixed fertilizer in 1922; and 5 tons of manure per acre as a top-dressing in the fall of 1924.

The land was both fall- and spring-ploughed and worked into a good tilth with the stiff-tooth cultivator, the disk, and smoothing harrow. The late spring and the heavy nature of the soil made early seeding impossible. The various mixtures of fertilizer were applied on June 16, and the grain was sown on June 21. Each mixture was applied to quadruplicate plots of 1/320 acre each at a rate which gave the same amount of phosphoric acid in each mixture.

The superphosphate plots gave a small increase over the checks, but the slag did not give any increase. This was probably due to the late date of application. A fuller report of this experiment will be given when the hay yields are available. (Projects C 26 and 138.)

PASTURE FERTILIZER EXPERIMENT

In order to study the effect of different fertilizers on pastures, eighteen plots $\frac{1}{100}$ acre each were given an application of fertilizer on May 11, 1923. In 1923 and 1924 the grass was cut four times with a lawn mower. In 1925 the grass was cut three times with a scythe as it was felt that a lawn mower cut it closer than it would be kept if grazed. On May 22, 1926, the plots were given another application of fertilizer. Cattle broke into the field on June 5 and spoiled a number of plots, so they were all cut and the yields disregarded. The plots were again cut with a scythe on July 1, July 28, and September 1. The fertilizer used, rate of application and yields, are shown in table 53. (Project C 98.)

TABLE 53—PASTURE FERTILIZER EXPERIMENT. YIELD OF GRASS (GREEN) 1926 AND AVERAGE YIELD FOR 1923-25

Treatment given in 1923 and in 1926		Number of plots	Yield per acre		Average increase in last 4 years over checks
Fertilizer used	Rate of application per acre		Green weight 1926	Average green weight 1923-26	
	lb.		ton lb.	ton lb.	ton lb.
Basic slag	1,000	2	2 981	2 1,334	— 1,970
Ground limestone	2,000	1	2 375	2 1,036	— 1,672
Superphosphate	438	2	2 1,259	2 995	— 1,631
Superphosphate + Ground limestone	438 + 2,000	1	2 1,550	2 970	— 1,606
Basic slag	750	2	2 569	2 877	— 1,513
Ground limestone	4,000	1	1 1,900	2 811	— 1,447
Superphosphate + Ground limestone	438 + 1,000	1	2 306	2 625	— 1,261
Nitrate of soda	200	2	2 953	2 191	— 827
Basic slag	500	2	1 1,781	2 131	— 767
Nitrate of soda	100	2	2 600	2 13	— 649
Basic slag	250	2	1 1,694	1 1,858	— 494
Checks		2	1 1,225	1 1,364	

STOCK-CARRYING PROPERTIES OF NEW BRUNSWICK PASTURES—SLAGGED VERSUS UNTREATED

An experiment comparing the gains which sheep will make on slagged and unslagged pasture has been conducted the last four years. On May 14, 1923, a one and one-half acre plot was given an application of 750 pounds Bessemer slag (16 per cent P_2O_5) per acre. An adjoining plot of the same area was unfertilized. In 1923 sheep were pastured on these plots from May 30 to August 14 inclusive. In 1924 the area of each plot was reduced to one acre and they were used as sheep pasture from May 30 to August 19, inclusive. In 1923 the sheep on the slagged area made slightly larger gain, and in 1924 both lots of sheep made practically the same gain. In 1925 the grass on both plots was cut for hay. The slagged acre yielded 2,500 pounds hay, and the unslagged acre yielded 2,450 pounds. This year each plot was pastured with three ewes and five lambs. The sheep on the slagged acre gained 196½ pounds, and those on the unslagged acre gained 157½ pounds.

This experiment will be continued. (Project C 96.)

ORCHARD FERTILIZER EXPERIMENT

The young orchard set out in 1923 to determine which fertilizer formulae and rate of application would best promote growth received another application of fertilizer. A cover crop of buckwheat was sown on July 22. The orchard is making good growth. A full report of this experiment will be given at a later date. (Project C 99.)

NITRATE OF SODA ON HAY LANDS

An experiment was begun in 1925 to determine which rates and dates of applying nitrate of soda broadcast to the hay crop would give the best result. In 1925 the application of 50 pounds per acre at the commencement of growth followed by an additional 50-pound application two or three weeks later gave the cheapest increased yields. An application of 300 pounds per acre at the commencement of growth gave the largest increase over the checks, but the cost per ton of the increase was much higher than for the lighter applications. (Project C 25.)

AMMO-PHOS FOR THE POTATO CROP

In order to determine the value of Ammo-Phos as a source of nitrogen and phosphoric acid, an experiment was begun in 1926 in a three-year rotation of potatoes, oats, and hay, but was designed primarily to determine the value of this material for the potato crop.

The equivalent of a 4-8-6 fertilizer mixture was prepared using Ammo-Phos as a source of nitrogen and phosphoric acid in comparison with a mixture of nitrate of soda, sulphate of ammonia, and superphosphate. Muriate of potash was used as a source of potash. Applications were made at the rate of 1,000 and 2,000 pounds per acre. The soil was a clay loam which was in hay the previous year. The fertilizer was applied in the row and covered lightly with earth.

Experiments were carried on in quadruplicate in $\frac{1}{320}$ acre plots. Potatoes were planted June 21.

The results for the potato crop in 1926 were as shown in table 54. (Project C 159.)

TABLE 54—AMMO-PHOS FOR THE POTATO CROP

Fertilizer used per acre	4-8-6 equivalent per acre	Per cent stand	Yield per acre		
			Merchantable	Small	Total
	lb.		lb.	lb.	lb.
Nitrate of soda, 133 lb. Sulphate of ammonia, 100 lb. Superphosphate, 500 lb. Muriate of potash, 120 lb.	1,000	100	19,680	2,560	22,240
Ammo-Phos (20-40 grade) 186 lb. Ammo-Phos (13-48 grade) 90 lb. Muriate of potash, 120 lb.	1,000	97·9	19,920	2,240	22,160
Checks	. . . . .	100	12,640	2,020	14,660
Nitrate of soda, 266 lb. Sulphate of ammonia, 200 lb. Superphosphate, 1,000 lb. Muriate of potash, 240 lb.	2,000	95·8	23,200	1,520	24,720
Ammo-Phos (20-40 grade) 370 lb. Ammo-Phos (13-48 grade) 180 lb. Muriate of potash, 240 lb.	2,000	97·9	21,360	1,920	23,280
Checks	.....	100·0	12,640	2,020	14,660

The tabulated data show that Ammo-Phos can be safely used for the potato crop. Where applications of 1,000 pounds of 4-8-6 fertilizer per acre were made Ammo-Phos gave practically the same results as nitrate of soda, sulphate of ammonia and superphosphate. Where 2,000 pounds per acre of a 4-8-6 mixture was used nitrate of soda, sulphate of ammonia and superphosphate gave better results than Ammo-Phos.

SOURCES OF NITROGEN FOR THE POTATO CROP

In order to determine the value of Cyanamide and Urea as sources of nitrogen in a mixed fertilizer for potatoes, an experiment was begun in 1926 in a three-year rotation of potaoes, oats and hay, but was designed primarily to determine the value of these materials for the potato crop.

The equivalent of a 4-8-6 fertilizer mixture was prepared using cyanamide, urea and a mixture of nitrate of soda and sulphate of ammonia as sources of nitrogen. Superphosphate was used as the source of phosphoric acid excepting where basic slag was used with cyanamide in one series. Potash was furnished by muriate of potash. The fertilizer mixture was applied at two rates, viz., 1,000 and 2,000 pounds per acre.

Cyanamide cannot safely be mixed in large quantities with superphosphate, hence when used with this material the former was applied, broadcast separately a week before planting. In order to determine the effect of mixing cyanamide with superphosphate one plot was given an application of 4-8-6 prepared with these materials and muriate of potash. The results of mixing indicated a quick rise of temperature and also a loss of ammonia. When cyanamide and basic slag were used these materials were mixed together and applied at time of planting.

Experiments were carried out in quadruplicate in 1/320 acre plots. Potatoes were planted on June 21. Fertilizers were applied in the row, except in the case of the Cyanamide as previously mentioned, and covered with earth.

The fertilizers applied with the results for the potato crop in 1926 were as shown in table 55. (Project C 161.)

