DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
DOMINION EXPERIMENTAL FARMS

EXPERIMENTAL STATION

KENTVILLE, N.S.

REPORT OF THE SUPERINTENDENT

W. SAXBY BLAIR

FOR THE YEAR 1922

Gravenstein apple eleven years from planting.

Printed by authority of the Hon. W. R. MOTHERWELL, Minister of Agriculture, Ottawa, 1923

TABLE OF CONTENTS

OTTAWA
F. A. ACLAND
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1923

EXPERIMENTAL STATION, KENTVILLE, N.S.

REPORT OF THE SUPERINTENDENT, W. S. BLAIR

THE SEASON

The winter of 1921-22 was about normal in sunshine and temperature, with considerably more than the normal snowfall. The spring of 1922 was early, the mean temperature for the first half of April being 3·9 degrees higher than the average. The last snowfall of the season was on March 17, when one and one-half inches fell. There was very little frost in the ground, so that ploughing was possible by April 20. May was bright, with normal temperature and a little less than normal precipitation. June was somewhat warmer than usual. The weather during May and June was favourable for seeding. The precipitation in July and August was considerably greater than normal, favouring the strong growth of all crops. In some cases the extra rainfall broke down the heavy stands of grain. In September the precipitation was about normal, but coming after the soaking of the summer was too much for many potato lands, causing a great deal of rot. Crops, on the whole, were somewhat above the average in yield. The extra precipitation considerably hindered harvesting. The first fall frost was on September 28, when 6 degrees was registered. The fall was quite open and ploughing was possible until the end of November. The first snowfall, occurring on November 27, was of one inch. Sleighing started December 6, and the lowest temperature during that month was 14 degrees below.

METEOROLOGICAL RECORDS, 1922

Months 1922	Temperature, Fahrenheit				Precipitation			Bright Sunshine
	Maximum		Minimum		Rainfall	Snowfall	Total Precipitation	Hours
	Date	Degrees	Date	Degrees	Inches	Inches	Inches	
January	12	49	25	− 9	2·16	10·25	3·185	105·85
February	20	48	18	−22	0·61	23·50	2·96	100·80
March	26	60	2	3	1·85	5·00	2·35	184·35
April	17	66	7	21	2·46	.....	2·46	117·70
May	20 and 31	80	4	27	1·51	.....	1·51	233·75
June	8	87	14 and 16	41	2·48	.....	2·48	205·65
July	13 and 17	86	10	44	5·63	.....	5·63	180·05
August	16	85	10 and 22	48	5·56	.....	5·56	181·30
September	11	81	28	26	2·71	.....	2·71	219·80
October	11	78	22	24	6·38	.....	6·38	117·80
November	12	50	26	26	2·20	1·75	2·375	57·35
December	1	46	20	−14	0·84	39·75	4·815	64·30
Total	.....	.....	.....	.....	34·39	80·25	42·415	1,768·50

ANIMAL HUSBANDRY

SHORTHORN HERD

The pure-bred Shorthorn cattle on hand April 1, 1922, consisted of 19 cows, 5 heifers two years old, 14 heifers one year old, 7 heifer calves, 2 herd bulls, 3 bull calves and 9 steer calves, a total of 59 head.

There were sold during the year, for breeding purposes, four milch cows, three yearling heifers, one herd bull and five young bulls. The price of these averaged $75 each. One young cow and one two-year-old heifer were sold for beef, and two of the steers were transferred to a beef herd, making a total of 17 disposed of during the period from April 1 to December 31, 1922. Fifteen calves were born during the period, and there were no deaths in the herd, so that the total number on hand at the end of the period was 57. These consist of 18 milch cows, 7 heifers two years old, 11 heifers one year old, 9 heifer calves, 1 herd bull, 1 bull calf and 10 steers. These steers were castrated when young and are being grown for baby beef to demonstrate the beef qualities of the dual-purpose Shorthorn.

Nearly all of the cows have been running in the Record of Performance test, the practice being to start all promising ones and qualify as many as possible. None of the cows are forced for records, all receiving the same general care that the average farmer could give. During the period of this report, four cows have qualified in the Record of Performance test. Because of not calving soon enough, four others were prevented from qualifying, and the remaining ones finishing lactation periods did not make milk enough to pass.

SHORTHORN COWS

The tabulated data below show the feed consumed by, and the production of, the twelve Shorthorn cows which completed their lactation periods during the nine months ending December 31, 1922.

It will be seen that there are only three mature cows in this list and that five others are two-year-old heifers, which facts account in part for the low average production. The lowest producer was a four-year-old which has since been sold to a beef herd. All the cows in the herd were raised on the Station and as the object is to try out every heifer for milk production, and then weed out the unprofitable ones, there is always a large percentage of young cows on hand from year to year.

The average milking period was 282·3 days, and the dry period 99 days, making an average of 381 days between calvings. The feed costs cover the period from calving to calving, so that both the dry and the lactation periods are charged against each cow's production.

The average amount of feed consumed is considerably below that of previous years. This is due to the greater number of heifers this year and to the fact that more pasture was available during the summer. The meal mixture was, for the most part, made up of 300 pounds of bran, 200 pounds of ground oats, 200 pounds of cotton seed, and 100 pounds of linseed oil meal. One pound of salt was added to each 100 pounds of meal mixture. This meal mixture was fed, during the lactation period, at the rate of one pound of meal to three pounds of milk produced, and during the dry period, at the average rate of three pounds per day per cow. The average price of feeds per hundred weight during the period was: meal, $2.50; roots and ensilage, 25 cents; green feeds, 25 cents; hay, 75 cents; pasture, $1 per month. Skim-milk was valued at 20 cents per hundred pounds. The price of butter was the wholesale price that prevailed in Nova Scotia from month to month. This seems to be the fair way of computing prices of dairy products, as it compares with the prices the average farmer must take, yet it shows the lowest possible net income or profit for the herd that could be made. Had prices been based on the wholesale price of milk that prevailed in the town, seven cents per quart, our average profit per cow would have been $42.05 instead of $5.35. The highest producing cow would have shown a profit of $83.88 as against $36.77, and the smallest producer would have come within $7 of paying her way, instead of making a loss of $27.62.

Milk Production and Value

Name of Cow	Age in yrs.	Date of dropping calf	Number of days dry	Number of days milking	Total milk in lbs.	Daily average yield of milk, lbs.	Average per cent of fat	Pounds of butter produced	Value of butter	Value of skim-milk	Total value of product
									$ cts.	$ cts.	$ cts.
Kentville Jessamine	8	Sept. 13, 1921	82	321	7533·3	23·46	3·89	344·85	149 32	14 48	163 80
" Victoria	7	Jan. 30, 1922	153	242	5000·6	20·66	4·02	236·68	87 23	9 59	96 82
" Mayflower	5	Mar. 23, 1922	95	267	5676·8	21·26	4·39	293·27	106 09	10 85	116 94
" Jessamine 3rd	4	Oct. 18, 1921	125	263	2805·5	10·66	3·86	127·61	52 53	5 39	57 92
" Fairy 2nd	4	Apr. 20, 1922	115	245	4773·4	19·48	4·29	241·25	87 56	9 13	96 69
" Primrose	4	Mar. 11, 1922	101	281	5655·6	20·12	4·14	275·75	102 70	10 84	113 54
" Lady	3	May 7, 1922	23	177	3667·5	20·72	3·97	171·55	59 71	7 04	66 75
" Susan 2nd	2	Sept. 18, 1921	First calf	364	4790·7	13·16	4·21	237·37	96 95	9 17	106 12
" Meadow Flower 2nd	2	Sept. 29, 1921	"	353	5012·5	14·20	4·25	251·16	100 56	9 59	110 15
" Jessamine 4th	2	Feb. 20, 1922	"	297	5975·8	20·12	3·96	278·83	102 89	11 47	114 36
" Jessamine 5th	2	Nov. 5, 1921	"	296	3069·9	10·37	4·39	158·57	60 76	5 87	66 63
" May 2nd	2	Dec. 7, 1921	"	282	4647·2	16·48	3·85	217·88	81 56	8 92	90 48
Average			99	282·3	4884·6	17·56	4·11	236·23	90 65	9 36	100·01

Feed Consumption and Cost

Name of Cow	Age Years	Date of dropping calf	Amount of meal consumed	Amount of roots and ensilage consumed	Amount of hay consumed	Amount of green feed consumed	Months on pasture	Total cost of feed	Cost to produce 100 lbs. milk	Cost to produce one pound of butter	Profit on one pound of butter	Profit on cow
			lbs.	lbs.	lbs.	lbs.		$ cts.	$ cts.	Cents	Cents	$ cts.
Kentville Jessamine	8	Sept. 13, 1921	2,760	8,490	3,712	925	2	127 03	1 68	36·8	6·4	36 77
" Victoria	7	Jan. 30, 1922	2,058	8,410	2,053	1,100	4	109 92	2 19	46·4	−9·5	−13 10
" Mayflower	5	Mar. 23, 1922	2,233	9,230	3,227	1,100	4¼	102 21	1 80	34·8	1·3	14 73
" Jessamine 3rd	4	Oct. 18, 1921	1,092	8,490	3,588	125	1¼	85 54	3 04	67·0	−25·8	−27 62
" Fairy 2nd	4	April 20, 1922	1,823	9,550	3,227	1,100	4¼	92 61	1 94	38·3	−2·1	4 08
" Primrose	4	Mar. 11, 1922	2,176	7,170	3,442	1,100	4¼	105 03	1 85	38·0	−0·8	8 51
" Lady	3	May 7, 1922	1,423	2,570	1,297	1,100	4¼	53 83	1 46	31·3	3·4	12 92
" Susan 2nd	2	Sept. 18, 1921	2,031	8,490	3,392	1,100	3½	105 74	2 20	44·5	−3·7	38
" Meadow Flower 2nd	2	Sept. 29, 1921	1,923	8,490	3,260	1,100	3½	101 54	2 02	40·4	−0·3	8 61
" Jessamine 4th	2	Feb. 20, 1922	2,040	6,780	2,449	1,100	4¼	84 50	1 41	30·3	6·6	29 86
" Jessamine 5th	2	Nov. 5, 1921	1,551	8,330	2,701	1,100	3	83 85	2 73	52·8	−14·5	−17·22
" May 2nd	2	Dec. 7, 1921	1,881	6,260	2,234	1,100	3½	84 20	1 81	38·6	−1·2	6 28
Average			1,916	7,688	2,882	1,004	3·5	94 66	2 01	41·6	−3·3	5 35

BUTTER FAT CONTENT OF MILK AT DIFFERENT PERIODS OF LACTATION

The object in bringing together the data tabulated below was to determine whether the butter fat content of milk from individual cows is likely to vary materially during any part of the lactation period, and also whether, as the cows advance in age, there is likely to be any change in percentage of butter fat over that of the early periods. The cows in this test have during the different years been fed in a uniform manner particularly with respect to the meal ration. The succulent feed has been roots and ensilage for the most part. The hay has been uniform in quality. There were, at times, changes in feed from roots to ensilage, and sometimes potatoes were fed in small amounts. In the summer green feed supplemented the pasture. It has been noticed that following even a slight change in feed, a noticeable variation of butter fat content may be expected either one way or the other, but that this change is generally only temporary. It is well known that a radical change from one feed to another may react adversely on the animal, hence the advice so often given by feeders that should any change in feed be necessary it should be made gradually, or otherwise temporary derangement of health may result. It will be seen that, as the animal advances in age, there is no apparent difference in the butter fat content of the milk from that produced during the earlier milking periods. It is evident also that in some cases there is no increase in percentage of butter fat in the milk as the lactation period advances and the milk flow lessens. With some animals, however, there is a slightly higher fat content toward the latter part of the lactation period than during the first part of the period.

BUTTER FAT CONTENT OF MILK AT DIFFERENT PERIODS OF LACTATION

Name of Cow, Age and Lactation Period	Average Daily Yield and Fat Test	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average Fat Test for Period
Burnbrae Fairy—														
1st lactation	Milk	9·02	10·23	8·41	7·33	8·14	8·13	6·3	3·15	.....	13·01	13·18	13·34	
Age, 2 years	% fat	3·8	3·8	4·	4·	4·2	4·2	5·6	5·6	.....	3·6	3·5	3·7	3·98
2nd lactation	Milk	15·5	13·42	13·35	13·08	12·61	10·5	6·69	3·75	.....	.....	17·57	16·2	
Age, 3 years	% fat	4·	4·0	4·2	4·2	4·4	5·0	5·0	5·	.....	.....	4·0	4·0	4·13
3rd lactation	Milk	13·11	12·97	11·15	9·09	7·37	.....	.....	.....	19·23	17·41	16·2	15·12	
Age, 4 years	% fat	4·3	4·1	4·4	4·7	5·0	.....	.....	.....	5·0	4·0	4·3	4·5	4·42
4th lactation	Milk	12·88	12·31	12·04	9·91	4·05	.....	18·01	18·28	17·58	15·52	14·19	13·44	
Age, 5 years	% fat	4·3	4·3	4·6	4·9	4·9	.....	4·6	4·4	4·1	3·9	4·4	4·4	4·37
5th lactation	Milk	11·9	11·32	9·85	7·55	4·98	.....	.....	19·77	20·94	18·45	15·3	12·61	
Age, 6 years	% fat	4·2	4·2	4·3	5·	4·6	.....	.....	4·4	4·1	4·2	4·2	4·0	4·34
6th lactation	Milk	13·7	13·3	12·31	7·04	.....	.....	.....	22·3	23·25	20·98	18·68	16·06	
Age, 7 years	% fat	4·	4·	4·	4·	.....	.....	.....	4·0	4·2	4·0	4·0	4·0	4·03
7th lactation	Milk	7·89	.....	.....	.....	.....	.....	19·47	17·5	16·11	15·26	12·96	12·19	
Age 8 years	% fat	4·1	.....	.....	.....	.....	.....	3·7	3·8	4·0	4·0	4·2	4·0	3·96
8th lactation	Milk	.....	.....	.....	.....	.....	16·64	17·45	15·57	12·54	10·9	9·25	7·72	
Age, 9 years	% fat	.....	.....	.....	.....	.....	4·2	3·4	4·0	3·6	4·0	3·7	3·5	3·79
Kentville Jessamine—														
1st lactation	Milk	14·73	19·34	18·73	18·52	18·97	19·61	17·60	13·15	10·74	7·89	5·94	.....	
Age, 2 years	% fat	4·0	3·8	4·0	3·8	3·6	3·8	3·8	4·4	4·3	4·3	5·0	.....	3·95
2nd lactation	Milk	24·07	24·5	21·57	19·93	19·51	19·91	18·02	12·11	7·02	3·06	.....	.....	
Age, 3 years	% fat	4·4	3·6	3·6	3·8	3·7	4·0	4·2	4·3	4·5	4·5	.....	.....	3·94
3rd lactation	Milk	.....	29·39	25·43	23·89	23·98	23·04	20·51	18·2	15·16	10·45	8·06	4·86	
Age, 4 years	% fat	.....	4·2	4·0	3·4	3·3	3·8	3·4	3·6	3·7	3·8	3·2	3·4	3·65
4th lactation	Milk	10·34	8·41	8·11	7·26	5·33	.....	36·5	37·6	34·31	23·76	14·82	13·07	
Age, 5 years	% fat	3·4	3·4	3·4	3·5	3·5	.....	4·0	3·5	3·6	4·0	4·1	3·0	3·66
5th lactation	Milk	31·5	27·67	26·6	19·72	14·53	7·94	.....	.....	.....	35·3	40·62	35·0	
Age, 6 years	% fat	3·9	3·5	3·4	3·3	3·6	3·4	.....	.....	.....	4·	3·8	3·6	3·66
6th lactatiou	Milk	27·86	23·04	17·77	15·5	14·74	10·17	6·91	.....	34·17	39·17	39·96	33·74	
Age, 7 years	% fat	3·8	3·3	3·4	3·4	3·2	3·2	2·8	.....	4·8	4·5	4·0	4·2	3·89

BUTTER FAT CONTENT OF MILK AT DIFFERENT PERIODS OF LACTATION—*Concluded*

Name of Cow, Age and Lactation Period	Average Daily yield and Fat Test	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average Fat Test for Period
Hedgyn Susan—														
2nd lactation	Milk	.....	34·36	38·71	34·99	32·42	31·06	26·75	21·64	19·37	15·48	13·7	8·87	
Age, 3 years	% fat	.....	5·0	4·0	4·2	4·0	4·1	3·9	4·3	4·2	4·2	4·6	4·6	4·12
3rd lactation	Milk	.....	40·2	45·55	40·57	35·18	31·69	26·68	20·79	20·23	15·58	10·01	5·46	
Age, 4 years	% fat	.....	4·0	3·8	4·0	4·0	4·0	4·1	4·2	4·4	4·3	4·8	4·6	4·07
4th lactation	Milk	.....	.....	35·98	33·69	30·68	29·51	27·59	23·72	21·0	15·69	10·96	6·03	
Age, 5 years	% fat	.....	.....	4·0	3·8	3·8	4·1	4·0	4·0	4·5	4·2	4·3	4·0	4·02
5th lactation	Milk	.....	.....	42·54	43·26	36·05	35·21	30·71	26·59	23·33	15·23	7·33	.....	
Age, 6 years	% fat	.....	.....	4·3	4·0	3·6	3·9	4·0	4·5	4·0	4·2	3·2	.....	4·0
6th lactation	Milk	14·76	42·73	47·58	42·76	39·52	34·15	26·33	27·66	26·25	21·78	21·16	18·64	
Age, 7 years	% fat	.....	8·47											
		4·2	4.2 4.0	3·8	3·9	4·0	4·0	4·0	4·3	3·9	4·0	4·3	4·2	4·02
7th lactation	Milk	21.91	16.07	8·94	.....	35·2	48·94	42·75	38·82	34·07	25·48	23·91	25·23	
Age 8 years	% fat	3·9	4.0	4·0	.....	4·2	3·5	4·0	4·3	4·1	4·3	4·4	4·3	4·06
Hillview Victoria—														
5th lactation	Milk	.....	.....	31·76	33·84	28·29	27·14	25·95	23·17	19·33	13·29	4·48	.....	
Age 7 years	% fat	.....	.....	3·5	3·6	3·8	4·0	4·0	4·2	4·2	4·4	4·5	.....	4·02
6th lactation	Milk	.....	.....	38·42	36·88	33·72	30·26	26·03	22·39	18·49	11·53	4·16	.....	
Age, 8 years	% fat	.....	.....	3·5	3·8	3·8	3·8	3·8	4·2	4·2	4·3	4·3	.....	3·86
7th lactation	Milk	.....	29·87	40·93	38·6	36·05	32·99	28·71	23·08	23·61	14·05	6·35	.....	
Age, 9 years	% fat	.....	5·0	3·8	4·1	4·0	4·2	4·1	4·1	4·2	4·2	4·3	.....	4·06
8th lactation	Milk	11·99	6·48	40·95	43·77	38·42	36·44	30·9	24·13	24·53	15·01	13·07	13·13	
Age, 10 years	% fat	4·2	4·6	4·	3·7	3·6	3·8	4·4	4·3	4·2	5·9	4·3	4·6	4·12
9th lactation	Milk	17·17	17·09	16·19	13·17	7·37	.....	33·06	31·02	27·94	22·74	21·35	18·3	
Age, 11 years	% fat	4·2	4·0	4·2	4·3	4·3	.....	4·1	3·9	4·2	4·1	3·8	3·8	4·05
10th lactation	Milk	17·21	15·06	14·66	15·09	14·87	14·44	.....	28·77	28·79	24·98	21·15	20·17	
Age, 12 years	% fat	4·3	4·4	4·0	4·1	4·2	4·0	.....	4·4	3·4	3·7	3·6	4·2	3·96

CALF FEEDING EXPERIMENT

In order to gain some information as to the cost of rearing calves on whole milk, skimmed milk and suckling the cow, a test was undertaken using uniform calves from the Shorthorn cows and including five calves in each lot. The cows used were ones partly dry or ones not in other tests, and at times two calves were allowed to one cow. It was estimated that the suckled calves averaged not more than 10 pounds of milk each per day, which at $2.50 per hundred weight would be 25 cents per day. The skimmed milk was charged at 20 cents per hundred pounds. The meal ration was made up of equal parts of crushed oats, bran and linseed oil meal, costing $2.50 per hundred pounds. The clover hay was charged at $18 per ton, and roots at $5 per ton. The aim was to feed all these calves alike in all respects except the milk, giving them all the meal mixture and hay they would clean up nicely. Because of the season of year when these calves were born, only three received roots as part of their feed. It will be found that calves fed whole milk do not take to meal as early as those fed skimmed milk and that they are satisfied with much less meal. The suckled calves evidently did not get the milk necessary to satisfy them as they consumed more meal than those fed whole milk. The difference in cost of these calves to six months of age is very striking.

Calves Suckled

Name	Sex	Date of Birth		No. days suckled cow	Meal	Hay	Roots	Total Costs	Weight at birth	Weight at 6 mos.	Gain	Cost of 1 pound gain
		Month	Year		lbs.	lbs.	lbs.	$ cts.	lbs.	lbs.		Cents
Kentville Susan 5th	Female	May	1921	177	155	105	.....	49 06	80	420	340	14·41
Kentville Victoria 7th	Female	May	1921	160	218	175	.....	47 02	90	430	340	13·83
Kentville Jessamine 10th	Female	October	1921	180	192	292	200	52 92	75	475	400	13·23
Kentville Colonel	Male	June	1921	160	285	252	420	50 43	80	420	340	14·83
Kentville Dauntless	Male	July	1921	160	390	284	350	53 17	70	380	310	17·15
Average				167	248	221	194	50 52	79	425	346	14·69

Calves Fed Whole Milk

Name	Sex	Date of Birth		Whole Milk	Meal	Hay	Roots	Total Costs	Weight at birth	Weight at 6 mos.	Gain	Cost of 1 pound gain
		Month	Year	lbs.	lbs.	lbs.	lbs.	$ cts.	lbs.	lbs.		Cents
Kentville Pearl	Female	Sept.	1921	2,253	146	113	.....	60·98	77	380	303	20·12
Kentville Susan 6th	Female	Sept.	1921	2,505	209	218	.....	69 80	70	400	330	21·15
Kentville Jessamine 9th	Female	Sept.	1921	2,360	175	162	.....	64 82	85	420	335	19·34
Kentville Revenue	Male	May	1921	2,124	192	147	.....	59 22	80	385	305	19·41
Kentville Flower Boy 2nd	Male	Sept.	1921	2,469	210	190	.....	68 68	75	410	335	20·50
Average				2,342	186	166	.....	64 70	77·4	399	321·6	20·10

Calves Fed Skim Milk

Name	Sex	Date of Birth		Whole milk	Skim-milk	Meal	Hay	Roots	Total Cost	Weight at Birth	Weight at 6 mos.	Gain	Cost of 1 lb. gain
		Month	Year	lbs.	lbs.	lbs.	lbs.	lbs.	$ cts.	lbs.	lbs.	lbs.	cents
Kentville Victoria 6th	Female	March	1921	296	2,414	266	167	.....	20 37	70	380	310	6·57
Kentville Lady 2nd	Female	April	1921	305	2,442	269	188	.....	20 91	70	345	275	7·60
Kentville Fairy 4th	Female	March	1921	304	2,213	213	125	.....	18 46	72	320	248	7·44
Kentville Douglas	Male	March	1921	348	2,335	238	146	.....	20 63	94	380	286	7·21
Kentville Baron 2nd	Male	April	1921	292	2,314	290	202	.....	20 98	80	360	280	7·49
Average	.....	.....	.....	309	2,343	255	165	.....	20 27	77·2	357	279	7·26

Comparison of Different Feeding Methods with Calves—Summary

Average	Days Suckled	Whole milk	Skimmed milk	Meal	Hay	Roots	Cost	Weight at 6 mos.	Cost of 1 pound gain
		lbs.	lbs.	lbs.	lbs.	lbs.	$ cts.	lbs.	cents
Calves suckled	167	.....	.....	248	221	194	50 52	425	14·69
Calves fed whole milk	.....	2,342	.....	186	166	.....	64 70	399	20·10
Calves fed skimmed milk	.....	309	2,343	255	165	.....	20 27	357	7.26

Summary of Results of Breeding for Milk Production

The table below indicates the cows used to establish the herd of Shorthorns at this Station. There is also shown the production of some of the female progeny of the different sires, and a general statement is given of the milk production of the heifers up to the present time.

Shorthorn Cows Purchased

Name	Number times qualified R.O.P.	Average of six years		Best year		Poorest year	
		Milk	Butter	Milk	Butter	Milk	Butter
		Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Hillview Victoria	4	6,971	327	8,695	421	6,160	283
Hedgyn Susan	6	8,532	406	10,864	515	7,072	335
Meadow Flower 24	4 (4 year average).	7,363	320	.....	.....	.....	.....
Meadow Princess	2	5,879	305	.....	.....	.....	.....
Meadow Blossom	1	5,290	249	7,562	366	2,749	128
Meadow Maid	(3 year average).	6,364	307	.....	.....	.....	.....
Burnbrae Fairy	(8 year average).	3,536	167	.....	.....	.....	.....
Louise May 2nd	.....	2,572	112	.....	.....	.....	.....

Lakeview Hero Heifers

Of 12 heifers after Lakeview Hero (whose sire was a Record of Performance bull with 6 Record of Performance heifers, but whose dam had no official milk record) 3 only qualified:—

	Milk Lbs.	Butter Lbs.
Kentville Victoria 2nd, as a 2 yr. old	5,280	248
Kentville Fairy, 3 yr. average	4,520	234
Kentville Fairy 2nd, 3 yr. average	5,004	257

Five had records as follows:—

	Milk Lbs.	Butter Lbs.
Kentville Countess	4,525	204
Kentville Blossom, 4 year average	1,890	94
Kentville Jessamine 2nd	2,331	123
Kentville Jessamine 3rd	2,783	135
Kentville Princess 2nd	2,313	127

The other four were sold for beef, not having given promise of production.

Jilts Denis Heifers

Of sixteen heifers from Jilts Denis (sired by St. Clair, he with 11 daughters qualified, with dam a Record of Performance cow with a record of 11,012 pounds milk, 480 pounds butter, and sired by Hector, another Record of Performance bull, with 6 qualified daughters) five have qualified in the Record of Performance:—

	Milk	Butter	Years
	Lbs.	Lbs.	
Kentville Victoria 3rd	6,909	345	2
Kentville Lady	7,780	373	2
Kentville Jessamine 4th	5,970	278	2
Kentville Susan	5,174	270	2
Kentville Primrose	5,655	275	4

Others that have finished lactation periods are:—

	Milk	Butter	Years
	Lbs.	Lbs.	
Kentville Susan 2nd	4,790	237	2
Kentville Meadow Flower 2nd	5,012	251	2
Kentville May 2nd	4,647	217	2
Kentville Molly	4,751	228	2

Four others are promising heifers now in milk. Three were sold for beef.

MAY DON OF FREDERICTON HEIFERS

May Don of Fredericton was sired by an English-bred bull with no official record, and out of Princess of Northlynd, a Record of Performance cow giving 10,882 pounds of milk and 460 pounds of butter. (This cow has a dam with an official record of 9,293 pounds milk, 392 pounds butter, and a Record of Performance sire and grandsire). Of his seven heifers so far in milk, one has qualified, three are promising, and three were sold for beef.