TABLE 55—SOURCES OF NITROGEN FOR THE POTATO CROP

Fertilizer used per acre	4-8-6 equivalent per acre	Per cent stand	Yield per acre		
			Merchantable	Small	Total
	lb.		lb.	lb.	lb.
Nitrate of soda, 133 lb. Sulphate of ammonia, 100 lb. Superphosphate, 500 lb. Muriate of potash, 120 lb.	1,000	100	19,680	2,560	22,240
Cyanamide, 190 lb. (Sown a week before planting Superphosphate, 500 lb. Muriate of potash, 120 lb.	1,000	97·9	18,800	1,920	20,720
Cyanamide, 190 lb. (Mixed with superphosphate and muriate of potash Superphosphate, 500 lb. Muriate of potash, 120 lb.	1,000	97,9	17,760	2,000	19,760
Cyanamide, 190 lb. Basic slag, 500 lb. Muriate of potash, 120 lb.	1,000	98·9	16,320	2,280	18,600
Urea, 87 lb. Superphosphate, 500 lb. Muriate of potash, 120 lb.	1,000	99·4	17,760	2,720	20,480
Checks		100	12,640	2,020	14,660
Nitrate of soda, 266 lb. Sulphate of ammonia, 200 lb. Superphosphate, 1,000 lb. Muriate of potash, 240 lb.	2,000	95·8	23,200	1,520	24,720
Cyanamide, 380 lb. (Sown a week before planting) Superphosphate, 1,000 lb. Muriate of potash, 240 lb.	2,000	98·9	20,400	2,080	22,480
Cyanamide, 380 lb. (Mixed with superphosphate and muriate of potash Superphosphate, 1,000 lb. Muriate of potash, 240	2,000	96·8	19,200	2,400	21,600
Cyanamide, 380 lb. Basic slag, 1,000 lb. Muriate of potash	2,000	97·9	18,440	2,160	20,600
Urea, 174 lb. Superphosphate, 1,000 lb. Muriate of potash, 240 lb.	2,000	99·4	22,440	2,080	24,520
Checks		100	12,640	2,020	14,660

At the smaller rate of application the results this year have shown that a mixture of nitrate of soda and sulphate of ammonia proved to be superior to Cyanamide and Urea as a source of nitrogen for the potato crop. At the larger rate of application, practically the same results were obtained from a mixture of nitrate of soda and sulphate of ammonia, as from Urea, and both of these sources of nitrogen proved distinctly superior to Cyanamide. With respect to the time of application of the Cyanamide it will be noted that when this material was applied separately a week before planting time, better results were obtained than when it was applied in the mixture at planting time.

POULTRY

The work in the poultry plant for the year included pedigree breeding, feeding experiments, hatching experiments, caponizing experiments, and conducting the sixth New Brunswick Egg-Laying Contest.

The stock on hand December 31, 1926 consisted of:—

Barred Rocks: 16 males, 454 hens and 87 chickens.

Toulouse Geese: 4 ganders, 3 geese.

Pekin Ducks: 3 drakes, 13 ducks.

HATCHING RESULTS

The hatching results for the season were as follows:—

HATCHING RESULTS

Total eggs set	6,580.0
Number fertile	5,544.0
Per cent fertile	84.2
Number of chicks	1,686.0
Per cent total eggs hatched	25.6
Per cent fertile eggs hatched	30.4
Number of chicks alive when wing banded	1,028.0
Per cent chicks hatched alive when wing banded	60.9
Total eggs required for one chick hatched	3.9
Total fertile eggs for one chick hatched	3.2
Total eggs required for one chick when wing banded	6.4

(Project P1)

BEST DATE FOR INCUBATION

The hatching results from eggs set at different dates in a Buckeye machine are shown in table 56.

(Project P 3) TABLE 56—HATCHING RESULTS FROM SETTINGS OF DIFFERENT DATES

—	Setting March 20	Setting March 25	Setting March 30	Setting April 7	Setting April 13	Setting April 19	Setting April 26	Setting May 5	Setting May 12
Total eggs set	962	636	726	847	821	606	806	589	587
Number fertile	763	527	606	724	685	509	676	529	525
Per cent fertile	79·3	82·8	83·4	85·4	83·4	83·9	83·8	89·8	89·4
Number of chicks	224	160	189	225	120	88	220	246	214
Per cent total eggs hatched	23·2	25·1	26·0	26·5	14·6	14·5	27·2	41·7	36·4
Per cent fertile eggs hatched	29·3	30·3	31·1	31·0	17·5	17·2	32·5	46·5	40·7
Number of chicks alive when wing-banded	79	94	112	159	74	44	165	148	163
Per cent chicks hatched alive when wing banded	35·2	58·7	59·2	70·6	61·6	50	75	60·1	71·4
Total eggs required for one chick hatched	4·2	3·9	3·8	3·7	6·8	6·8	3·6	2·4	2·7
Total fertile eggs for one chick hatched	3·4	3·2	3·2	3·2	5·7	5·7	3·0	2·1	2·4
Total eggs required for one chick when wing banded	12·1	6·7	6·4	5·3	11·0	13·7	4·8	3·9	3·8

NOTES.—Greatest percentage of fertility was obtained during April and May—the latter month being outstanding in this respect. Hatchability, as shown by the percentage of fertile eggs hatched, was best from May and March settings. April and May settings gave the best results in viability of chicks, shown by the percentage of chicks hatched that were alive at time of wing-banding (three weeks of age).

HATCHING RESULTS FROM HENS AND PULLETS

The hatching results from hens and pullets were as shown in table 57. (Project P 111*a*.)

(Project P 111 (a)) TABLE 57—HATCHING RESULTS FROM HENS AND PULLETS

—	Hens	Pullets
Total eggs set	2,943	3,637
Number fertile	2,560	2,984
Per cent fertile	86·9	82·0
Number of chicks	941	745
Per cent total eggs hatched	31·9	20·4
Per cent fertile eggs hatched	36·7	24·9
Number of chicks alive when wing banded	639	389
Per cent chicks hatched alive when wing banded	67·9	52·2
Total eggs required for one chick hatched	3·1	4·8
Total fertile eggs for one chick hatched	2·7	4·0
Total eggs required for one chick when wing banded	4·6	9·3

NOTES.—The results obtained, as shown by the table, were favourable to the using of mature hens only as breeding stock, with regard to fertility, hatchability and viability of chicks.

SKIM-MILK VERSUS BEEF SCRAP VERSUS FISH MEAL

In order to determine the relative value of different protein feeds for laying hens, experiments were carried on from December 1 to May 31 with skim-milk, beef scrap and fish meal as animal feeds.

Three pens were fed a scratch grain consisting of two parts cracked corn, two parts wheat, and one part oats. Pen 1 was fed a dry mash of equal parts corn meal, wheat bran, wheat middlings, crushed oats, with 10 per cent of beef scrap. Pen 2 was fed a mash the same as Pen 1 excepting that the beef scrap was omitted and skim-milk was fed at the rate of one quart daily for six days of the week. Pen 3 was fed a mash the same as pen 1 excepting that 10 per cent of fish meal was included instead of beef scrap.

There were fifteen pullets in each pen in this experiment at the beginning. Birds that died were not substituted. Three birds were taken out of pen 1, four out of pen 2, and four out of pen 3 on March 1 for breeding purposes. The results are shown in table 58.

TABLE 58.—BEEF SCRAP VERSUS SKIM-MILK VERSUS FISH MEAL FOR EGG PRODUCTION

—		Beef Scrap	Skim-Milk	Fish Meal
Number of days in experiment		182	182	182
Number of birds in experiment at beginning		15	15	15
Scratch feed eaten per bird	lb.	29·25	28·87	29·43
Mash eaten per bird	"	19·75	19·80	21·31
Beef scrap eaten per bird	"	2·46	.....	.....
Skim-milk fed per bird	"	.....	32·54	.....
Fish meal eaten per bird	"	.....	.....	2·65
Grit eaten per bird	"	1·00	1·15	1·15
Shell eaten per bird	"	2·84	2·66	2·56
Green feed eaten per bird	"	22·29	21·66	21·95
Average gain per bird	"	.....	.....	·5
Average loss per bird	"	·5	·1	.....
Number of birds died		3	2	1
Average egg production per bird		90·55	84·58	85·76
Statement of Costs				
Scratch feed at $2.28 per cwt.	$	·667	·658	·671
Mash at $1.92 per cwt.	$	·379	·380	·409
Beef scrap at $3.60 per cwt.	$	·088	.....	.....
Skim-milk at 20c. per cwt.	$	.....	·065	.....
Fish meal at $2.00 per cwt.	$	.....	.....	·053
Grit at 80c. per cwt.	$	·088	·009	·009
Shell at $1.33 per cwt.	$	·037	·035	·034
Green feed at 30c. per cwt.	$	·066	·065	·066
Total cost of feed per bird	$	1·245	1·212	1·242
Cost of eggs per dozen	$	·164	·171	·173
Average value of eggs per bird	$	3·496	3·081	3·098
Gain per bird over cost of feed	$	2·251	1·869	1·856

(Projects P 87, P 82)

AVERAGE EGG PRODUCTION PER BIRD PER MONTH AND MONTHLY PRICES

—	Beef Scrap	Skim-Milk	Fish Meal	Eggs per dozen
	eggs	eggs	eggs	cents
December	17	9·86	7·53	65
January	15·33	13·46	13·78	55
February	11·92	12·46	15·35	45
March	16·6	13·81	14·7	45
April	14·7	17·2	17·3	35
May	15·0	17·77	17·1	30

The hatching results from the pens fed with different animal feeds are shown in table 59. These results were obtained from the regular matings in which male birds were not alternated.