AUGUSTA BARON HEIFERS—(SIRED BEFORE PURCHASE)

	Milk Lbs.	Butter Lbs.
Kentville Jessamine, 6 yr. average	6,000	267
Kentville Princess, 3 yr. average	6,061	333

MORNING STAR HEIFER (SIRED BEFORE PURCHASE)

	Milk Lbs.	Butter Lbs.
Kentville Victoria, 5 yr. average	5,304	261

KENTVILLE SOVEREIGN HEIFER

	Milk Lbs.	Butter Lbs.
Kentville Mayflower, 3 yr. average	5,709	287

THE RESULTS FROM PROGENY OF THE BEST COWS

—	Total heifers milked	Number good	Number poor
Hillview Victoria	3	3	..
Meadow Maid	1	1	..
Meadow Princess	3	1	2
Meadow Blossom	5	1	4
Burnbrae Fairy	3	2	1
Louisa May 2nd	2	1	1
Meadow Flower	2	1	1
Hedgyn Susan	2	2	..
Kentville Jessamine	3	1	2
Total	24	13	11

HEIFERS FROM TWO OF THE POOREST COWS

Kentville Blossom	2	1	1
Lady Roberts	2	2	..

STEERS

Thirty-two head of grade Shorthorn steers were purchased in the fall and are being finished for beef. These steers have not been sold and will be reported upon at a future date.

SWINE

The Yorkshire breed of swine is kept. Six litters were farrowed during the year from which 40 pigs were raised, 28 of which were sold for breeding purposes.

The meal mixture which has given good results for all breeding stock, and which has been used during the past year, was made up as follows:—

200 pounds	white middlings at $2.15		$ 4 30
100 "	bran "		1 40
100 "	ground oats		2 10
50 "	linseed oil meal at $3.20		1 60
50 "	Gunn's tankage hog meal at $3.50		1 75
Salt			0 10
			$11 25

Cost per 100 pounds, $2.25.
Mangels were charged at the rate of $5.00 per ton.

FEED COST OF BOAR FOR ONE YEAR

The following gives the feed consumption and cost of feeding one boar, Sheldrake, from one to two years of age:—

	Total feed	Average per day	Cost per day	Total cost
	Lbs.	Lbs.	Cents	$ c.
Meal	1,619	4·4	10·0	36·42
Mangels	3,250	9·0	2·2	8·12
Total			12·2	44·54

FEED COST OF BREEDING SOWS

Three breeding sows were carried. They have not had the advantage of a range and have been house fed during the entire year. During the summer and near farrowing time and also while the sows were nursing the pigs, the meal was fed in a slop. During cold weather the meal was fed dry along with mangels, and a drink of warm water given once each day. The skimmed milk fed was charged at the rate of 20 cents per one hundred pounds. The average cost of these sows for the year was as follows:—

	Total feed	Average per day	Cost per day	Cost for one year
	Lbs.	Lbs.	Cents	$ c.
Meal	1,648	4·5	10·1	37 08
Roots	3,100	8·5	2·1	7 75
Skimmed milk	827	2·3	0·5	1 65
Total			12·7	46 48

FEED COST OF TWO YOUNG PIGS FOR PORK

The young pigs were fed and sold for pork. They were valued at $4 each at the start. The feed consumed and costs are given below:—

	Total feed Lbs.	Cost
Two young pigs		$ 8 00
Skimmed milk	1,712	3 42
Meal	1,200	27 00
Mangels	759	1 89
		$40 31
374 pounds pork sold at 16 cents		$59 84
Profit above cost of feed		$19 53

Profit on one pig $9.76.

FIELD HUSBANDRY

THE SEASON

From a study of the records given in the table below it will be seen that the April temperature was about normal, that the May and June temperatures were higher than the average, and that the rainfall for these three months was 1·69 inches less than the average for the same period during the previous eight years. The July and September temperatures were slightly below the average, while August was above. The rainfall during July and August was double the average of that for these months during the previous eight years, while the September rain was less than the average. For the six growing months the rainfall was 3·9 inches above the average for the previous eight years at this Station.

The dry spring favoured the preparation of the soil and all crops were put in without undue delay and in a good seed bed. The dry weather following seeding was not favourable to the germination of small seeds and in many cases the stand of grass and clover was not as thick as had been hoped for. Turnips were an uneven stand in very many cases. The grass was showing the effect of the dry weather early in June but 1·05 inches of rain on the 20th and 22nd, followed by abundant rains in July, relieved the situation and a fairly good crop was harvested. The wet weather caused much delay in harvesting, and in some cases much damage during curing. Grain crops, because of the wet July and August, made abundant straw which lodged badly in many cases, and, because of being lodged and the extremely wet weather during harvest, were gathered with extreme difficulty.

Corn and roots made splendid growth during the summer. The most disappointing crop was the red clover, which, because of the previous dry summer, had not made sufficient root growth to withstand unfavourable freezing and thawing weather during early spring, and so was either killed or did not recover in time to produce a satisfactory crop.

WEATHER CONDITIONS, GROWING SEASON, 1922

Month	Mean Temperature		Rainfall		Sunshine	
	1922	Average of nine years, 1913-21 inclusive	1922	Average of nine years, 1913-21 inclusive	1922	Average of nine years, 1913-21 inclusive
	Degrees	Degrees	Inches	Inches	Hours	Hours
April	39·83	40·16	2·46	3·38	117·70	133·89
May	50·95	43·86	1·51	2·11	233·75	192·10
June	63·78	58·04	2·48	2·65	205·65	188·79
July	65·01	65·57	5·63	2·82	180·05	221·45
August	66·56	64·20	5·56	2·46	181·30	214·08
September	56·2	57·40	2·71	3·03	219·80	179·23
Total			20·35	16·45	1,138·25	1,129·54

SUCCULENT CROPS

The amount of corn ensiled was 222·6 tons, sunflowers 68·1 tons, and oats, peas and vetches 13·2 tons, a total of 303·9 tons of ensilage.

The root crops harvested were 2,034 bushels of turnips, 1,132 bushels of mangels, and 97 bushels of carrots.

HAY

One field of 3½ acres, the second year in hay, produced 7 tons, 1,465 pounds, or 2·21 tons per acre. Six acres adjoining this field yielded 12 tons, 355 pounds, or 2·02 tons per acre. Eight acres of dyked land produced 10 tons, 1,683 pounds, or 1·35 tons per acre, and eleven acres of somewhat similar dyke produced 21 tons, 1,446 pounds, or 1·97 tons per acre. An area of six acres cleared in 1920 and seeded to timothy and clover produced 13 tons, 1,780 pounds, or 2·31 tons per acre. The total hay harvested was 101 tons, 522 pounds.

GRAIN

The grain yield was not as heavy as usual, loss resulting from lodging and from the extra handlings necessitated by the exceedingly wet weather. The total yields were:—

Oats	1,116	bushels
Wheat	63	"
Barley	35	"
Peas	3	"
Spring rye	4	"

a total grain yield of 1,221 bushels.

A COMPARISON OF DIFFERENT FODDER CROPS

This experiment included the growing of corn, sunflowers, turnips, mangels and an oats, peas, vetches mixture, on equal areas of land treated alike in every way. The object of the experiment was to determine the total fodder available from such crops grown under similar conditions, and their relative costs.

The land used was some on which clover had been grown in 1921 with fairly uniform results. One-half acre was given to each crop. The land was manured in the spring with fifteen tons of stable manure per acre, after which the sod was ploughed, disced and harrowed. Commercial fertilizer at the rate of 400 pounds of acid phosphate, 200 pounds of muriate of potash and 150 pounds of nitrate of soda per acre, was then applied, and the ground again cultivated before seeding. The corn and the sunflowers were seeded in rows three and one-half feet apart, the corn at the rate of thirty pounds, and the sunflowers at twelve pounds per acre. The mangels and turnips were seeded in rows two and one-half feet apart at the rates of eight and two pounds per acre respectively.

The oats, peas and vetches were mixed in the proportion of two and one-half bushels of oats, one-half bushel of peas and one-third bushel of vetch, and seeded at this amount per acre. The land was badly infested with wild radish (*Raphanus Rhapanistrum*), which so checked the growth that the yield of green fodder was very light, being only 5·055 tons per acre as compared with a crop of 10 tons per acre grown from a similar mixture on other parts of the farm, on soil of no better fertility.

The Bangholm turnip was used and the Half-Sugar White and Giant Yellow Intermediate mangels. Seeding was done on all plots May 27. The oats, peas, vetches mixture was cut on August 4, the corn and sunflowers September

20, the mangels were pulled October 27, and the turnips October 28. The yields are given in the table below calculated at a per acre rate:—

COMPARISON OF FODDER CROPS

Crop Grown	Yield per acre Tons
Corn, Wisconsin, No. 7	19·8
" Longfellow	20·04
Sunflower, Mammoth Russian	20·8
Oats, peas and vetch	5·055
Turnips	21·28
Mangels	17·59

COST PER ACRE

The cost of growing these various crops was as shown below. In arriving at the cost of manure per acre, it was considered that it should be charged for on the basis of the plant food ingredients contained therein, at the valuation of these ingredients in chemical fertilizers. With nitrate of soda, 15 per cent at $60; acid phosphate, 16 per cent at $20; and muriate of potash, 50 per cent at $50 per ton, the value of a ton of average manure at these prices for fertilizer constituents would be $2.31, arrived at as follows:—

CONSTITUENTS IN ONE TON OF MANURE

——	Value per lb.	Total value
	cts.	$ cts.
8 lbs. nitrogen	20	1 60
5 lbs. phosphoric acid	6½	0 31
8 lbs. potash	5	0 40
		2 31

It would seem therefore that $2.00 per ton, on the average, should fairly well represent the value of stable manure. Fifty per cent of the value is charged to the hoed crop, the balance being charged to future crops.

COST OF GROWING ONE ACRE OF CORN

Rental of land		$ 3 00	
Share of manure, 15 tons per acre at $2		15 00	
Fertilizers—			
Acid phosphate, 400 lbs.	$ 4 00		
Muriate of potash, 200 lbs.	5 00		
Nitrate of soda, 150 lbs.	4 50	13 50	
			$ 31 50
Use of machinery		0 60	
Seed, 30 pounds at $2.10 per bushel		1 12	
Ploughing, 8 hours at 45 cents		3 60	
Discing and cultivating, 4 hours at 45 cents		1 80	
Distributing fertilizer, ½ hour at 45 cents		0 34	
Seeding, 1½ hours at 45 cents		0 67	
Cultivating, 10 hours at 45 cents, 6 hours at 35 cents		6 60	
Hoeing, 20 hours at 25 cents		5 00	
Cutting, 1½ hours at 45 cents		0 67	
Twine, 3 pounds at 25 cents		0 75	
Loading and hauling to silo, 3 hours at 95 cents		2 85	
Cutting and putting in silo, 3 hours at $1.50		4 50	
Kerosene and oil		0 85	29 35
Cost per acre			60 78

Yield per acre, 19 tons and 1,840 pounds, or 19·92 tons.
Cost per ton, $3.05.

COST OF GROWING ONE ACRE OF SUNFLOWERS

Rental of land			$ 3 00	
Share of manure 15 tons per acre at $2			15 00	
Acid Phosphate	400 lbs.	$ 4 00		
Muriate of potash	200 "	5 00		
Nitrate of soda	150 "	4 50	13 50	
				$ 31 50
Use of machinery			0 60	
Seed, 12 pounds at 15 cents			1 80	
Ploughing, 8 hours at 45 cents			3 60	
Discing and cultivating, 4 hours at 45 cents			1 80	
Distributing fertilizers, ¼ hour at 45 cents			0 34	
Seeding, 1½ hours at 45 cents			0 67	
Cultivating, 10 hours at 45 cents, 6 hours at 35 cents			6 60	
Hoeing, 25 hours at 25 cents			6 25	
Cutting, 1½ hours at 45 cents			0 67	
Twine, 3 pounds at 25 cents			0 75	
Loading and hauling to silo, 4 hours at 95 cents			3 80	
Cutting and putting in silo, 3 hours at $1.50			4 50	
Kerosene and oil			0 85	32 23
Cost per acre				$ 63 73

Yield per acre, 20·8 tons.
Cost per ton, $3.06.

COST OF GROWING ONE ACRE OF TURNIPS

Rental of land			$ 3 00	
Share of manure, 15 tons per acre at $2			15 00	
Fertilizers—				
Acid Phosphate	400 lbs.	$ 4 00		
Nitrate of soda	150 "	4 50		
Muriate of potash	200 "	5 00	13 50	
				$ 31 50
Use of machinery			0 60	
Seed, 2 pounds at 50 cents			1 00	
Ploughing, 8 hours at 45 cents			3 60	
Discing and cultivating, 5 hours at 45 cents			2 25	
Distributing fertilizers, ¾ hour at 45 cents			0 34	
Seeding, 3 hours at 25 cents			0 75	
Cultivating, 15 hours at 35 cents			5 25	
Hoeing and thinning, 55 hours at 25 cents			13 75	
Pulling and topping, 25 hours at 25 cents			6 25	
Loading and hauling to storage cellar, 9 hours at 45 cents			4 05	37 84
Cost per acre				$ 69 34

Yield per acre, 851·2 bushels or 21·28 tons.
Cost per bushel, 8·1 cents.
Cost per ton, $3.26.

COST OF GROWING ONE ACRE OF MANGELS

Rental of land			$ 3 00	
Share of manure, 15 tons per acre at $2			15 00	
Fertilizers—				
Nitrate of Soda	150 lbs.	$ 4 50		
Acid Phosphate	400 "	4 00		
Muriate of Potash	200 "	5 00	13 50	
				$ 31 50
Use of machinery			0 60	
Seed, 8 lbs. at 25 cents			2 00	
Ploughing, 8 hours at 45 cents			3 60	
Discing and cultivating, 5 hours at 45 cents			2 25	
Distributing fertilizers, ¾ hour at 45 cents			0 34	
Seeding, 3 hours at 25 cents			0 75	
Cultivating, 15 hours at 35 cents			5 25	
Hoeing and thinning, 55 hours at 25 cents			13 75	
Pulling and topping, 25 hours at 25 cents			6 25	
Loading and hauling to storage cellar, 8 hours at 45 cents			3 60	
				$ 38 39
Cost per acre				$ 69 89

Yield per acre, 703·8 bushels or 17·59 tons.
Cost per bushel, 9·9 cents.
Cost per ton, $3.97.