This is the fourth season that beef scrap has been compared with skim-milk for egg production. In two seasons beef scrap gave better results than skim-milk. In two seasons skim-milk was better than beef scrap. In the aggregate skim-milk has a little advantage from the standpoint of egg production, and a larger advantage from the standpoint of profit. This is the first season that fish meal has been tried. From the results it would appear to be a satisfactory animal feed. From the standpoint of the hatchability of the eggs, skim-milk is apparently superior to either beef scrap or fish meal.

TABLE 59—HATCHING RESULTS FROM HENS FED SKIM-MILK VERSUS BEEF SCRAP VERSUS FISH MEAL

—	Beef Scrap	Skim-Milk	Fish Meal
Total eggs set	119	169	91
Number fertile	77	145	60
Per cent fertile	64·7	85·79	65·93
Number of chicks	17	41	2
Per cent total eggs hatched	14·28	24·26	2·19
Per cent fertile eggs hatched	22·07	28·27	3·33

STANDARD (HOME-MIXED) RATION CONTAINING CORN VERSUS RATION MADE FROM HOME-GROWN GRAINS WITHOUT CORN VERSUS RATION CONTAINING HOME-GROWN GRAINS FED SINGLY

In order to determine the value of the grains commonly grown in New Brunswick for poultry-feeding, and also to determine the value of feeding a scratch grain mixture and a mash in hoppers in comparison with the method frequently practised by small flock owners of feeding a ration consisting largely of grains fed singly, the experiment outlined below was begun during the year.

Pen 4 was fed a basal ration of scratch grains consisting of two parts cracked corn, two parts wheat, and one part oats, and a mash (fed in hoppers) consisting of one part wheat bran, one part wheat middlings, one part corn meal and one part crushed oats, with one-half part beef scrap. Grit, oyster shell, green feed, skim-milk and water were also supplied.

Pen 5 was fed a ration of scratch grain consisting of two parts wheat, one part buckwheat and one part oats, and a mash fed in hoppers consisting of one part wheat bran, one part wheat middlings, one part crushed oats and one part buckwheat meal. Grit, oyster shell, green feed, skim-milk and water were also supplied.

Pen 6 was fed on whole oats, buckwheat and wheat, fed singly. A moist mash of crushed oats was fed at midday. This group received skim-milk occasionally. Grit, oyster shell, green feed and water were also supplied.

This experiment ran from December 1, 1925 to May 31, 1926. There were fifteen pullets in each pen until March 1, on that date four birds were taken from each pen for breeding purposes. One bird died in pen 5 on May 5.

The results are shown in table 60. (Project P. 184.)

TABLE 60—STANDARD (HOME-MIXED) RATION CONTAINING CORN *vs.* RATION CONTAINING BUCKWHEAT (REPLACING CORN) *vs.* GRAINS FED SINGLY WITH MASH OF CRUSHED OATS

—		Standard Ration	Buckwheat in ration replacing corn	Grains fed singly
Number of days in experiment		182	182	182
Number of birds in experiment at beginning		15	15	15
Scratch feed, containing cracked corn eaten per bird	lb.	28·27	.....	.....
Scratch feed, containing buckwheat, eaten per bird	"	.....	28·25	.....
Wheat eaten per bird	"	.....	.....	11·28
Oats eaten per bird	"	.....	.....	13·16
Buckwheat eaten per bird	"	.....	.....	12·81
Mash, containing corn meal, eaten per bird	"	21·23	.....	.....
Mash, containing buckwheat, eaten per bird	"	.....	22·78	.....
Crushed Oats eaten per bird	"	.....	.....	14·21
Skim-milk eatern per bird	"	30·69	31·28	18·11
Grit eaten oer bird	"	1·56	1·16	1·27
Shell eaten per bird	"	2·48	2·46	2·48
Green feed eaten per bird	"	20·40	20·82	17·67
Average gain per bird	"	.....	.....	.....
Average loss per bird	"	·23	·47	·04
Number of birds died		.....	1	.....
Average egg production		81·67	80·43	62·4
Statement of Costs				
Scratch feed containing corn at $2.28 per cwt.	$	·644	.....	.....
Scratch feed containing buckwheat at $2.15 per cwt.	$	.....	·607	.....
Wheat at $2.50 per cwt.	$	.....	.....	·282
Oats at $1.80 per cwt.	$	.....	.....	·236
Buckwheat at $1.78 per cwt.	$	.....	.....	·228
Mash containing Corn meal at $2.10 per cwt.	$	·446	.....	.....
Mash containing Buckwheat at $2.23 per cwt.	$	.....	·507	.....
Crushed Oats at $1.80 per cwt.	$	.....	.....	·255
Skim-milk at 20c. per cwt.	$	·061	·062	·036
Grit at 80c. per cwt.	$	·012	·009	·010
Shell, at $1.33 per cwt.	$	·033	·032	·033
Green feed at 30c. per cwt.	$	·061	·062	·053
Total cost of feed per bird	$	1·257	1·279	1·133
Food cost of eggs per dozen	$	·184	·190	·217
Average value of eggs per bird	$	3·019	2·980	2·237
Gain per bird over cost of feed	$	1·762	1·701	1·104

AVERAGE EGG PRODUCTION PER BIRD PER MONTH, AND MONTHLY PRICES

—	Standard ration	Buckwheat in ration	Grains singly	Price per dozen
	eggs	eggs	eggs	cents
December	10·80	10·73	4·46	65
January	13·0	11·0	10·0	55
February	13·06	15·4	10·93	45
March	12·45	13·72	11·90	45
April	17·63	15·18	13·0	35
May	14·72	14·4	12·09	30

The hatching results from the pens fed in this experiment are shown in table 61. These results were taken from the regular matings in which male birds were not alternated.

TABLE 61—HATCHING RESULTS FROM HENS FED STANDARD (HOME-MIXED) RATION CONTAINING CORN *vs.* RATION CONTAINING BUCKWHEAT (REPLACING CORN) *vs.* GRAINS FED SINGLY WITH MASH OF CRUSHED OATS

—	Standard Ration	Buckwheat in ration replacing corn	Grains fed singly
Total eggs set	177	172	134
Number fertile	164	127	118
Per cent fertile	92·65	73·83	88·05
Number of chicks	36	8	19
Per cent total eggs hatched	20·33	4·65	14·17
Per cent fertil eggs hatched	21·95	6·29	16·10

The results indicate that corn was slightly superior to buckwheat from the standpoint of egg production. Corn was much superior to buckwheat from the standpoint of the hatchability of the eggs.

The feeding of a ration of scratch grains and mash containing either corn or buckwheat, such as previously described gave much better results from the standpoint of egg production than a ration consisting largely of the grains mentioned fed singly. The hatchability of the eggs from hens fed grains singly was not quite as good as that from those fed a standard ration containing corn, but was better than that from those fed with buckwheat replacing corn in the ration.

POTATOES AS A SUBSTITUTE FOR CORN MEAL IN THE LAYING MASH

In order to determine the value of small unmerchantable potatoes as a substitute for corn meal in the laying mash the experiment outlined below was carried on.

Pen 7 was fed a scratch grain consisting of two parts cracked corn, two parts wheat and one part oats, and a mash consisting of one part corn meal, one part wheat bran, one part wheat middlings, and one part crushed oats fed in a hopper. Grit, oyster shell, milk, green feed and water were also supplied.

Pen 8 was fed the same scratch grain mixture as pen 7. Instead of receiving a dry mash as pen 7, they were fed, twice a day, a moist mash consisting of equal parts wheat bran, wheat middlings, and crushed oats mixed with boiled potatoes. The proportions fed more were equal parts of potatoes (raw weight) and mash. Grit, oyster shell, milk, green feed and water were also supplied.

This experiment ran from December 1, 1925, to May 31, 1926. There were fifteen birds in each pen until March 1, on that date two birds were removed from pen for breeding purposes.

The results are shown in table 62. (Project P 187.)

TABLE 62—POTATOES AS A SUBSTITUTE FOR CORN MEAL IN THE LAYING MASH

—		Corn meal in mash	Potatoes in mash
Number of days in experiment		182	182
Number of birds in experiment at beginning		15	15
Scratch feed eaten per bird	lb.	27·88	27·41
Mash feed, containing corn meal, eaten per bird	lb.	26·99	.....
Mash feed, without corn meal, eaten per bird	lb.	.....	25·79
Potatoes eaten per bird	lb.	.....	26·04
Skim-milk fed per bird	lb.	28·12	28·12
Grit fed per bird	lb.	1·28	1·16
Shell fed per bird	lb.	2·35	2·51
Green feed fed per bird	lb.	18·70	18·70
Average gain per bird	lb.	0·19	0·20
Number of birds died		.....	.....
Average egg production		85·96	83·71
Statement of Costs			
Scratch feed at $2.28 per cwt.	$	·635	·625
Mash, containing corn meal, at $1.92 per cwt.	$	·518	.....
Mash without corn meal at $1.79 per cwt.	$	.....	·461
Potatoes at 33c. per cwt.	$	.....	·085
Skim-milk at 20c. per cwt.	$	·056	·056
Grit at 80c. per cwt.	$	·010	·009
Shell at $1.33 per cwt.	$	·031	·033
Green feed at 30c. per cwt.	$	·056	·056
Total cost of feed per bird	$	1·306	1·325
Food cost of eggs per dozen	$	·182	·189
Average value of eggs per bird	$	3·160	3·082
Gain per bird over cost of feed	$	1·854	1·757

AVERAGE EGG PRODUCTION PER BIRD, PER MONTH, AND MONTHLY PRICES

—	Corn meal in mash	Potatoes in mash	Price per dozen
	eggs	eggs	cts.
December	11·93	10·93	65
January	11·80	13·46	55
February	14·93	12·33	45
March	13·07	13·07	45
April	16·23	17·23	35
May	18·0	16·69	30

The hatching results from the pens in this experiment are shown in table 63. These results were obtained from the regular matings in which the male birds were not alternated.

TABLE 63—HATCHING RESULTS FROM HENS FED POTATOES AS A SUBSTITUTE FOR CORN MEAL IN THE LAYING MASH

—	Corn meal in mash	Potatoes in mash
Total eggs set	205	189
Number fertile	166	169
Per cent fertile	80·97	89·41
Number of chicks	22	16
Per cent total eggs hatched	10·73	8·46
Per cent fertile eggs hatched	13·25	9·46

The results of one year's work indicate that cooked potatoes are not quite as good as corn meal in the laying mash from the standpoint of egg production. Where corn is high in price and small potatoes are of no commercial value they might be profitable for small flocks where the cost of cooking was not considered.

From the standpoint of the hatchability of the eggs, corn meal is superior to potatoes in the ration.

TURNIPS VERSUS MANGELS VERSUS POTATOES VERSUS EPSOM SALTS FOR WINTER EGG PRODUCTION

The object of this experiment, which was begun this year, is to compare turnips, mangels and potatoes, as green feed, and also to test out Epsom Salts as a substitute for green feed.

Four pens of pullets were used for this experiment. Each group was fed alike excepting for the green feed.

Pen 11 was fed mangels as green feed.

Pen 12 was fed swedes as green feed.

Pen 13 was fed raw potatoes as green feed.

Pen 14 was fed no green feed but was fed Epsom salts in the drinking water at the rate of 1½ to 2 ounces for fifteen birds per day.

This experiment was carried on from December 11, 1925, to April 30, 1926. There were twenty-four pullets in each pen until the first of March. On that date four birds were taken from each pen for breeding purposes. Two birds died in the pen fed on swedes, in April, and these were not substituted. The results are shown in table 64. (Project P 183.)

TABLE 64—TURNIPS VERSUS MANGELS VERSUS POTATOES VERSUS EPSOM SALTS FOR WINTER EGG PRODUCTION

——		Mangels	Swedes	Potatoes	Epsom salts
Number of days in experiment		151	151	151	151
Number of birds in experiment (at beginning)		24	24	24	24
Scratch feed eaten per bird	lb.	23·70	23·98	23·49	23·69
Mash eaten per bird	"	15·72	22·65	16·64	11·65
Skim-milk eaten per bird	"	26·08	26·73	26·08	26·08
Grit eaten per bird	"	·65	·86	·80	·81
Shell eaten per bird	"	1·51	1·72	1·55	1·65
Mangels eaten per bird	"	19·48	.....	.....	.....
Swedes eaten per bird	"	.....	18·46	.....	.....
Potatoes eaten per bird	"	.....	.....	18·39	.....
Epsom salts eaten per bird	oz.	.....	.....	.....	14·95
Average gain per bird	lb.	·55	·25	·77	·14
Number of birds died		.....	2	.....	.....
Average egg production		55·62	65·35	61·50	50·00
Statement of Cost					
Scratch feed at $2.28 per cwt.	$	·540	·546	·535	·540
Mash at $2.10 per cwt.	$	·330	·475	·349	·244
Skim-milk at 20c. per cwt.	$	·052	·053	·052	·052
Grit at 80c. per cwt.	$	·005	·006	·006	·006
Shell at $1.33 per cwt.	$	·020	·022	·020	·021
Mangels at 30c. per cwt.	$	·058	.....	.....	.....
Swedes at 24c. per cwt.	$	.....	·044	.....	.....
Potatoes at 33c. per cwt.	$	.....	.....	·060	.....
Epsom salts at $4 per cwt.	$	.....	.....	.....	·037
Total cost of feed per bird	$	1·005	1·146	1·022	·900
Food cost of eggs per dozen	$	·216	·210	·199	·216
Average value of eggs per bird	$	2·188	2·536	2·414	1·859
Gain over cost of feed	$	1·183	1·390	1·392	·959

AVERAGE EGG PRODUCTION PER BIRD PER MONTH AND MONTHLY PRICES

——	Mangels	Swedes	Potatoes	Epsom salts	Price of eggs per dozen
	eggs	eggs	eggs	eggs	cts.
December	8·41	10·33	8·33	4·12	65
January	9·66	7·45	11·20	6·08	55
February	13·25	14·45	11·12	11·25	45
March	10·2	15·35	16·0	12·35	45
April	14·1	17·77	14·85	16·2	35

The hatching results from pens fed with the different green feeds and Epsom salts are shown in table 65.

TABLE 65—HATCHING RESULTS FROM HENS FED TURNIPS VERSUS MANGELS VERSUS POTATOES VERSUS EPSOM SALTS FOR WINTER EGG PRODUCTION

—	Mangels	Swedes	Potatoes	Epsom salts
Total eggs set	104	151	177	153
Number fertile	85	138	150	99
Per cent fertile	81·73	91·39	84·74	64·70
Number of chicks	7	36	32	15
Per cent total eggs hatched	6·73	23·84	18·07	9·80
Per cent fertile eggs hatched	8·23	26·08	21·33	15·15

Swedes and potatoes were superior to mangels as green feeds from the standpoint of egg production, profit, and hatchability of the eggs. Swedes were somewhat better than potatoes from the standpoint of egg production and hatchability of eggs. Epsom Salts, judging from one year's work, are not a satisfactory substitute for green feed.

POTATOES AS A SUBSTITUTE FOR CORN MEAL IN THE FATTENING RATION

Experiments were carried on during the year with cooked potatoes replacing corn meal in the fattening ration for cockerels fed in crates. Greater and more economical gains were obtained from the use of corn meal. Further work will be done another season and the details published at a later date.

FEEDS FOR FERTILITY, HATCHABILITY AND VIABILITY

Experiments were begun during the year to determine the value of supplementary feeds such as cod-liver oil, raw liver, bone meal, and a combination of cod-liver oil and liver, when fed to breeding hens.

Five pens of hens were used for this experiment.

Pen 18 was used as a check and was fed a standard ration of scratch grain and mash, hopper fed. The scratch grain consisted of two parts cracked corn, two parts wheat, and one part oats. The mash consisted of one part corn meal, one part wheat middlings, one part wheat bran, one part crushed oats, and one-half part beef scrap. Grit and oyster-shell was supplied in hoppers and mangels were fed as green feed. Water was supplied in abundance. Milk was supplied daily.

Pen 16 was fed the same as the check with the addition of one-quarter teaspoon of cod-liver oil per bird daily. The cod-liver oil was fed in a moist mash of the same composition as that fed in the hopper.

Pen 15 was fed the same as the check with the addition of one-half ounce of raw liver per bird daily. The liver was chopped fine and fed by itself. The liver was largely that of beef animals.

Pen 17 was fed the same as the check with the addition of 5 per cent of bone meal to the dry mash.