COST OF GROWING ONE ACRE OF OATS, PEAS AND VETCHES

Rental of land		$ 3 00	
Share of manure, 15 tons per acre at $2		15 00	
Acid Phosphate	400 lbs. $ 4 00		
Muriate of potash	200 " 5 00		
Nitrate of soda	150 " 4 50	13 50	
			$ 31 50
Use of machinery		0 60	
Seed, 2½ bushels oats, ½ bushel peas, ½ bushel vetches		5 58	
Ploughing, 8 hours at 45 cents		3 60	
Discing and Cultivating, 3 hours at 45 cents		1 35	
Distributing fertilizers, ¼ hour at 45 cents		0 34	
Seeding, 1 hour at 45 cents		0 45	
Cutting, 1½ hours at 45 cents		0 68	
Loading and unloading, 3 hours at 45 cents		1 35	
Cutting and putting in silo, 1½ hours at $1		1 50	
Kerosene and oil		0 42	15 87
Cost per acre			$ 47 37

Yield per acre, 10,110 pounds, or 5·055 tons.
Cost per ton, $9.37.

CROP YIELDS FROM FIELD NO. 1

This field has been carried under a three-year rotation until this year, when it was extended to a four-year rotation. Below are given the crops grown and fertilizers applied since the field was broken up, and the cost of crops since 1919. In calculating the various costs, the labour of a man has been charged at 30 cents per hour, and of a horse at 15 cents per hour.

FIELD NO. 1

Year	Crop	How fertilized per acre	Yield per acre
1916	Corn	15 tons manure 1,000 lbs. slag	11·59 tons
	Turnips	2,000 " limestone	838·0 bushels
1917	Oats		42·0 "
1918	Clover and timothy		2·18 tons
1919	Corn	20 tons manure 450 lbs. acid phosphate 150 " nitrate of soda	18·8 "
1920	Oats	300 lbs. acid phosphate 100 " nitrate of soda 2,000 " limestone	74·0 bushels
1921	Hay		3·2 tons
1922	Hay		2·35 "

COST OF ONE ACRE OF CORN, 1919

Rental of land		$ 3 00	
Share of manure, 50% of 20 tons at $2.00 per ton		20 00	
Fertilizer, 450 pounds acid phosphate at $32.00 per ton, $7.20; 100 pounds nitrate of soda at $98.00 per ton, $4.90		12 10	
Seed, 30 pounds at $4.50 per bushel		2 41	
			$37 31
Use of machinery		$ 0 60	
Ploughing, 8 hours at 60 cents		4 80	
Discing and cultivating, 4 hours at 60 cents		2 40	
Distributing fertilizers, ¾ hour at 60 cents		0 45	
Seeding, 1½ hours at 60 cents		0 90	
Cultivating, 10 hours at 60 cents		6 00	
Cultivating, 6 hours at 45 cents		2 70	
Hoeing, 20 hours at 30 cents		6 00	
Cutting, 1½ hours at 60 cents		0 90	
Twine, 3 pounds at 30 cents		0 90	
Loading and hauling to silo, 3 hrs. at $1.20		3 60	
Cutting and putting into silo, 3 hrs. at $1.80		5 40	
Kerosene and oil		1 00	
			35 65
Total cost per acre			$73 16

Yield per acre, 18·8 tons.
Cost per ton, $3.89.

COST OF ONE ACRE OF OATS, 1920

Rental of land	$ 3 00	
Share of manure, 32% of 20 tons at $2 per ton	12 80	
Fertilizer, 100 lbs. nitrate of soda at $78 per ton, $3.90; 300 lbs. acid phosphate at $32.00 per ton, $4.80	8 70	
Seed, 3 bushels at $1.50	4 50	
		$29 00
Use of machinery	$ 0 60	
Ploughing in fall, 3½ hours at 75 cents	2 62	
Twine, 3 pounds at 25 cents	0 75	
Discing and cultivating, 3½ hours at 60 cents	2 10	
Seeding and smoothing, 2½ hours at 60 cents	1 50	
Distributing fertilizer, ¾ hour at 60 cents	0 45	
Cutting, 1½ hours at 60 cents	0 90	
Stooking, 2 hours at 30 cents	0 60	
Loading and unloading, 2 hours at 90 cents	1 80	
Threshing, 7½ hours at 30 cents	2 25	
Kerosene and oil	0 75	
		14 32
Total cost per acre		$43 32

Yield per acre, 74 bushels.
Cost per bushel, 58·5 cents.

COST OF ONE ACRE OF CLOVER HAY, 1921

Rental of land	$ 3 00	
Share of manure, 12% of 20 tons at $2 per ton	4 80	
One-half cost of limestone, 2 tons, applied to oat crop	4 00	
Share of seed	5 40	
		$17 20
Use of machinery	0 60	
Cutting, 1½ hours at 60 cents	0 90	
Raking and tedding, 3 hours at 45 cents	1 35	
Coiling and shaking out, 4½ hours at 25 cents	1 06	
Loading and unloading, 5¼ hours at 95 cents	4 99	
		$ 8 90
Total cost per acre		$26 10

Yield per acre, 3·2 tons.
Cost per ton, $8.15.

COST OF ONE ACRE OF TIMOTHY HAY, 1922

Rental of land	$ 3 00	
Share of manure, 6% of 20 tons at $2.00	2 40	
One-half cost of limestone, 2 tons, applied to oat crop	4 00	
Share of seed	5 40	
		$14 80
Use of machinery	$ 0 60	
Cutting, 1½ hours at 45 cents	0 68	
Raking and tedding, 3 hours at 45 cents	1 35	
Coiling and shaking out, 3 hours at 25 cents	0 75	
Loading and unloading, 4¼ hours at 95 cents	4 27	
		$ 7 65
Total cost per acre		$22 45

Yield per acre, 2·35 tons.
Cost per ton, $9.55.

SUMMER SEEDING FOR HAY AND PASTURE

Six acres of land were cleared and ploughed in June and July and seeded August 7th, 1920. Eight tons of stable manure, 300 pounds of acid phosphate and 2 tons of limestone were applied per acre. The yield was 1 ton 1,340 pounds of hay per acre in 1921, and 2 tons 630 pounds per acre in 1922. This land is now in excellent condition for pasturage, for which purpose it will be used another season.

Another area of 3 acres was seeded July 15th, 1922. Timothy seed, 10 pounds, red clover 5 pounds and alsike 5 pounds per acre were seeded without a nurse crop. The conditions for germination were good and a strong, thick stand of grass was obtained. An adjoining area was seeded on August 12th and 14th and from both seedings excellent stands resulted. Two tons of limestone and 100 pounds of nitrate of soda were used per acre on both these areas before seeding.

The object of this work is to gather information as to the advantage of summer seeding on land cleared after the rush of spring work is through. Such seeding should be done not later than the last of July or very early in August. Limestone at the rate of 2 to 4 tons per acre should be used on such lands before seeding, and, if the land is poor, an application of 100 pounds per acre of nitrate of soda or sulphate of ammonia will promote vigorous growth so that there will be less danger from winter-killing through lifting of the plants by frost.

HORTICULTURE

THE SEASON

The winter of 1921-22 was about normal in sunshine and temperature. Snowfall was fairly heavy, being considerably more than usual. The first snowfall was early, before frost had penetrated the ground to any extent; successive snowfalls kept the ground fairly free from frost.

All fruit trees came through the winter without any injury. The spring might be termed early in that the mean temperature for April was 46·96 degrees and, there being little if any frost in the ground, farming operations, including ploughing and cultivating of orchards, were commenced as early as April 19. Some young apple trees were planted April 27. The mean temperature for the month of May was 61·9 degrees. While the days were warm the night temperature dropped to freezing or below on seven different dates. The thermometer registered two degrees of frost on the night of the 28th. This was the last spring frost.

Buds began to open on apple trees on May 15, and were ready for the first spray by May 18.

The day temperature from May 15 to May 31 averaged 66·7 degrees, the night temperature 41 degrees, giving a mean of 53·85 degrees. This advanced the buds rapidly, and practically all varieties of apples were in full bloom June 3. From June 4 to June 11 inclusive, the day temperature averaged 75 degrees and the night temperature 54·75 degrees, giving a mean of 64·87 degrees. The sunshine for this period totalled 53·80 hours, an average of 6·72 hours per day. The precipitation during this period was only ·34 inches, all on the 4th. Taken as a whole, the conditions for pollination were favourable and a good set of fruit was secured.

A record was taken of the percentage of fruit set on a number of varieties. With the single exception of Blenheims, which gave a very poor set, averaging in seven tests only 1·93 per cent, all fruit set fairly well, the average of twelve other varieties being 18·8 per cent. This percentage of fruit set may be considered good.

The rainfall for the summer was above normal: June, 2·48 inches; July, 5·63 inches; August, 5·56 inches; September, 2·71 inches, October, 6·38 inches; a total for the five months of 22·76 inches, or an average of 4·555 inches per month.

Conditions were favourable for the development of fungous diseases, and apple scab was prevalent.

The apple crop in the three Valley counties was approximately one million six hundred thousand barrels.

THINNING APPLES

For the purpose of securing additional information as to the value of thinning apples where the set of fruit is heavy, tests were made on Wagener trees ten years planted which were carrying a good set of fruit. The aim was to thin the apples to one apple to a fruit spur and to an average of six inches apart on the branches. Five trees were thinned and an equal number left not thinned. The fruit was graded from these trees at picking time, with the result as given in the table below:—

EXPERIMENTS IN THINNING APPLES

—	Thinned to six inches	Not thinned
Average number apples harvested per tree	652	764
Average number apples removed per tree	192	
Per cent Number 1's	59·06	23·15
Per cent Number 2's	33·88	52·35
Per cent Number 3's	4·4	21·4
Per cent Culls	2·66	3·1

ORCHARD FERTILIZER EXPERIMENT

Records from the orchard area devoted to fertilizer tests were secured with regard to tree development and crop of potatoes produced on the different plots. The crop of fruit was light, the trees being yet too young to determine the effect of the various combinations of fertilizers used. The growth measurements of the trees were taken 10 inches from the ground. The table below shows the fertilizers applied at various times. The area fertilized is 100 feet long by 36 feet wide, with the trees in the centre. The cultivated crop was grown on a space 12 feet wide on the outside of each plot. Each plot consists of 2 Gravenstein and 2 Wagener trees or 2 McIntosh and 2 Wagener trees. All the trees were set in the spring of 1913.

POUNDS PER ACRE OF FERTILIZER APPLIED IN 1913, 1914, 1916, 1917, 1919, 1920 AND 1922

Plot	Nitrate of soda 15% N	Acid Phosphate 16% P_2O_5	Basic Slag 11·2% P_2O_5	Muriate of Potash 50% K_2O	Sulphate of Ammonia 20% N	Bone Meal 2½% N	Manure 15 tons per acre 1916-1922	Limestone 2 tons per acre 1916-1919
1	150	350	.....	150	.....	.....	.....	.....
2	150	.....	500	150	.....	.....	.....	.....
3	150	.....	.....	150	.....	500	.....	.....
4	.....	350	.....	150	150	.....	.....	.....
5	150	350	.....	100	.....	.....	.....	.....
6	Check	.....	.....	.....	.....	.....	.....	.....
7	92·3	215·4	.....	92·3	.....	.....	.....	.....
8	138·5	323	.....	138·5	.....	.....	.....	.....
9	150	350	.....	60	.....	.....	.....	.....
10	150	.....	.....	.....	.....	.....	.....	.....
11	Check	.....	.....	.....	.....	.....	.....	.....
12	184·6	430·8	.....	184·6	.....	.....	.....	.....
13	150	350	.....	30	.....	.....	.....	.....
14	Check	.....	.....	.....	.....	.....	.....	.....
15	.....	.....	.....	150	.....	.....	.....	.....
16	150	350	.....	150	.....	.....	.....	.....
17	.....	350	.....	.....	.....	.....	.....	.....
18	.....	.....	.....	.....	.....	500	.....	.....
19	Check	.....	.....	.....	.....	.....	.....	.....
20	.....	350	.....	150	.....	.....	.....	.....
21	.....	.....	500	.....	.....	.....	.....	.....
22	150	.....	500	.....	.....	.....	.....	.....
23	150	.....	.....	150	.....	.....	.....	.....
24	150	350	.....	.....	.....	.....	.....	.....
25	.....	.....	.....	.....	.....	.....	15	.....
26	Check	.....	.....	.....	.....	.....	.....	.....
27	.....	250	250	.....	.....	.....	15	.....
28	.....	.....	500	.....	.....	.....	15	4,000
29	.....	250	250	.....	.....	.....	15	4,000
30	.....	.....	500	.....	.....	.....	15	.....
31	.....	500	.....	.....	.....	.....	15	.....
32	.....	.....	.....	.....	.....	.....	15	4,000
33	.....	500	.....	.....	.....	.....	15	4,000
34	Check	.....	.....	.....	.....	.....	.....	.....
35	.....	.....	500	.....	.....	.....	15	.....
36	150	.....	500	.....	.....	.....	.....	4,000
37	150	250	250	.....	.....	.....	.....	4,000
38	.....	.....	500	.....	.....	.....	.....	4,000
39	150	.....	500	150	.....	.....	.....	4,000
40	Check	.....	.....	.....	.....	.....	.....	.....
41	150	500	.....	.....	.....	.....	.....	4,000
42	150	.....	.....	.....	.....	.....	.....	4,000
43	.....	500	.....	.....	.....	.....	.....	4,000
44	Check	.....	.....	.....	.....	.....	.....	.....
45	150	.....	500	.....	.....	.....	.....	.....
46	Check	.....	.....	.....	.....	.....	.....	.....
47	150	500	.....	150	.....	.....	.....	.....
48	.....	.....	.....	.....	.....	.....	.....	4,000
49	150	500	.....	.....	.....	.....	.....	.....
50	150	.....	500	150	.....	.....	.....	.....
51	.....	500	.....	.....	.....	.....	.....	.....