Pen 21 was fed the same as the check with the addition of one-quarter ounce of raw liver and one-eighth teaspoon of cod-liver oil per bird per day. The liver and cod-liver oil were fed in a moist mash, the mash being the same as that fed in the hoppers.

The experiment was divided into two periods with a week between them. During the first period the hens in each pen were mated with the male bird assigned to their particular pens. During the second period the male birds were changed from pen to pen daily. They were allowed to alternate for a week before eggs were saved for the second period.

The results were as shown in table 66.

TABLE 66—FEEDS FOR FERTILITY, HATCHABILITY AND VIABILITY Project P104 (b)

Pen	Feed	Mating period	Eggs set	Fertile	Hatched	Per cent fertile	Per cent fertile hatched	Per cent total hatched	Per cent chicks alive 3 weeks after hatching
18	Check	Ordinary	378	294	33	77·77	11·22	8·73	63·63
		Males alternated	56	53	19	94·64	35·84	33·92	
16	Cod-liver oil	Ordinary	301	266	124	88·37	46·61	41·19	65·32
		Males alternated	25	24	6	96·00	25·00	24·00	
15	Liver	Ordinary	259	229	38	88·41	16·59	14·67	63·15
		Males alternated	61	54	21	88·52	38·88	34·42	
17	Bone meal	Ordinary	249	150	26	60·24	17·33	10·44	46·15
		Males alternated	48	43	11	89·59	25·58	22·91	
21	Cod-liver oil and liver.	Ordinary	280	268	134	95·71	50·00	47·85	88·80
		Males alternated	80	77	42	96·25	54·54	52·50	

During the period in which the males were not alternated the cod-liver oil and cod-liver oil and liver apparently increased the hatchability of the eggs very materially. Liver and bone meal were less effective. A combination of cod-liver oil and liver also apparently produced stronger chicks.

During the period in which the males were alternated, a combination of liver and cod-liver oil increased the hatchability considerably. Liver had practically no influence, while cod-liver oil and bone meal apparently decreased the hatchability.

Further work is necessary before final conclusions can be drawn.

COST OF REARING CHICKS

The costs of rearing chicks hatched from April 11 to June 3 are as shown in table 67.

TABLE 67—COST OF REARING CHICKS

Number of eggs set	6,580	
Number of chicks hatched	1,686	
Number of chicks reared	737	
Statement of Cost		
6,580 eggs at 50 cents per dozen		$ 274 16
66 gallons kerosene at 25½ cents per gallon		16 83
1,638 pounds hard coal at $20 per ton		16 38
1,032 pounds hard coal at $17 per ton		8 77
169 pounds mash (one part middlings, one part corn meal) at $2.04 per cwt		3 44
108 pounds mash (one part middlings, one-half part bran, one part rolled oats) at $2.65 per cwt		2 86
100 pounds mash (one part middlings, one part corn meal, one part rolled oats) at $2.64 per cwt		2 64
299 pounds mash (one part middlings, one part corn meal, one part rolled oats) at $2.79 per cwt		8 34
778 pounds mash (one part middlings, one part corn meal, one part rolled oats, one-half part bran) at $2.48 per cwt		19 29
4,289 pounds mash (one part middlings, one part corn meal, one part crushed oats, one-half part bran) at $1.88 per cwt		80 63
1,416 pounds mash (one part middlings, one part corn meal, one part ground oats, one part bran, one-half part beef scrap) $2.19 per cwt		31 01
156 pounds rolled oats at $3.83 per cwt		5 97
1,205 pounds chick scratch at $4.40 per cwt		53 02
1,146 pounds grain (one part crimped oats, one part wheat) at $2.80 per cwt		32 08
149 pounds grain (crimped oats) at $2.50 per cwt		3 72
774 pounds grain (one part oats, one part wheat, one part cracked corn) at $2.27 per cwt		17 56
7,934 pounds grain (one part oats, one part wheat, one part cracked corn) at $2.37 per cwt		188 03
13,094 pounds skim-milk at 20 cents per cwt		26 18
Total cost of chicks, labour neglected		790 91
Average cost per chick to November 1		1 073

The cost of rearing chicks was very high this year. The excessive cost was due in part to the poor hatchability of the eggs.

BEST AGE FOR CAPONIZING

Experiments were carried on during the year to determine the best age for caponizing cockerels. The results of this experiment will be published at a later date. (Project P 37.)

BEST DATE FOR MARKETING CAPONS

Birds caponized at ages ranging from six to twelve weeks were divided into two groups on December 3, 1925. One group was killed on December 22 and the second group was killed on March 10, 1926. Results showed that it was more profitable to market the birds during the early winter. (Project P 50.)

CONTROL OF FOWL TYPHOID

Agglutination tests for fowl typhoid were made in September. This test has been made for three consecutive years. Blood samples were taken from September 30 to October 2 with the following results:—

	Number Tested	Number Reacted
Hens	135	12
Cocks	18	1
Pullets	363	45
Cockerels	137	6
Total	653	64

The percentage reactors by years is as follows:—

	Per cent
1924	34.4
1925	3.93
1926	9.8

EGG-LAYING CONTEST

The sixth New Brunswick Egg-Laying Contest was concluded on October 30. Twenty pens of ten birds each competed in this contest. The average production, viz. 183.38 eggs, was the highest average production for any of the Canadian contests excepting the British Columbia contest at Agassiz.

The average production for each year since the Contest began is as follows:

Year	Eggs	Points
1921	152.13	.....
1922	139.43	.....
1923	162.25	.....
1924	165.0	.....
1925	164.7	.....
1926	183.38	185.58

The contest was decided this year by the number of points secured rather than the number of eggs laid. One point was allowed for each egg which averaged 24 ounces to the dozen. One-tenth point was deducted for each ounce that eggs averaged less than 24 ounces to the dozen, and one-tenth point was added for each ounce that eggs averaged over 24 ounces to the dozen. Eggs averaging more than 27 ounces to the dozen were considered as averaging 27 ounces, and eggs averaging less than 20 ounces to the dozen were not counted.

Registration was on the same basis as in previous years. Hens which laid 200 or more eggs averaging 24 ounces or more to the dozen were registered, providing they were typical of the breed they represented.

Seventy-eight hens laid over 200 eggs each. Eighty-four hens had a credit of two hundred or more points. Fifty-two hens qualified for registration. Twenty-six hens were disqualified for registration on account of their eggs not coming up to the standard of 24 ounces to the dozen. Twenty-nine hens died during the year. Forty-two second generation birds were entered. Eight of these died. Fifteen qualified for registration.

The average production of the thirty-four second generation birds that completed the contest was 195.4 eggs and 187.8 points.

The highest producing pens were:—

Name	Address	Breed	Eggs	Points
George Wood	Carters' Point	B.R.	2,232	2,448·5
A. T. Reed	Rollingdam	B.R.	2,318	2,287·3
W. E. B. Tait	Dorchester	B.R.	2,222	2,251·0
M. McD. Steven	Hoyt	B.R.	1,886	2,199·0
John Woods	Bloomfield	B.R.	2,116	2,192·8
H. G. Harrison	Saint John	R.I.R.	1,872	2,127·3

The highest individual records were as follows:—

Name	Address	Breed	Hen No.	Eggs	Points
R. A. Snowball	Chatham	B.R.	189	249	296·7
M. McD. Steven	Hoyt	B.R.	124	235	294·2
George Wood	Carters' Point	B.R.	86	247	292·6
George Wood	Carters' Point	B.R.	82	225	287·7
W. E. B. Tait	Dorchester	B.R.	94	232	287·3
James Monahan	Elmsville	B.R.	29	237	284·2
John Wood	Bloomfield	B.R.	105	223	282·6
John Moore	Mouth Keswick	B.R.	57	247	274·5
George Wood	Carters' Point	B.R.	88	237	274·5
George Danby	North Devon	B.R.	115	226	273·4
A. T. Reed	Rollingdam	B.R.	49	261	271·7
M. McD. Steven	Hoyt	B.R.	121	215	270.1
W. E. B. Tait	Dorchester	B.R.	97	238	269·2
H. G. Harrison	Saint John	R.I.R.	13	240	268·7
George Danby	North Devon	B.R.	113	230	267·1
George Wood	Carters' Point	B.R.	87	210	266·5
H. G. Harrison	Saint John	R.I.R.	20	232	265·3
M. McD. Steven	Hoyt	B.R.	128	210	264·6
George Wood	Carters' Point	B.R.	81	228	263·9
N. W. Eveleigh	Sussex	B.R.	136	270	263·4
John Moore	Mouth Keswick	B.R.	53	216	261·2
James Monahan	Elmsville	B.R.	27	279	260·9
Lloyd Johnston	Nashwaaksis	B.R.	68	213	256·3
James Monahan	Elmsville	B.R.	30	238	254·7
James Monahan	Elmsville	B.R.	26	237	254·2
F. H. Ferguson	Fredericton	B.R.	203	253	251·0
M. McD. Steven	Hoyt	B.R.	127	214	250·2

The list of contestants and individual records of the birds are shown in table 68.