APPLE YIELD PER ACRE, 1922, AND TREE MEASUREMENTS

Plot	Marketable	Not Marketable	Total	Average Diameter 1922 in inches	
	bushels	bushels	bushels	Gravenstein	Wagener
1	303	0	303	3·58	3·35
2	258	6	264	3·8	3·7
3	300·5	19	319·5	4·4	3·8
4	279	9	288	4·03	4·0
5	315	0	315	4·4	4·05
6	109	15	124	4·6	3·7
7	214·5	13·5	228	3·9	4·12
8	282·5	14·5	297	4·2	3·9
9	290	0	290	4·5	4·2
10	174	7	181	4·9	3·3
11	88	31	119	4·6	3·9
12	328·5	6·5	335	4·9	4·0
13	334	2	336	4·8	3·35
14	118	17	135	3·5	3·2
15	94	13·5	107·5	4·6	3·6
16	281	10·5	291·5	5·0	3·9
17	128	15	143	4·8	2·85
18	171	14	185	4·03	4·3
19	94	30·5	124·5	5·03	4·2
20	145	19·5	164·5	4·1	4·3
21	178	7	185	4·7	4·1
22	164	17	181	5·05	3·9
23	240·5	10·5	251	4·5	4·2
24	204	18·5	222·5	4·5	3·7
25	307·5	21	328·5	4·4	3·7
26	84·5	31	115·5	4·4	3·2
27	389·5	13·5	403	4·2	3·9
28	410·5	26·5	437	4·6	3·5
29	424·5	24·5	449	5·2	3·7
30	361·5	22	383·5	4·0	3·2
31	362·5	22	384·5	4·3	3·3
32	386	26	412	4·2	4·2
33	420	24·5	444·5	5·0	3·6
34	143·5	27·5	171	4·02	3·9
				McIntosh	
35	340	13·5	353·5	3·1	3·2
36	129·5	27·5	157	3·45	3·5
37	160·5	21·5	182	3·3	3·4
38	117	20·5	137·5	4·6	3·9
39	301	21·5	322·5	3·9	3·9
40	82	20·5	102·5	3·5	3·2
41	178·5	22	200·5	3·9	3·2
42	191	10·5	201·5	4·3	3·8
43	184	16	200	3·7	3·8
44	121·5	17	138·5	3·8	2·8
45	204	30·5	234·5	3·4	3·15
46	129·5	22	151·5	3·6	2·4
47	288	17·5	305·5	3·5	3·6
48	238·5	26·5	265	4·1	3·6
49	248	19·5	267·5	2·9	3·2
50	330·5	16	346·5	3·4	3·4
51	188·5	21	209·5	3·2	3·5

MIXING AND APPLYING SPRAYS AND APPLYING DUSTS

In spraying, the first important thing is to know the exact capacity of the spray tank. This can be found by driving the outfit to a perfectly level place and filling the tank with a gallon measure. While doing this, it is well to mark, on the end of the tank, the level for 10, 20, 30 gallons, etc., as these measures will be found very convenient when less than a full tank is needed.

In lime sulphur spraying on the Station, a 1 to 40 solution is used; that is, 1 gallon of lime sulphur and 39 gallons of water. In using this material, the proper quantity of lime sulphur is first placed in the tank and water is then

added. When the tank is about half full, the engine is started in order to mix the solution thoroughly. When poison is used, it is put in just before the tank is full. It is thought that a more uniform distribution of the poison through the solution is obtained if it is mixed up first in water before being put in the spray tank.

Different Bordeaux formulas are in use for spraying. The one that has given the best satisfaction here is the 4-8-40 formula; that is, 4 pounds of bluestone, 8 pounds of lime, and water to make 40 gallons. This excess of lime, 4 pounds over the 4-4-40 formula, practically does away with the yellowing of the leaves and the loss of part of the foliage so characteristic of the older formula. Bluestone is now on the market in three forms, crystal, powdered or crushed, and dehydrated. The crystal and the powdered are of the same strength and it is to these the formula refers: the dehydrated is stronger. Crystal or powdered bluestone contains about 25 per cent of metallic copper; dehydrated about 35 per cent (7·14 pounds of dehydrated is equivalent to 10 pounds of powdered). In general spraying, the powdered form is the best to use. In mixing the ingredients, the proper amount of bluestone is put into the tank first, water is added till the tank is nearly half full, the engine is started and the hydrated lime then sifted into the agitated solution. Better satisfaction has been obtained in the work here from dissolving the powdered bluestone in water, and from mixing the lime up into a thin paste with water and passing it through a strainer, before placing them in the tank. Much less trouble with clogged nozzles results, particularly with the lime.

The liquid is kept agitated at all times when applying these solutions. Most liquid spraying is now done with what is known as the spray gun. This instrument will discharge about twice as much liquid per hour as will the ordinary nozzle, and, consequently, the operator has to move quickly in order to avoid getting too much liquid on the tree. The gun should not be held too close to the tree—seven or eight feet is a good safe distance—or more or less injury to the foliage will invariably result. This has been shown by experiments at this station with light, moderate, and heavy spraying. The hose used is a half-inch in size and about 30 feet long. This enables the operator to get to all sides of the tree and so to cover it much better than if the work were done from one side only. From 200 to 225 pounds has been found the best pressure to use. This breaks the liquid up so finely as to give it a fog-like appearance when it reaches the tree. The top of the tree is first sprayed all the way around; when this is well done the lower limbs are fairly well covered and consequently do not need very much more.

Dusting is now very popular in the Annapolis Valley. There is no doubt but that it is faster than spraying, but it cannot be too strongly stated that too much emphasis should not be placed on the speed with which dusting can be done. In order to secure as good results as with liquid, more time will, it is thought, have to be spent in applying dust than is usually done. All trees, even small ones, should be dusted from both sides. An examination of small trees even, say ten years old, will show that the apples from the side opposite to that on which the dust was applied are not as clean as the others. It has been found that early morning, when the air is calm, and the leaves covered with dew, is the best time to apply dust. Some have had good results by doing the work in the evening. Ideal conditions for dusting are a quiet atmosphere and wet leaves, thus giving the dust a chance to stick. Dusting when a high wind is blowing and leaves are dry is practically a waste of time and material. Several machines for dusting are on the market. A machine to give satisfaction should be capable of throwing out, in the form of a cloud, a large quantity of dust, steadily and without clogging, the quantity easily regulated.

Two dusts are being used in orchard work at present, copper arsenic and sulphur arsenate. Good results have been obtained from each of these. The

fruit from trees dusted with sulphur is brighter and more attractive in appearance than those on which copper dust has been used.

The average cost, per single application on one acre, 40 trees, 25 years old, was as follows:—

Copper arsenic dust	$4 52
Sulphur arsenic dust	5 94
4-8-40 Bordeaux arsenate	5 49
Lime sulphur arsenate	4 09

SPRAYING AND DUSTING, 1922

All peach, plum and cherry trees were sprayed April 7, with lime sulphur, using one gallon of the concentrate to nine gallons of water. This was mainly intended for the control of Peach Leaf Curl and was effectual. Liquid was applied with a Friend gun under 200 pounds pressure; all parts of the trees were thoroughly drenched.

Spraying and dusting of apple trees started May 22. Buds had then just opened, and some leaves were as large as ten cent pieces. About one week was allowed to elapse between sprays and dusts. It was fortunately, possible, to apply all liquid sprays on days that gave the material a chance to dry and adhere to the foliage. All dusting was done in the early morning when the air was still and the leaves damp with dew. Dusting was done with a Lloyd machine driven by a 3 horse-power Fairbanks Morse engine; this proved to be a very satisfactory outfit.

In spraying this year, a Bordeaux mixture was used made up of bluestone, four pounds; lime eight pounds; and water forty gallons. It has been found, by using eight pounds of lime instead of four pounds as in the old formula, that the yellowing of the foliage so characteristic of the old 4-4-40 mixture is practically eliminated. The excess of lime does not decrease the russetting of the fruit to any extent, but no foliage injury is apparent, so it is thought wise to advise this excess of lime rather than the old 4-4-40 formula.

Lime sulphur was again used in the strength of one gallon of the concentrate to thirty-nine gallons of water. About ten pounds of hydrated lime was added to one hundred gallons of this mixture, as experiments in the past have seemed to show an advantage from this addition, foliage injury having been very much decreased where it was used.

Emulso, a preparation of recent introduction for use as a spreader, was added to both lime sulphur and Bordeaux mixtures in certain tests. The results in scab control were no better where this material was used, but observation showed that the mixtures containing it seemed to have covered the foliage more evenly. The check plots in the part of the orchard where Emulso only was used show a scab infestation of only about nine per cent.

No foliage injury resulted from the use of any of the above sprays. All were applied with a Friend gun under a pressure of approximately two hundred pounds, care being taken that the operator did not stand very close to any trees of medium size. In the case of large or fairly tall trees so much care is not necessary, except with the lower limbs.

Properly mixed materials, pressure sufficient to give a fog-like spray through a good nozzle, a well agitated solution, and care in keeping at a reasonable distance from the foliage, should not give any injury to either foliage or fruit when using any of the standard spray mixtures.

Dusting of fruit trees is becoming increasingly popular in the Annapolis Valley, and, judging from results obtained this year under somewhat adverse weather conditions and upon varieties such as McIntosh Red and Gravenstein, there are good grounds for believing that dusting will prove as effective as spraying with liquids, if it is properly done.

Two dusts were used in our work here this year, sulphur arsenate and copper arsenate. The former is made up of 90 pounds of sulphur and 10 pounds arsenate of lead; the latter of 12 pounds of dehydrated copper sulphate, eight pounds of arsenate of lime, and 80 pounds of hydrated lime

Better results have been achieved this year with the copper sulphate dusts and sprays than with those containing sulphur as the chief fungicide. Probably this can be accounted for by the fact that the copper sprays are more adhesive than the sulphur sprays and so tended to be washed off less during the past wet season.

The cost of dusting and spraying was practically the same as last year. For one acre of twenty-five-year-old trees (40 trees) copper arsenate dust, three applications, cost $13.56; sulphur arsenate dust, three applications, cost $17.82; 4-8-40 Bordeaux arsenate, three applications, cost $16.48; lime sulphur arsenate, three applications, cost $12.29.

Too much stress should not be laid on speed in dusting. Enough time should be given the operator to cover the foliage and fruit thoroughly. In the work this year some young McIntosh trees were dusted with both copper and sulphur dusts. These trees were about nine years old and produced a good crop of fruit. The dusting was done in the early morning and from one side of the trees only, as it was thought there would be no difficulty in covering them in that way. It was found later, however, that the fruit on the side opposite that on which the dust had been applied showed a much greater percentage of scab than that on the side next to the machine.

The apples dusted and sprayed with sulphur were much more brightly finished than those sprayed or dusted with copper sulphate. The latter, while not really showing very much russetting, had a dull appearance.

Insect injury was caused largely by sucking insects and was apparently less on the dusted plots than on the sprayed ones. Records taken from the fruit of the young trees show an average of 1·31 per cent of insect injury on the dusted plots, and 3·45 per cent on the sprayed plots. The checks show 4·10 per cent of insect injury. Two plots sprayed with Bordeaux and Emulso, and lime sulphur and Emulso, show insect injury to fruit of 5·82 and 6·86 per cent respectively.

The scab noted averaged 12·22 per cent on the dusted plots and 3·57 per cent on the sprayed plots. Lime sulphur did not give as good control of scab as Bordeaux mixture.

Records were taken mostly from McIntosh and Gravenstein, two varieties very susceptible to scab. A summary of results secured is attached herewith.

SPRAYING AND DUSTING, 1922

Spray or Dust Used	Average results, three applications					
	% Scab	% Insect Injury	% No. 1's	% No. 2's	% No. 3's	% Culls
Sulphur dust, 90-10	15·4	1·27	59·94	19·9	2·87	0·67
Bordeaux dust, 12-8-80	9·04	1·35	70·42	14·8	2·39	1·97
Lime sulphur, 1 to 40, and Arsenate of lime	10·12	2·04	65·92	16·96	3·43	1·4
Bordeaux, 4-8-40 and A. of lime	1·57	4·39	63·39	24·08	4·68	1·84
Checks. No Spray. No dust	53·41	4·10	29·28	7·11	4·34	1·79
Bordeaux, 4-8-40 and Arsenate of lime, with Emulso	1·94	5·82	72·81	15·53	3·88	0·0
Lime Sulphur, 1 to 40 and Arsenate of lime, with Emulso	0·65	6·86	70·58	16·6	5·22	0·0
Bordeaux, 4-8-40 and A. of lime; one application, 3rd only	7·84	0·86	57·66	24·71	5·84	3·06
Bordeaux dust; two applications, 1st and 3rd only	2·08	0·96	32·2	35·42	23·34	5·95

ORCHARD CULTIVATION

A three-year rotation of crops is still practised between the rows of trees on all the young orchard at this Station, except on that portion planted 20 by 20 feet. On this area it was found that the roots of the young trees were occupying practically all the ground; consequently intercropping was discontinued and clean cultivation practised.

On June 8th the young fruit trees were given a dressing of nitrate of soda, two pounds per tree. This material did not arrive in time for the application to be given earlier.

With the idea of economy in carrying out the different operations in connection with fruit growing, the trees have been headed low. This method does not permit of close cultivation after the tree reaches the age of ten years, without possible damage to the tree. It was thought best, therefore, in 1922, to seed down a strip ten feet wide, 5 feet on each side of the tree, leaving sufficient space between the sod strip and the growing crop to allow of cultivation. Grass on the sod strip is cut when about six inches tall and allowed to remain as a mulch.

CHERRIES

During the early years of the cherry orchard, considerable trouble was experienced with the Cherry Leaf Spot, which caused serious defoliation during the summer. This disease, it has been found, can be controlled with the lime sulphur spray. The trees are thoroughly sprayed early in April, when the buds are dormant, with one gallon of concentrated lime sulphur to 9 gallons of water; again with the same material when the petals have fallen, using one gallon to 50 gallons of water; and two weeks later dusted with sulphur dust. If slugs or other leaf-eating insects are likely to be present, one pound of dry arsenate of lead is added to each 40 gallons of liquid used in the after-blossom spray. Since adopting this practice, the foliage has been good throughout the summer.