TABLE 68—SIXTH NEW BRUNSWICK EGG-LAYING CONTEST—FREDERICTON, N.B.

Pen No.	Name	Address	Breed	1	2	3	4	5	6	7	8	9	10	F	Total
1	H. G. Harrison	347 Main St., St. John	R.I.R.	183·0	204·0R	240·0R	205·0*	130·0	181·0	212·0R	130·0D	131·0	232·0R	21·0	1,872·0
				205·5	224·1	268·7	251·2	153·7	219·3	217·8	149·2	150·7	265·3	21·8	2,127·3
2	James Monahan	Elmsville	B.R.	251·0R	156·0	236·0R	159·0	102·0	237·0R	279·0	138·0	237·0R	238·0R	24	2,057·0
				244·5	151·7	223·6	158·3	106·7	254·2	260·9	141·5	284·2	254·7	21·7	2,102·0
3	C. M. Peart	Lewisville	B.R.	154·0*	123·0D	186·0	87·0	84·0	142·0*	58·0	184·0	197·0	190·0	14·0	1,419·0
							D	*D*		*D					
				127·2	92·9	147·0	85·6	66·6	153·5	50·8	224·9	169·3	221·5	11·2	1,350·5
4	A. T. Reed	Rollingdam	B.R.	222·0R	211·0R	240·0R	240·0R	230·0R	163·0*	245·0R	231·0R	261·0R	254·0R	21·0	2,318·0
				219·1	209·5	234·5	244·4	223·2	162·7	242·0	220·1	271·7	242·5	17·6	2,287·3
5	John Moore	Mouth Keswick	B.R.	244·0	232·0R	216·0R	207·0	148·0	208·0R	247·0R	198·0	183·0	183·0	23·0	2,089·0
				207·7	233·1	261·2	157·3	137·7	233·7	274·5	208·4	196·0	148·0	22·5	2,081·0
6	L. B. Johnston	Nashwaaksis	B.R.	207·0R	117·0	128·0	159·0	165·0	181·0	233·0	213·0R	177·0	194·0*	28·0	1,802·0
				203·7	143·3	144·6	160·7	198·0	197·6	196·2	256·3	216·6	178·8	26·6	1,922·4
7	A. D. Fownes	9 Marjorie St., Moncton	B.R.	122·0	137·0	195·0	175·0	190·0	177·0	170·0	110·0	93·0	128·0	25·0	1,522·0
				129·0	138·7	184·2	179·8	190·2	175·5	146·3	100·9	85·4	103·8	23·0	1,456·8
8	George Wood	Carters' Point	B.R.	228·0R	225·0R	190·0	227·0	163·0	247·0R	229·0*R	237·0R	261·0	205·0R	20·0	2,232·0
				263·9	287·7	202·6	212·4	158·5	292·6	284·2	274·5	226·3	225·6	20·2	2,448·5
9	W. E. B. Tait	Dorchester	B.R.	260·0	188·0	212·0D	232·0R	217·0R	239·0R	238·0R	134·0	249·0	237·0R	16·0	2,222·0
				237·8	174·6	201·3	287·3	240·7	235·4	269·2	137·7	214·8	237·1	15·1	2,251·0
10	John Woods	Bloomfield Station	B.R.	215·0R	267·0	216·0R	195·0	223·0R	109·0*	196·0	209·0R	246·0	217·0	23·0	2,116·0
				243·2	230·3	244·6	212·4	282·6	97·1	245·9	206·7	213·1	193·3	23·6	2,192·8
11	George Danby	North Devon	B.R.	118·0*	138·0	230·0R	41·0	226·0R	165·0	102·0	43·0	67·0	228·0R	15·0	1,373·0
				109·4	146·5	267·1	36·8	273·4	199·6	114·1	44·4	66·8	241·7	14·6	1,514·4
12	Morris McD. Steven	Hoyt Station	B.R.	215·0R	122·0	131·0	235·0R	189·0	188·0	214·0R	210·0R	194·0	171·0	17·0	1,886·0
				270·1	143·5	138·3	294·2	235·0	193·4	250·2	264·6	183·8	207·5	18·4	2,199·0
13	N. W. Eveleigh	Sussex	B.R.	209·0	165·0*	198·0*	63·0D	101·0*D	270·0R	119·0*	140·0	246·0	169·0	24·0	1,704·0
				178·6	175·5	216·9	69·7	96·3	263·4	117·4	175·9	212·9	135·4	21·9	1,663·9
14	Hayfield Bros.	Oromocto	B.R.	207·0R	182·0	236·0R	206·0	175·0	194·0	194·0	197·0	169·0	189·0D	8·0	1,957·0
				205·8	202·8	230·6	189·4	176·2	177·6	126·0	159·4	126·7	142·9	7·2	1,744·6
15	A. Vye Gibson	Main St., Moncton	W.L.	94·0	72·0	145·0	107·0	171·0	131·0	196·0	133·0	112·0	138·0	24·0	1,323·0
				67·8	51·8	150·6	107·1	172·4	141·2	206·1	165·8	137·8	165·8	29·0	1,395·4
16	Helen Parks	62 Parks St., St. John	W.L.	219·0R	108·0	128·0	215·0	120·0	161·0	121·0	199·0	79·0	242·0R	32·0	1,624·0
				236·1	96·2	160·6	201·2	148·6	171·7	145·6	196·7	102·7	233·6	33·5	1,726·5
17	Experimental Station	Fredericton	B.R.	147·0*	230·0	190·0	226·0**	124·0	154·0	163·0	166·0	200·0R	168·0	37·0	1,805·0
				112·8	179·3	144·1	187·0	85·0	111·2	125·4	133·7	204·9	176·9	31·7	1,492·0
18	R. A. Snowball	Chatham	B.R.	171·0	184·0	29·0*	189·0	218·0R	183·0	139·0	237·0	249·0R	167·0	15·0	1,781·0
				211·2	234·3	27·7	227·0	249·2	162·0	170·6	220·1	296·7	198·8	15·9	2,013·5
19	Mrs. Patrick Graham	Millville	B.R.	141·0	159·0	223·0	97·0	192·0	238·0	206·0	198·0	54·0D	118·0	30·0	1,656·0
				116·2	145·3	198·3	75·0	166·8	179·6	191·7	155·7	37·7	88·9	26·6	1,381·8
20	F. H. Ferguson	Fredericton	B.R.	178·0	165·0D	253·0R	211·0	193·0	188·0	194·0	216·0	186·0	108·0D	26·0	1,918·0
				136·8	184·2	251·0	181·4	177·7	142·6	211·9	196·1	162·8	98·6	22·5	1,765·6
		Totals												Eggs	36,676·0
														Points	37,116·3

NOTE.—The top line of figures refer to eggs, and the bottom line to points.

Abbreviations: R—Registered; * Substitute; D—Dead.

APIARY

Fifty-eight colonies were placed in winter quarters in the fall of 1926. Eighteen of these were stored in a cellar and forty are being wintered in packing cases outside. Twenty of the colonies in packing cases are in the out-apiary at Burton.

The winter of 1925-26 was very long and beekeepers throughout the province lost a great many bees. The bees at this Station wintered fairly well. Sixty-two colonies were placed in winter quarters in the fall of 1925. Three of these died. Eleven came out in the spring in weak condition and were united to other colonies. On account of the cold, backward spring, the bees were not taken out of the cellar until May 1. The clover flow did not begin until July 1.

The forty-eight colonies, spring count, produced 1,937 pounds of honey and three new colonies. This is an average of 40.3 pounds per colony as compared with 25 pounds for 1925. The highest producing colony yielded 123 pounds of honey.

A new out-apiary was established at Springhill with nine package colonies and six over-wintered colonies.

CONTROL OF SWARMING BY DEQUEENING AND REQUEENING

Five colonies that showed preparation for swarming by having larvæ in queen cells, were dequeened, and at the same time all queen cells were destroyed. Nine or ten days later the queen cells were again destroyed and a young laying queen was introduced. Four of the colonies thus treated made no further preparation for swarming. In one colony a cell was apparently overlooked when dequeening, as a small swarm came out before the colony was requeened. This swarm was united back to the parent colony. (Project Ap. 1.)