The cherry crop was fair during the year. Birds, as usual, injured the sweet cherries materially, and continued rain and warm weather when some varieties were nearly ripe resulted in loss from the splitting of the fruit, which renders it useless for market.

The Governor Wood is a hardy, vigorous sort, and is as satisfactory as any of the sweet, yellow varieties. The Napoleon is later and is considerably larger, being the best late, sweet, yellow variety. The earliest of the red sweet cherries is the Early Purple Guigne, ripening early in July. The fruit is not large and much of it is taken by birds before fully mature. The Black Tartarian is still a favourite, and the Windsor is probably the most satisfactory variety for market. The May Duke is the best early cherry of the Duke class. The Royal Duke is one of the best of the medium early Duke cherries, and the Late Duke a satisfactory very late variety. There are various strains of the Montmorency under test, and these show little, if any, difference in quality or appearance. It would seem that the Montmorency is one of the most satisfactory of the sour cherry group. The English Morello is very much later and has a very dark juice, making it particularly desirable for canning.

PEACHES

The outlook for the profitable growing of peaches is not at all promising. The difficulty is not the killing of buds during the winter from a low temperature, but a lack of hardiness due to the wood's not maturing properly during the late summer and fall, on account of lack of sufficient heat to force proper ripening. The prolonged growth does not thoroughly mature, and while buds on properly ripened wood will come through the winter in excellent condition,

the immature wood on the same trees will kill out entirely. The result is that all varieties of peaches are showing a decidedly unthrifty appearance and many are practically killed out. The varieties which are the hardiest are Arp Beauty, Greensboro, Early Canada, Admiral Dewey and Alexander. Peach Leaf Curl is kept under control with lime sulphur, using one gallon of concentrate to 9 gallons of water early in April when the buds are dormant, and thoroughly drenching the trees with the spray.

PLUMS

Fifty varieties of plums fruited during the season. The production was good on most varieties. The market was poor, the supply exceeding the demand considerably. Because of growing only two trees of a variety and not being able to supply any quantity of a uniform grade, the possibility of disposing of the Station's fruit with profit is, at best, not very good. The season ranged from August 19, when Red June was picked, to October 4, when Monarch was harvested.

The Brown Rot of plums is a troublesome disease and weather conditions are often so favourable for its spread about harvest time that much loss results. Dull weather, with much humidity, favours this disease. Persistent spraying with lime sulphur from the time of the formation of the fruit to picking time is of great aid in controlling this fungus. The first spray is given soon after the blossoms have dropped; the second, two weeks later; and the third, one month before the fruit is ripe. For these, 1 gallon of concentrated lime sulphur to 50 gallons of water is used. This is followed by a thorough sulphur dust about ten days before the fruit ripens. While this treatment has not entirely eliminated this trouble, it has very materially reduced it. The fact that there are but few trees of a variety, and that these ripen at different dates, render difficult an entirely satisfactory control of this disease.

Burbank is still the most satisfactory of the Japanese varieties. Grand Duke and Bradshaw are fine large purple plums. Green Gage is one of the best green plums but inclined to run rather small. Washington is a fine quality yellow plum. Monarch is one of the best late purple varieties. Tennant prune and Italian prune are two of the leading prune plums. Several pounds of Tennant prune were dehydrated, in a small way, with good results. The sugar content was not high, but otherwise the product was equal to the California product for cooking.

SMALL FRUITS

GOOSEBERRIES

A plantation of two varieties of gooseberries was set in the spring of 1921, spacing the plants 4 feet by 4 feet. These have made good growth. They yielded some fruit in 1922, as indicated below:—

Variety	Number of plants	Total yield
		quarts
Downing	48	40
Red Jacket	48	37

ENGLISH GOOSEBERRIES

This plantation has not been a success, due to inability to control the gooseberry mildew. The American varieties are quite free from this disease under similar conditions, and it is felt safe to advise the planting of such kinds as Downing and Pearl. Of the thirty-one English varieties grown, the Whitesmith is the most resistant to mildew.

BLACK CURRANTS

The leading varieties of this fruit were planted in the spring of 1921, the plants being spaced 4 feet by 4 feet. These have been handled as a commercial plantation. The yield in 1922 was as follows:— —

Variety	Number of plants	Ready for picking	Total yield
			quarts
Saunders	48	July 15	6
Boskoop Giant	48	" 24	10
Black Victoria	48	" 15	36
Saunders	30	" 20	3

RED CURRANTS

Two varieties were planted in the spring of 1921, spacing the plants 4 feet by 4 feet. These were set as a commercial plantation. The yield in 1922 was:—

	Number plants	Ready for picking	Total yield
			quarts
Fay's Prolific	48	July 17	21
Perfection	48	" 15	8

STRAWBERRIES

In order to gain information as to the production of strawberries the third year after planting, compared with the first crop of fruit produced, the old plantation of several varieties was continued in 1922. The plots were of uniform size. It will be noticed that the second crop averaged much less than the first crop. The plots were kept free from weeds, but even under these conditions, the yield was very much smaller in the second year of fruiting. It seems desirable to have a new plantation coming in every year if a uniform yield is to be hoped for.

STRAWBERRIES—TEST OF VARIETIES

	First Picking 1922	Last Picking 1922	Total Yield 1921	Total Yield 1922	Decrease in yield
			quarts	quarts	quarts
Senator Dunlap	June 21	July 15	97	23¼	73¾
Corsican	" 19	" 15	74	32	42
Arnout	" 24	" 12	70	9¾	60¼
Cordelia	" 21	" 12	64	17½	46½
Kellogs Premier	" 21	" 10	62½	25	37½
Glen Mary	" 22	" 10	61¼	9¼	52
President	" 23	" 17	61	13¾	47¼
Pocomoke	" 21	" 12	58	6¾	51¼
Chesapeake	" 21	" 15	56¼	22¼	34
Portia	" 23	" 15	54¾	21¼	33½
Williams	" 21	" 12	53½	12½	41
Sample	" 21	" 15	52¼	13	39¼
Ophelia	" 28	" 10	46½	5¾	40¾
Brandywine	" 24	" 12	45½	2	43½
Wm. Belt	" 21	" 15	43	10	33
Paul Jones	" 23	" 15	41½	16¼	25¼
Cassandra	" 23	" 15	41	7¾	33¼
Parsons Beauty	" 21	" 7	40¾	7	33¾
Late Champion	" 26	" 18	39½	40¼	+1
Dorman	" 26	" 15	38¼	6	32¼
Jessie	" 26	" 12	36¼	3½	32¾
Dr. Burrill	" 18	" 7	34½	15½	19
Warfield	" 21	" 15	34¼	16¼	18
Desdemona	" 18	" 7	27	11½	15½
Vergilia	" 21	" 10	19½	16	3½

VEGETABLES

LETTUCE

Several varieties of lettuce were planted to determine their comparative value. Seed was sown April 5 under glass, the seedlings transplanted to shallow boxes two inches apart, and these set to the open field May 11. Seed was also sown in the open field on May 11, and some of the plants from this seeding transplanted June 29 to 6 inches apart in the row, and rows 2½ feet apart. The results from these tests are given in the table below. Those tested are placed in the following order of merit: Grand Rapids, All Heart, Crisp As Ice, Iceberg, Big Boston, Giant Crystal Head, Salamander, and Earliest Wayahead.

LETTUCE—TEST OF VARIETIES

——	How Seeded	Date Seeded	Date Planted in field	Ready for use	Weight of 12 heads at maturity	
					lbs.	oz.
Grand Rapids	Greenhouse.	April 5	May 11	June 10	5	
Grand Rapids	Field	May 11	May 11	July 1	3	
Grand Rapids	Field	May 11	June 29	July 20		
All Heart	Greenhouse.	April 5	May 11	June 10	3	8
All Heart	Field	May 11	May 11	July 10	3	4
All Heart	Field	May 11	June 29	Aug. 12		
Salamander	Greenhouse.	April 5	May 11	June 10	5	
Salamander	Field	May 11	May 11	July 15	3	8
Salamander	Field	May 11	June 29	July 30		
Earliest Wayahead	Greenhouse.	April 5	May 11	June 12	4	
Earliest Wayahead	Field	May 11	May 11	July 12		
Earliest Wayahead	Field	May 11	June 29	July 30		
Crisp As Ice	Greenhouse.	April 5	May 11	June 15	6	
Crisp As Ice	Field	May 11	May 11	July 25		
Crisp As Ice	Field	May 11	June 29	Aug. 8		
Black Seeded Simpson	Greenhouse.	April 5	May 11	June 15	3	
Black Seeded Simpson	Field	May 11	May 11	July 12	3	8
Black Seeded Simpson	Field	May 11	June 29	Aug. 5		
Iceberg	Greenhouse.	April 5	May 11	June 15	4	12
Iceberg	Field	May 11	May 11	July 12	2	12
Iceberg	Field	May 11	June 29	Aug. 5		
Big Boston	Greenhouse.	April 5	May 11	June 24	8	8
Big Boston	Field	May 11	May 11	July 15	4	
Big Boston	Field	May 11	June 29	July 30		
Giant Crystal Head	Greenhouse.	April 5	May 11	June 28	7	8
Giant Crystal Head	Field	May 11	May 11	July 10	5	
Giant Crystal Head	Field	May 11	June 29	Aug. 5		

Lettuce Sown at Different Dates

Lettuce seed was started under glass in shallow boxes, the plants later transplanted to similar boxes and finally set to the open field as early as the land could be prepared. Seed of similar varieties was sown in the open ground at the same time the early-started ones were transplanted, and, later, plants from these field-seeded plots were also transplanted. The object was to determine the gain from early seeding under glass as compared with seeding in the open. Later seedings were also made in the open, and plants from these transplanted as well. The Grand Rapids, an open head, and All Heart, a cabbage variety, were used. It will be noticed that the former is in marketable condition about ten days ahead of the latter. These are two satisfactory varieties.

The results given below indicate that the season for lettuce can be extended to cover the whole summer under the cool climatic conditions here. This may not be possible where hot, dry summers prevail. The time that the best growth is obtained is during June and early July. Consequently, very often this desir-

able salad plant is not found after the middle of the summer in many gardens. The tests made with seedings during June and July, however, show that later plants can be grown satisfactorily.

There is no great gain from starting plants for general garden purposes earlier than the latter part of March. Plants started at this time, kept under conditions suitable for vigorous growth, and well hardened off before being planted to the open, are as good as the earlier started plants. Such plants, under good garden conditions, will develop to full maturity by the latter part of June. It would seem, therefore, that a seeding the latter part of March or early in April is desirable, and that seedings to the open early in May, early in June, and early in July will give a continuous supply, and that by transplanting from these seedings the crop may be extended to late fall without difficulty.

LETTUCE SOWN AT DIFFERENT DATES

Variety	How plants started	Date sown	Transplanted to field	First ready for use
Grand Rapids	Under glass	March 4	May 11	June 10
Grand Rapids	Under glass	March 30	May 11	June 10
Grand Rapids	Under glass	April 5	May 11	June 10
Grand Rapids	Field	May 11		July 1
Grand Rapids	Field	May 11	June 29	July 20
Grand Rapids	Field	June 5		Aug. 1
Grand Rapids	Field	June 5	June 30	Aug. 10
Grand Rapids	Field	June 17		Aug. 15
Grand Rapids	Field	June 17	July 20	Aug. 20
Grand Rapids	Field	July 8		Sept. 10
Grand Rapids	Field	July 8	Aug. 5	Sept. 20
All Heart	Under glass	March 4	May 11	June 18
All Heart	Under glass	April 5	May 11	June 28
All Heart	Field	May 11		July 10
All Heart	Field	May 11	June 29	Aug. 10
All Heart	Field	June 5		Aug. 10
All Heart	Field	June 5	June 30	Aug. 12
All Heart	Field	June 17		Sept. 1
All Heart	Field	June 17	July 20	Sept. 1
All Heart	Field	July 8		Sept. 20
All Heart	Field	July 8	Aug. 5	Sept. 30
All Heart	Field	July 20		Sept. 25
All Heart	Field	July 20	Aug. 14	Sept. 30

GARDEN CARROTS

The seed was sown May 11 in rows 18 inches apart. The plants were thinned to 3 inches apart. The maggot of the carrot rust fly was not present during the season, the roots being free from this usually troublesome insect.

Chantenay is one of the best varieties, followed by Nantes and Danvers. The Early Scarlet Horn is satisfactory for very early use.

GARDEN CARROTS—TESTS OF VARIETIES

	Ready for use	Yield from 1 Row 16½ feet long	
		No. roots	Weight
			lb.
Improved Danvers	August 20	64	21·5
Chantenay	August 30	63	16·5
Danvers	August 25	46	16
Ox-Heart	August 28	59	15
Nantes Half-Long	August 25	58	14·5
Intermediate	August 28	54	14·5
Early Scarlet Horn	July 15	–	–

TABLE BEETS

The beets were seeded May 19 in rows 1½ feet apart. The plants were thinned to 3 inches apart in the row. The Early Wonder and Detroit Dark Red are the two best in quality and uniformity.

TABLE BEETS—TESTS OF VARIETIES

Variety	First ready for use	Yield from row 16½ feet long		
		No. roots	Weight	Quality
			lb.	
Early Wonder	July 25	56	18	Good
Detroit Dark Red	July 28	54	12·5	Good
Early Model	July 31	52	11·2	Fair
Cardinal Globe	July 31	46	11·1	Fair
Extra Early Eclipse	July 31	46	10	Fair
Crosby Egyptian	July 31	38	9·5	Fair
Black Red Ball	Aug. 20	44	6	Fair

CABBAGE

A number of varieties of cabbage were started under glass the latter part of March and early in April. These were transplanted to shallow boxes and set to the open ground May 8. Duplicate plots were seeded in the field on May 10 and plants from these were transplanted June 15. The plants were set in rows 2½ feet apart and 18 inches apart in the row. Tar paper discs were used for the control of the root maggot. This method is effective. Corrosive sublimate, one ounce, dissolved in one-half gallon of hot water, in a wooden container, and diluted to make 10 gallons, is also effective for the root maggot. This is poured around the plant at the rate of 2 to 3 ounces per plant, soon after the eggs are noticed. One or two additional applications at intervals of a week may be necessary. The date when the first heads were ready for market and also the weight of six average heads are given in the table below. The two most satisfactory early cabbages are Copenhagen Market and Enkhuizen Glory. Early Summer is one of the best medium late, and Danish Ballhead one of the best of the winter sorts. For large late cabbage Flat Swedish and Brunswick are good. The cabbage worm is controlled by dusting the plants, before the heads have formed to any extent, with an arsenical dust made up of 1 pound arsenate of lead or arsenate of lime mixed with 10 pounds of hydrated lime.

CABBAGE—TESTS OF VARIETIES

Variety	Where seed sown	When seed sown	When trans-planted	First ready for use	Weight six heads
					lb.
Copenhagen Market	Hotbed	Mar. 31	May 8	July 12	12·5
Copenhagen Market	Field	May 10	June 15	Aug. 10	17·13
Enkhuizen Glory	Hotbed	Mar. 31	May 8	July 18	18·6
Enkhuizen Glory	Field	May 10	June 15	Aug. 16	26
Early Jersey Wakefield	Hotbed	Mar. 31	May 8	July 12	12
Early Jersey Wakefield	Field	May 10	June 15	Aug. 16	14
Stanley	Hotbed	Mar. 31	May 8	July 30	9
Stanley	Field	May 10	June 15	Aug. 16	9·8
Early Paris Market	Field	May 10	June 15	Aug. 16	12·1
Early Summer	Hotbed	Mar. 31	May 8	July 31	12
Early Summer	Field	May 10	June 15	Aug. 25	24
Winningstadt	Hotbed	Mar. 31	May 8	July 21	25·1
Winningstadt	Field	May 10	June 15	Aug. 30	16
Succession	Hotbed	April 5	May 8	Aug. 5	22·5
Succession	Field	May 10	June 15	Aug. 30	27
Autumn King	Hotbed	Mar. 31	May 8	Aug. 10	18·2
Autumn King	Field	May 10	June 15	Aug. 30	17·5
Flat Swedish	Hotbed	Mar. 31	May 8	Aug. 15	35
Flat Swedish	Field	May 10	June 15	Sept. 15	20
Fottlers Improved Brunswick	Hotbed	April 5	May 8	July 31	38·
Fottlers Improved Brunswick	Field	May 10	June 15	Sept. 15	26·1
Marblehead Mammoth	Hotbed	April 5	May 8	Aug. 15	31·2
Marblehead Mammoth	Field	May 10	June 15	Sept. 15	28
Perfection Savoy	Hotbed	April 5	May 8	Aug. 5	28·3
Perfection Savoy	Field	May 10	June 15	Sept. 15	30
Danish Ballhead O–1193	Hotbed	Mar. 31	May 8	Aug. 20	37·1
Danish Ballhead O–1193	Field	May 10	June 15	Sept. 30	34
Danish Ballhead O–934–23	Hotbed	Mar. 31	May 8	Aug. 25	29
Volga	Hotbed	Mar. 31	May 8	Aug. 30	21·2
Delicatesse Red	Hotbed	April 5	May 8	Aug. 12	28

Seed Started Under Glass at Different Dates.—In order to gain information as to the advisability of starting plants very early and carrying them in the hot bed until planting out time, seed of similar varieties was sown on the dates given in the table below. The results would show that there is no great advantage in starting the plants earlier than the latter part of March. The plants were set to the open ground on May 8.

CABBAGE—STARTED EARLY UNDER GLASS

Variety	Seed sown	First ready for use	Per cent of heads planted marketed in July	Average weight per head
				lb.
Copenhagen Market	Mar. 15	July 15	58	2·8
Copenhagen Market	Mar. 22	July 18	93	1·3
Copenhagen Market	Mar. 31	July 12	74	2·1
Enkhuizen Glory	Mar. 15	July 18	69	2·7
Enkhuizen Glory	Mar. 22	July 25	53	3·6
Enkhuizen Glory	Mar. 31	July 18	56	3·1

CAULIFLOWER

The season, although wet, was not suitable for cauliflower and many poorly matured heads were harvested. The Snowball and Early Dwarf Erfurt, two of the best varieties, were grown. The table below indicates the tests made with these varieties:—

CAULIFLOWERS—TEST OF VARIETIES

Variety	Where sown	When sown	When trans-planted	First ready for market	Weight of six heads
					lb.
Early Dwarf Erfurt	Hotbed	Mar. 22	May 8	July 1	4·7
Early Dwarf Erfurt	Hotbed	Mar. 31	May 8	July 1	4·1
Early Dwarf Erfurt	Field	May 10	June 16	Aug. 15	3·1
Early Snowball	Hotbed	Mar. 31	May 8	July 1	4
Early Snowball	Field	May 10	June 16	Aug. 21	4·2

GARDEN PEAS

The trial plots of peas were seeded May 10 in rows 2½ feet apart, two rows 33 feet long being seeded to each variety. The seeds were planted one inch apart. The vines were not supported. Half the area was harvested for green peas, and the other half allowed to ripen for seed. The pea moth caused a great deal of injury in these latter plots in many cases the worms in the seeds making them useless for seeding. The dates of harvest and the yields were as given below. The variety Gregory's Surprise is one of the earliest, followed closely by Thomas Laxton, which is a much better pea than Surprise. Gradus is one of the standard sorts, and also Excelsior. Advancer is a good mid-season sort, and Stratagem is one of the best late varieties.

GARDEN PEAS—TEST OF VARIETIES

	Height	When ready for use	Weight of pods, one row, 33 ft.	Weight of ripened seed, one row, 33 ft.	Pea moth injury
	Feet		lb.	lb.	per cent
Alaska	1½	June 30	5·6	1·9	8
Carters Eight Weeks	1½	July 4	5·2	2·2	19
Gregory's Surprise	3	July 7	13·3	2·8	25
Little Marvel	2	July 9	7·1	2·5	13
Thomas Laxton	3	July 9	7·1	2·2	20
Thomas Laxton O–1648–63	3	July 9	8·4	2·1	21
Pioneer	1½	July 10	14·8	2·9	29
English Wonder	1½	July 11	17·7	3·4	15
American Wonder	2	July 11	11·7	1·6	5
Laxtonian	2	July 11	9·7	1·8	14
Gradus	3	July 12	8·8	2·4	15
Sutton's Excelsior	2	July 13	11·4	3·2	20
Blue Bantam	1½	July 13	7·8	1·5	11
Advancer	2	July 18	17·1	4	10
Lincoln	1½	July 19	22·5	4	27
Quite Content	3½	July 21	12·1	1·6	28
Harrison Glory	3	July 28	14·7	6	22
Stratagem	3½	July 30	20·7	4·5	15

Sown at Different Dates.—The object of this test is to determine the value of seeding at different dates to extend the season for green peas. To compare with these, a medium and a late variety were sown at the same time. The rows were each 50 feet long, and duplicate plots were grown to determine the crop of

ripened seed. It will be noticed that to seed medium and late maturing sorts at the same time will give as good results as seeding one early maturing variety at different dates. The seed was planted one inch apart in rows 2½ feet apart. Because of the wet season and a heavy growth of vine, many pods of Stratagem were injured by mildew.

GARDEN PEAS—SOWN AT DIFFERENT DATES

Variety	When sown	Ready for use	Yield from one row fifty feet long	Yield of ripened seed, one row, fifty feet long	Pea moth injury
			lb.	lb.	per cent
Thomas Laxton	May 10	July 9	19·0	4·5	23
Thomas Laxton	May 15	July 11	24·3	2·1	34
Thomas Laxton	May 25	July 17	14·0	2·7	11
Thomas Laxton	June 2	July 20	9·8	2·7	15
Advancer	May 10	July 20	38·12	7·2	20
Stratagem	May 10	July 30	22·8	2·5	23

CELERY

The celery crop this season was unsatisfactory. The seed was sown in flats March 22. The seedlings did not grow vigorously and, after being transplanted to other flats, their development seemed to be stunted. They were transplanted to the field on May 19. Celery rust appeared on June 7. This disease evidently was present in the seed flats and had become well established before the plants were set to the field. The plants were sprayed with Bordeaux mixture several times after being set out, but the disease could not be held in check. It is evident that the plants in the seed flat and the seedlings transplanted to flats should be sprayed with Bordeaux to obtain proper control. It is apparent that the disease is carried in the seed, as one strain of Golden Self-Blanching was free from disease throughout the entire season, the plants from this seed having evidence of vigour and health during the whole growing period. It is important to have vigorous growth in the plants before setting to the open if satisfactory early celery is to be obtained. For late celery, seeding the middle of April and planting to the field during the early part of June has given good results. The White Plume, Golden Self-Blanching and Winter Queen are three of the best varieties tested.

ONIONS

The tables below give data secured from the onion seed started under glass and transplanted, as compared with seed sown in the ground early in the spring. It has been found here that onions seeded in the field do not mature before cool and, usually, damp fall weather sets in but continue to make growth during this period, resulting in an immature product, a large part of which is unsuitable for market. The results secured would indicate that the only satisfactory way to grow onions in the Atlantic provinces is to start the seed in shallow boxes about the middle of March and transplant from these to the open field early in May. Plants so handled make their growth early and mature before the unfavourable fall weather sets in. For this purpose it will be found that Prize-taker, Denia, Excelsior and Ailsa Craig are the most satisfactory. All the crop from onions handled this way was marketable.

When set to the open ground, the plants are spaced 3½ to 4 inches apart. Plants from seed sown in the open are thinned to 1½ inches apart. It is found that to crowd the plants seeded in the field forces early maturity. The practice is to place the rows one foot apart and to do all weeding with the hand wheel-hoe and by hand. Seeding was done in the field on May 10. The setting out

to the field of plants started under glass was done on May 11. When seeding in boxes for transplanting, it is a good plan not to seed too thickly, as the larger the resulting seedlings the better. It will be noticed that the exhibition onions were once transplanted in the greenhouse, spacing them 2 inches apart. This gives a strong, vigorous plant for setting to the open. All the onions were grown under similar soil conditions. Because of poor germination it is difficult to secure even stands on field seeded plots. The crop from the various plots was harvested September 12.

Seeded in field May 10.

ONIONS—TEST OF VARIETIES

Variety	Yield from one Row, 16½ feet long		
	Number bulbs marketable	Number bulbs not marketable	Weight of marketable bulbs
			lb.
Yellow Globe Danvers G	77	21	19·5
Large Red Wethersfield	69	32	15·5
Southport Red Globe St. B	55	51	15·0
Yellow Globe Danvers St. B	56	56	12·0
Large Red Wethersfield 0–988	45	69	11·1
Yellow Globe Danvers R	60	68	11·0
Selected Red Globe D & F	51	64	10·5
Prizetaker	36	60	10·2
Yellow Globe Danvers 0–931–2	54	54	10·0
Southport White Globe D. & F	43	13	9·5
Ailsa Craig	45	60	7·4
Australian Brown	32	57	6·5
Southport White Globe	27	20	6·0
Southport Red Globe	25	58	6·2
Southport Yellow Globe	27	76	6·0
Large Red Wethersfield McD	24	34	6·3
Prizetaker St. B	23	54	4·0

Seed sown under glass. Seedlings transplanted to field May 11:—

ONIONS—STARTED UNDER GLASS

Variety	Yield from one Row, 16½ feet long		
	Seed sown	Number bulbs marketable	Weight
			lb.
Prizetaker	Feb. 4	53	39·5
Denia	Feb. 4	48	36·7
Cranstons Excelsior	Feb. 4	44	32·5
Ailsa Craig	Mar. 4	52	39·0
Prizetaker	Mar. 4	47	29·5
Cranstons Excelsior	Mar. 4	49	28·5
Cranstons Excelsior	Mar. 22	54	31·5
Selected Red Globe	Mar. 22	53	28·7
White Globe	Mar. 22	55	28·5
Giant Yellow Prizetaker St. B	Mar. 31	49	25·1
Yellow Globe Danvers 0–932–2	Mar. 31	53	23·4
Yellow Globe Danvers St. B	Mar. 31	54	23·2
Giant Yellow Danvers	Mar. 31	51	23·4
Ailsa Craig	Mar. 31	52	21·5
Southport Red Globe	Mar. 31	50	21·5
Southport White Globe	Mar. 31	49	21·4
Large Red Wethersfield 0–988	Mar. 31	49	16·0
Australian Brown	Mar. 31	48	12·0
Giant Yellow Prizetaker St. B	April 5	50	30·5
Southport White Globe	April 5	55	27·0
Southport Yellow Globe	April 5	54	26·5
Southport Red Globe	April 5	60	26·1
Ailsa Craig	April 5	50	23·0
Yellow Globe Danvers	April 5	49	21·5

SEED SOWN AT DIFFERENT DATES

Variety	Sown under Glass Transplanted to Field, May 11th Yield from Row 16½ Feet Long, 1 Foot Wide 1–2640 Acre			
	Seed sown	Bulbs marketable	Weight from row	Yield per acre
		No.	lb.	Bush.
Prizetaker	Feb. 4	53	39·5	2,085
Prizetaker	Mar. 4	47	29·5	1,557
Cranstons Excelsior	Feb. 4	44	32·5	1,716
Cranstons Excelsior	Mar. 4	49	28·5	1,504
Cranstons Excelsior	Mar. 22	54	31·5	1,663
Ailsa Craig	Mar. 4	52	39·0	2,059
Ailsa Craig	Mar. 31	52	21·5	1,135
Ailsa Craig	April 5	50	23·0	1,214

Onions for Exhibition.—In order to grow large onions for exhibition purposes, seeds were planted on February 4th and March 4th in the greenhouse. The seedlings were transplanted to shallow boxes on April 5th and were set

Onion plots in the vegetable garden. Yield 1,500 bushels per acre.

to the field on May 10. The plants were large and well developed. They were set in rows 2 feet apart. Some were set 12 and others 18 inches apart in the rows. The bulbs were all perfectly matured and many weighed over 2 pounds each. The yields were as given below:—

ONIONS FOR EXHIBITION

Variety	When sown	Distance Apart		Yield From Plot 16½ by 2 Feet			Yield per acre
		In the row	Between the rows	Number of bulbs	Weight of bulbs	Average weight of bulbs	
		feet	feet		lb.	lb.	bush.
Denia	Feb. 4	1·5	2	13	28·5	2·2	752
Denia	Feb. 4	1·0	2	16	27·5	1·7	726
Prizetaker	Feb. 4	1·5	2	13	28·0	2·1	739
Prizetaker	Mar. 4	1·0	2	16	21·5	1·3	567
Cranstons Excelsior	Feb. 4	1·5	2	13	22·5	1·7	594
Cranstons Excelsior	Feb. 4	1·0	2	16	23·0	1·4	607
Cranstons Excelsior	Mar. 4	1·0	2	16	19·5	1·2	514
Ailsa Craig	Mar. 4	1·5	2	13	26·5	2·0	699
Selected Red Globe	Feb. 4	1·0	2	16	16·5	1·0	435

Onions from Sets.—Onion sets are small onions which have been checked in growth and ripened prematurely the previous season. They are grown by seeding thickly so that the plants crowd each other and cannot develop properly. If they have developed beyond a certain point they will go to seed when planted. The smaller the bulb the less likely is this to happen. Prizetaker onion sets and Yellow Globe Danvers were grown at this Station in 1921 and planted May 11, 1922, with the results shown below. Sets from Ottawa and potato onion sets grown at Kentville were planted also. The rows were 33 feet long of each variety. The advantage of sets is that a supply of onions is obtainable for summer use. Sets the size of the little finger are most satisfactory.