CONTROL OF SWARMING BY SEPARATION OF QUEEN AND BROOD

Six colonies that showed preparation for swarming by having larvæ in queen cells were treated by separating the queen and brood. All combs containing brood were taken from the brood chamber and replaced by empty combs The queen and the bees shaken from one frame were left in the brood chamber. The combs containing brood were put in an empty super, which was placed above a honey super. This super was separated from the honey super by a queen excluder, and the honey super was separated from the brood chamber by a queen excluder.

Three of the colonies thus treated made no further preparation for swarming. In the fourth colony the old queen was missing when examined nine days after being treated. Possibly she tried to swarm and got lost, or she may have died. Two colonies made further preparation to swarm. In one of the colonies that made no further preparation to swarm, and in two of the colonies that prepared to swarm a second time, virgins laid eggs and considerable difficulty was experienced in clearing the super of bees when it was removed for honey extraction.

This is the second year that these experiments on swarm control have been carried on. In both years the best results have been obtained by dequeening and requeening. On account of these experiments being carried on in the out-apiaries as well as at the Station apiary, it has not been possible to obtain any data of value on the effect of the different manipulations upon the honey crop. (Project Ap. 2.)

METHOD FOR DETECTING PREPARATION FOR SWARMING

When colonies in ten-frame Langstroth hives showed signs of congestion in the spring, the brood chamber was enlarged by adding a shallow super filled with drawn comb. Thereafter, when these colonies were examined at regular intervals of nine or ten days, this shallow super was tipped from the rear in order to determine whether preparations for swarming could be detected by the presence of cells built along the lower edge of the comb in the shallow super. Nine colonies with this double brood chamber made preparation for swarming and in all of these colonies the queen cells were observable on tipping the shallow super. (Project Ap. 5.)

WINTERING IN CELLAR

Twenty-two colonies were wintered in a house cellar. Part of this cellar is partitioned off from the main cellar so that a lower and more even temperature can be maintained. The bees were placed in winter quarters November 30, and taken out May 1. The cellar temperature for the different months is shown in table 69. The results are shown in table 70. (Project Ap. 7.)

TABLE 69—WINTERING IN CELLAR—TEMPERATURES IN DEGREES F.

—	Maximum	Minimum	Average
	°	°	°
December	48	38	43·78
January	46	40	42·73
February	46	40	43·77
March	49	41	44·31
April	50	43	46·21

TABLE 70.—WINTERING IN CELLAR

—	10-frame Langstroth	10-frame Jumbo	8-frame Langstroth
Number of colonies placed in cellar	18	3	1
Condition	Good	Good	Good
Average strength, fall 1925.....frames bees	8·17	7·33	7
Average strength, spring 1926..... "	3·29	1·66	3
Average weight, fall 1925..... lb.	63·11	63·66	60
Average weight, spring 1926..... "	42·35	43·33	35
Average stores consumed..... "	20·76	20·33	25
Number of colonies died	1	0	0
Number of colonies weak and united to other colonies	3	1	0
Number of colonies cover 6 frames in spring	1	0	0
Number of colonies cover 5 frames in spring	2	0	0
Number of colonies cover 4 frames in spring	4	0	0
Number of colonies cover 3 frames in spring	6	0	0
Number of colonies cover 2 frames in spring	2	2	1
Number of colonies cover 1 frame in spring	2	1	0

WINTERING IN FOUR-COLONY CASES

Twelve colonies were wintered in four-colony packing cases at the Station apiary, and twelve colonies in the out-apiary at Burton were wintered under similar conditions. The colonies were placed in packing cases before being fed for winter, viz., October 5. Buckwheat hulls or planer shavings mixed with sawdust were used for insulation. Five inches of packing was used on the bottom and sides, and six inches on top. The top packing was enclosed in sacks. The results are shown in table 71. (Project Ap. 8.)

TABLE 71—WINTERING IN FOUR-COLONY CASES

—	Fredericton Apiary		Burton Apiary	
	10-frame Langstroth	10-frame Jumbo	10-frame Langstroth	10-frame Jumbo
Number of colonies wintered in four-colony cases	10	2	10	2
Condition	Good	Good	Good	Good
Average strength, fall 1925.....frames bees	8·7	8·5	9	9
Average strength, spring 1926..... "	3·4	2·0	3·11	2·5
Average weight, fall 1925..... lb.	73·3	78·0	73·55	74·0
Average weight, spring 1926..... "	46·88	52·0	43·75	46·5
Average stores consumed..... "	26·44	26·0	29·87	27·5
Number of colonies died..... "	0	0	1	0
Number of colonies weak and united to other colonies	2	0	2	0
Number of colonies cover 6 frames in spring.....	0	0	0	0
Number of colonies cover 5 frames in spring.....	3	0	1	0
Number of colonies cover 4 frames in spring.....	3	0	4	0
Number of colonies cover 3 frames in spring.....	1	0	1	1
Number of colonies cover 2 frames in spring.....	1	2	1	1
Number of colonies cover 1 frame in spring.....	2	0	2	0

WINTERING IN TWO-COLONY CASES

Six colonies were packed in two-colony cases at the Station apiary and eight colonies were similarly packed at the Burton out-apiary. The colonies were placed in the packing cases before feeding, viz., October 5. Five inches of packing was used on bottom and sides, and six inches on top. The top packing was kept in bags. Buckwheat hulls or planer shavings mixed with sawdust were used as packing.

The results are shown in table 72. (Project Ap. 9.)

TABLE 72—WINTERING IN TWO-COLONY CASES

—	Fredericton Apiary		Burton Apiary	
	10-frame Langstroth	10-frame Jumbo	10-frame Langstroth	10-frame Jumbo
Number of colonies wintered in two-colony packing cases	4	2	7	1
Condition	Good	Good	Good	Good
Average strength, fall 1925.....frames bees	9	8	9·57	9
Average strength, spring 1926..... "	4	3	3·60	4
Average weight, fall 1925..... lb.	73·66	73·5	73·4	74
Average weight, spring 1926..... "	40·66	49·00	44·2	40
Average stores consumed..... "	33	24·5	29·2	34
Number of colonies died.....	1	0	0	0
Number of colonies weak and united to other colonies	0	0	3	0
Number of colonies cover 6 frames in spring.....	1	0	2	0
Number of colonies cover 5 frames in spring.....	1	0	2	0
Number of colonies cover 4 frames in spring.....	0	1	0	1
Number of colonies cover 3 frames in spring.....	0	0	0	0
Number of colonies cover 2 frames in spring.....	0	1	1	0
Number of colonies cover 1 or less frames in spring...	1	0	2	0

WINTERING IN SINGLE COLONY CASES

Two colonies were packed in single colony cases with four inches of buckwheat hulls on bottom and sides and six inches on the top. The results are shown in table 73. (Project Ap. 10.)

TABLE 73—WINTERING IN SINGLE COLONY CASES

	Fredericton Apiary
Number of colonies packed in single cases	2
Condition	Good
Average strength, fall 1925 ..... frames bees	8·5
Average strength, spring 1926 ..... "	4·0
Average weight, fall 1925 ..... lb.	73·5
Average weight, spring 1926 ..... "	39·0
Average stores consumed ..... "	34·5
Number of colonies died	0

Both colonies came out in good condition in the spring with four frames of bees. These colonies were left in their cases all summer. The cover was raised as necessary when supers were added.

A comparison of the results from wintering bees in the cellar versus in different types of packing cases shows:—

Colonies wintered in packing cases consume more stores than colonies wintered in the cellar.

The spring strength, including weak colonies, on the basis of the average number of frames covered by bees, was in favour of the two-colony cases followed by the single colony cases. The average strength of bees wintered in four-colony cases and in the cellar was practically the same.

The spring strength on the basis of the average number of frames covered by bees after the weak colonies were united, was in favour of the one and two colony cases. The average strength of bees wintered in four-colony cases and cellar was practically the same.

The spring count, after weak colonies were united, estimated on the percentage of the fall count for colonies wintered in different ways was:—

	Per cent
Wintered in cellar	77.27
Wintered in four-colony cases	79.16
Wintered in two-colony cases	71.42
Wintered in one-colony cases	100.00

Since only two colonies were packed in single cases, conclusions should not be drawn from this year's results. The results from the two-colony cases at Burton were not very satisfactory.

Mice and rats did considerable damage in the packing cases.

TWO-QUEEN SYSTEM

The object of this experiment is to determine a satisfactory method of carrying a number of surplus queens through the winter. Four weak colonies were selected for this experiment. Five of the lightest combs were removed from each colony and the bees shaken back into the hive. The remaining five combs were pushed to one side of the hive and the following day a tight division board was placed in two of the colonies and the bees and brood and queens from the two remaining colonies were placed one in each of the divided hives. Separate entrances were provided at the corners of the hives, and an oilcloth cover tacked to the division board was placed beneath the cover and over the frames. Two weak colonies with queens were thus brought together in one hive. The colonies were united the latter part of September.

These colonies were placed in the cellar for winter. In one hive the queens and bees died outright. In the second hive one colony lived and one died. (Project Ap. 12.)

COMPARISON OF DIFFERENT SIZES OF HIVES

This experiment was carried on in the out-apiary at Burton, The brood chamber in the ten-frame Langstroth hives was enlarged as soon as the bees needed the room by the addition of a shallow super. The results are shown in table 74. (Project Ap. 21.)

TABLE 74—A COMPARISON OF DIFFERENT SIZES OF HIVES

1925-26	Burton-Outdoors	
	10-frame Langstroth	10-frame Jumbo
Number of colonies	9	7
Average strength for winter, fall 1925 ..frames bees	9	8·57
Average stores consumed, 1925-26 ..... lb.	29·22	27·14
Average stores left in spring ..... "	19·11	19·14
Average srping strength ..... frames bees	4·11	2·71
Average strength, June 20 ..... "	11·22	7
Average rapidity of increase ..... "	7·11	4·28
Per cent colonies prepared to swarm	66·66	14·29
*Average crop produced ..... lb.	44·5	46·5

*Not including one colony in each group which produced no crop.

PACKAGE BEES AS A MEANS OF STARTING COLONIES

Nine two-pound packages of bees with queens were purchased in the spring of 1926. These were obtained on three different dates, viz., April 30, May 10 and June 11. The first two lots were obtained from W. D. Ackord, Fitzpatrick, Alabama, and the last lot was obtained from F. W. Jones, Bedford, P.Q. These were placed in an out-apiary at Springhill, along with six overwintered colonies. Three of the overwintered colonies had been wintered in packing cases and three in a cellar. The results are shown in tables 75 and 76. (Project Ap. 22.)

TABLE 75—PACKAGE BEES AS A MEANS OF STARTING COLONIES—RESULTS FROM PACKAGES

Date Received	Source	No. of colonies	Average strength June 24	Condition for honey flow	Average crop	Average strength for winter
			fr. bees		lb.	fr. bees
April 30	W. D. Ackord	3	8·33	Fair	68·33	9·66
May 10	W. D. Ackord	3	6·0	Weak	29·33	8·66
June 11	F. W. Jones	3	.....	Very weak	0	8·0

TABLE 76—RESULTS FROM OVER-WINTERED COLONIES

Type of Colony	How wintered	No. of colonies	Average strength June 24	Condition for honey flow	Average crop	Average strength for winter
			fr. bees		lb.	fr. bees
10-frame Langstroth	Packing cases	3	13	Good	62·16	9·33
10-frame Langstroth	Cellar	3	7·33	Fair	51·33	9·66

OUTDOOR VERSUS CELLAR WINTERING

A summary of the results, including the honey production, from colonies wintered in the cellar versus outside in packing cases, is shown in table 77. (Project Ap. 30.)

TABLE 77—WINTERING IN CELLAR VERSUS IN PACKING CASES OUTDOORS

Location of Apiary	Type of Hive	Where wintered	No. of colonies	Average strength fall, 1925	Average strength spring, 1926	Average strength June 20	Average stores fed, fall 1925	Average weight fall, 1925	Weight spring, 1925	No. of colonies prepared to swarm	Average crop, all colonies	No. of colonies produced crop	Average crop from producing colonies
				fr. bees	fr. bees		lb.	lb.	lb.		lb.		lb.
Fredericton	10-frame Langstroth	Cellar	7	8·57	4·28	9·71	19·71	63·0	42·57	3	52·14	7	52·14
Fredericton	10-frame Langstroth	Packing cases.	8	8·75	4·12	10·62	30·25	73·62	42·37	5	50·87	8	50·87
Springhill	10-frame Langstroth	Cellar	3	8·66	3·33	7·33	17·33	63·3	43·66	2	51·33	3	51·33
Springhill	10-frame Langstroth	Packing cases.	3	8·33	4·0	13·0	29·0	74·0	46·66	3	62·16	3	62·16
Burton	10-frame Jumbo	Cellar	2	7·5	2·0	6·5	18·0	64·0	42·5	0	16·75	1	33·5
Burton	10-frame Jumbo	Packing cases.	7	8·57	2·71	7·0	18·0	75·0	47·85	1	39·85	6	46·5

QUEEN REARING

Queens were reared by two methods:—

(1) A queen from No. 87 colony was selected as the queen mother. This queen was hatched in 1924, and this was our most productive colony in 1925. The progeny of this queen were also well marked. On May 18 this queen was removed to a weak colony, No. 128. On July 1 one frame was removed from the brood chamber of No. 128 and replaced with a frame containing three triangular pieces of foundation which projected down about two-thirds of the depth of the frame. By July 12 this foundation was drawn out and filled with young brood and eggs. The lower edge of the foundation was cut back to day-old larvae and this frame of brood was then placed in colony No. 99, which had been made queenless twenty-four hours previously and from which all unsealed brood had been removed. This colony, which is called the cell-builder, was very strong. Five days later, June 17, thirty-two cells were drawn out and being capped. Sixteen of the best of these were cut out and placed separately in mating-boxes. On August 5 twelve queens were found, five of which were laying.

(2) When the frame containing the brood was removed from colony No. 128 on July 12, it was replaced by a frame containing a full sheet of foundation. By July 27 this foundation was drawn out and filled with eggs and larvae. It was then removed from this colony and every second and third row of cells lengthwise and crosswise on one side were destroyed with a sharp knife. This frame was then placed on its flat, prepared side downward over the brood chamber of the cell builder No. 99. The ends were sawn off of the top bar of this frame and inch blocks placed under each corner to enable the bees to draw out the cells. On August 5 thirty cells were developed. Thirteen of the best were selected and placed in mating-boxes. Six cells were not accepted and six queens were successfully reared.

The first method takes a little less time. Both methods produced good queens. (Project Ap. 34.)

FIBRE

Variety tests of fibre flax and hemp were conducted at the Station, and two neighbouring farmers were furnished with sufficient Kentucky hemp seed to grow one acre and one-half acre respectively. This was retted by the farmers and will be broken and scutched at this Station.

Three varieties of flax were sown in triplicate plots one-sixtieth acre each on May 22. J. W. S. yielded 394 pounds fibre, 220 pounds tow, and 531 pounds seed. Pure Line No. 6 yielded 286 pounds fibre, 200 pounds tow, and 545 pounds seed. Riga Blue yielded 280 pounds fibre, 220 pounds tow, and 631 pounds seed per acre.

HEMP—VARIETY TEST

Three varieties of hemp were sown in triplicate plots one-sixtieth acre each on May 22. Kentucky hemp yielded 754 pounds fibre, 460 pounds tow; French hemp yielded 258 pounds fibre, 320 pounds tow; and Russian yielded 188 pounds tow per acre. The Russian hemp appears to have practically no value.

EXTENSION WORK

Interest in the work of this Station as evidenced by the number of daily visitors, attendance at meetings, and correspondence, shows a gradual increase. It was not unusual to observe twenty-five cars at the Station on Sundays during the summer season.

In order to further interest the business men of the province in the work of the Station and the farmers' problems, and at the same time discuss the World's Poultry Congress, a meeting of representatives of the Boards of Trade in the province was held at the Station in July. This meeting was addressed by Dr. J. H. Grisdale, Deputy Minister of Agriculture; F. C. Elford, Dominion Poultry Husbandman; and others.

Meetings of the Federated Women's Institute on the occasion of their annual meeting which was held in Fredericton, the Fredericton Rotary Club, and the exhibitors at the Fredericton Exhibition, were held during the season and were well attended. The Annual Poultry Field Day was held August 26 and attended by sixty-five poultry breeders. The annual excursion of the Normal School students was held in September, and 350 prospective teachers were familiarized with the work of the Station. A number of excursions organized by agricultural societies visited the Farm during the summer, and a large number of farmers were made familiar with the work being carried on at the Station.

A campaign was carried on during the early season to stimulate interest in alfalfa. This crop has been grown at the Station for several years and the success attained seemed to warrant a further investigation of this crop under field conditions such as exist in different parts of the province. Five-pound samples of seed with instructions for growing same were supplied to 152 interested farmers in the province.

Educational exhibits were displayed at the St. Stephen, St. John, Woodstock, and Fredericton exhibitions. Members of the staff assisted in judging at several exhibitions, and delivered addresses on various phases of agriculture at field days, Illustration Stations, farmers' picnics, and Rotary clubs.

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1927