ONIONS FROM SETS

Variety	Size of bulb planted	Ready for use	Number of bulbs	Yield marketable bulbs	Number plants seeded
				lb.	
Prizetaker, K	Very small	Aug. 15	102	6·5	3
Prizetaker, K	Small	Aug. 15	109	22·0	9
Prizetaker, K	Medium	Aug. 15	103	14·5	34
Yellow Globe Danvers, K	Medium	Aug. 10	87	12·0	50
Yellow, C.E.F	Small	Aug. 1	135	11·5	0
Red, C.E.F	Small	Aug. 1	125	10·5	12
Potato, K	Small	Aug. 25		25·4	4
Potato, K	Large	Aug. 25		15·1	59

SPINACH

The seed was sown May 11, the plants ready for use the middle of June, Bloomsdale is one of the earliest varieties and is generally the most satisfactory. The results were as follows:—

SPINACH—TEST OF VARIETIES

Variety	Weight of 12 heads June 20	Plants starting to seed June 20
	lbs.	
Bloomsdale	1·5	15 per cent
Thick leaved	1·5	5 per cent
Broad Flanders	1·2	5 per cent
Victoria	1·0	5 per cent

TURNIPS

The early turnips were seeded May 11 in rows 18 inches apart. The following notes were taken:—

TURNIPS—TEST OF VARIETIES

Variety	Ready for use	Remarks
Early Purple Milan	July 10	Best early variety.
Early Snowball	July 12	Second best variety
Red Top Strap-lead	July 15	Rather coarse variety.
Amber Globe	July 25	Good quality.
Golden Ball	July 25	Good quality.

RADISH

This crop was seeded on May 10 in rows one foot apart, and the plants thinned to one inch apart in the rows. The Scarlet Olive was the earliest, followed by French Breakfast. Because of root maggot the latter seedings were not satisfactory.

RADISH—TEST OF VARIETIES

Variety	First ready for use	Remarks
Scarlet Olive	June 6	Best early variety.
French Breakfast	June 8	Good early variety.
Scarlet White Tip	June 10	Best main crop.
White Icicle	June 15	Good later sort.

LEEKS

Leeks were started in the greenhouse on March 31 and were set to the open ground May 22. Like the onion, they prefer a rich soil. Unlike the onion, they do not form a bulb, but the leaves develop into a thickened neck at the base of the plant, and this, with gradual earthing up forms a long, compact, blanched growth that may develop to 16 inches long and 1½ inches in diameter. It is found that plants so earthed up will carry through the winter in good condition. The Broad London and International Prize are both good varieties.

PARSNIPS

Tests were made of four varieties of parsnips. These were seeded May 11 in rows 16½ feet long, the rows 1½ feet apart. The stand was not thick and the plants averaged 6 inches apart in the row. The crop was harvested early in November.

PARSNIPS—TEST OF VARIETIES

Variety	Marketable roots	Weight from 1 row, 16½ feet
		lb.
Dobbies Selected	26	30
Elcombes Giant	23	30
Guernsey Half-Long	21	24
Hollow Crown	23	20

BEANS

The tests with beans were made in duplicate rows 33 feet long. The product of snap beans was determined from one row and mature beans from the other. Anthracnose, or bean rust, developed abundantly after the first of August and rendered the crop almost useless for seed purposes. The seed was planted in rows 2½ feet apart, and 3 inches apart in the row. All varieties were seeded on May 25. The date when first ready for use and the yield are given in the following table.

BEANS—TEST OF VARIETIES

Variety	First ready for use	Yield of pods, one row, 33 ft.	Anthracnose per cent		Yield mature seed from 1 row, 33′
			July 28	Aug. 23	lbs.
Davis White Wax O	July 20	15·8	75	100	0·7
Davis White Wax McD	July 20	16·5	10	100	1·2
Wardwells Kidney Wax O	July 20	14·3	5	100	1·7
Wardwells Kidney Wax G	July 20	11·0	0	100	1·8
Round Pod Kidney Wax O	July 20	15·8	15	100	1·2
Round Pod Kidney Wax G	July 20	12·1	50	100	1·9
Masterpiece	July 22	18·5	5	15	4·0
Plentiful French	July 22	21·4	20	100	3·2
Pencil Pod Black Wax	July 22	8·8	90	100	0·7
Stringless Green Pod O	July 22	12·2	5	100	2·0
Giant Stringless Green Pod	July 22	18·7	10	100	2·0
Grenells Rustless Wax	July 22	15·7	15	85	1·1
Challenger Wax	July 22	6·4	90	100	0·6
Bountiful Green Pod	July 22	17·6	10	100	2·4
Stringless Green Pod B	July 22	14·6	5	100	1·8
Yellow Eye	July 24	20·0	0	0	2·7
Extra Early Red Valentine	July 25	13·2	5	100	1·0
Fordhook Favourite O	July 25	7·0	35	100	0·8
Fordhook Favourite B	July 25	11·1	15	100	1·7
Pilot	Aug. 2	25·0	0	0	3·6
Hodsons Long Pod	Aug. 3	20·7	0	25	0·8
Refugee or 1,000 to 1·0	Aug. 4	20·1	0	10	0·7
Refugee or 1,000 to 1 C	Aug. 4	20·6	5	45	2·2

Successional Sowings.—Seed of the Round Pod Kidney Wax was sown at different dates and a record kept of the production. These records show that it is better to plant a medium and a late maturing kind at the one planting than to make successional plantings. It will be noticed that weather conditions favoured the development of anthracnose, or bean rust, after August 1, the plants up to that time being quite free from this disease. The plantings made on June 8th and 15th were practically useless, because of this disease. These tests were conducted on duplicate rows 50 feet long. One row was allowed to ripen and the other was pulled for snap beans. The rows were 2½ feet apart and the seed was planted 2 inches apart in the row.

BEANS—SUCCESSIONAL SOWINGS

Variety	Sown	First ready for use	Yield Green pods, 1 row, 50 feet
			lb.
Round Pod Kidney Wax	May 25	July 20	33·2
Round Pod Kidney Wax	June 1	July 30	16·2
Round Pod Kidney Wax	June 8	Aug. 2	8·7
Round Pod Kidney Wax	June 15	Aug. 8	5·8
Extra Early Red Valentine	May 25	July 25	28·6
Stringless Green Pod	May 25	July 23	25·6
Refugee or 1,000 to 1	May 25	Aug. 6	29·6

BEANS—PERCENTAGE DISEASED

Variety	Sown	Anthracnose per cent pods diseased		Weight mature seed from 1 row, 50 feet
		July 28	Aug. 23	
				lb.
Round Pod Kidney Wax	May 25	15	100	2·4
Round Pod Kidney Wax	June 1	5	100	·8
Round Pod Kidney Wax	June 8	0	80	0
Round Pod Kidney Wax	June 15	0	68	0
Extra Early Red Valentine	June 25	0	100	2·8
Stringless Green Pod	June 25	20	96	3·6
Refugee or 1,000 to 1	June 25	0	48	2·8

Pole Beans.—These were seeded in rows 2½ feet apart. The seed was planted May 25. Poles were set 9 inches apart.

Variety	First ready for use	Remarks
Nonsuch	July 27	Scarlet Runner type.
White Czar	July 28	Kentucky Wonder type.
Prizewinner	July 30	Scarlet Runner type.
White Runner	Aug. 1	Kentucky Wonder type.
Asparagus	Aug. 5	Kentucky Wonder type.
Veitchs Climbing	Aug. 5	Semi-climbing type,
Chutes Special Wax	Aug. 20	Distinct type.
Kentucky Wonder Wax	Aug. 3	Kentucky Wonder type.
Early Wonder Green	Aug. 3	Same as Kentucky Wonder.

The Kentucky Wonder Wax, Early Wonder and Asparagus are the three best varieties under test. The Asparagus was practically free from anthracnose.

CUCUMBERS

These were grown in single rows spaced 8 feet apart. Manure was placed in a trench made by ploughing out two good furrows, and covered. The seed was scattered along the row and later thinned to nine plants to a plot 12 feet long, spacing the plants 15 inches apart. Seeding was done June 1, and the plants came on rapidly. The variety XXX Table was one of the best, followed by Improved Long Green and White Spine. The striped cucumber beetle appeared on June 8 and was controlled by frequent applications of a dust made up of 1 part arsenate of lime to 10 parts of hydrated lime. The yield from the plots was as stated below:—

CUCUMBERS—TEST OF VARIETIES

Variety	First ready for use	Yield from plot
		lb.
White Spine	Aug. 9	84·6
XXX Table	Aug. 10	81·6
Davis Perfect	Aug. 9	78·2
Improved Davis Perfect	Aug. 10	76·6
Improved Long Green	Aug. 9	74·0
Prize Pickling	Aug. 12	71·0
Prolific	Aug. 7	63·4
Early Russian	Aug. 8	63·0
Danish Pickling	Aug. 9	21·2

EGG PLANTS

The seed was sown in the greenhouse March 22, the plants set to shallow flats three inches apart in April, and planted in the field June 6. Black Beauty is unsatisfactory, as the fruit sets only sparingly. Improved New York Purple is two weeks earlier than the above, sets fruit well and is the most satisfactory of those tested.

CITRON

Seed of varieties of citron was planted June 2. Six plants of each were sown. The variety Colorada is the most satisfactory.

	Number of fruits.
Colorado 0-1-746	13
Red Seeded	6

PEPPERS

The seed was sown in the greenhouse March 22. The plants were transplanted to shallow boxes 3 inches apart and were set to the field June 6. The following notes were made of the growth of the crop:—

PEPPERS—TEST OF VARIETIES

Variety	When Mature	Production	Remarks
Harris Earliest 0-878	Early September	Good	The best variety.
Ruby King	Early September	Good	Large long fruit.
Crimson King	Early September	Good	Large fruit.
Long Red Cayenne	Middle September	Good	Long small fruit
Small Red Chili	Early October	Fair	Small fruit.
Golden Dawn	Late October	Poor	Did not set well.
Large Red Bullnose	Late October	Poor	Did not set well.
Chinese Giant	Late October		No fruit.

GARDEN CORN

The leading varieties of sweet corn were seeded May 25 in rows 3 feet apart, the plants later being thinned to 9 inches apart in the row. The variety Pickaninny, originated at Ottawa, was the first to mature. It has very small ears, but the quality is exceptionally good. Indian Sweet has small ears also. Early Malcolm, originated at Ottawa, is especially good for commercial planting. Sweet Squaw is another good variety, also originated at Ottawa. New Golden Giant is an excellent mid-season variety, equal to Golden Bantam. The results below are from rows 66 feet long.

GARDEN CORN—TEST OF VARIETIES

Variety	Ready for use	Height	Total Ears	Marketable Ears	Per Cent Ears Marketable
		feet			
Pickaninny 0.-3420-1395	Aug. 10	3			60
Indian Sweet	Aug. 20	3	73	52	71
Early Malcolm 0-846-58	Aug. 25	4½	93	78	83·8
Sweet Squaw, 0-1945-612	Aug. 30	4½	102	66	64·7
Early Mayflower	Aug. 30	4½	115	72	62·6
Early July	Aug. 30	3½	66	57	86·3
Golden Bantam	Sept. 1	4½	53	46	86·7
Whipples Yellow	Sept. 3	5½	104	82	79
Pocahontas	Sept. 4	5	88	63	71·4
Howling Mob	Sept. 4	5	97	83	85·5
Bishop Corn, Kentville	Sept. 4	5	75	62	82
Catawba	Sept. 5	5	71	63	88·7
Extra Early Cory	Sept. 5	5½	103	82	79·7
Early Fordhook	Sept. 5	5	105	79	75·2
New Golden Giant	Sept. 5	5½	72	52	72·2
Evergreen Bantam	Sept. 8	5½	78	43	53·8
Black Mexican	Sept. 8	5	87	67	77·
Metropolitan	Sept. 13	6½	56	27	48·
Country Gentleman	Sept. 30	5			
Stowells Evergreen	Sept. 30	6½			
Tom Thumb Popcorn	Aug. 15	2½			100·

TOMATOES

The seed of trial tests with tomatoes was sown March 31 in flats, and the seedlings later set to other shallow flats, spacing them 4 inches apart each way. These were set to the open ground, 4 feet apart each way, on May 31. Six plants were set of each variety. A frost on the 28th of September killed the plants, which at this time had considerable fruit still unripened. The yield of ripe fruit is given below:—

TOMATOES—TEST OF VARIETIES

Variety	First ripe fruit	Yield of Ripe Fruit from six Plants			
		To Aug. 18		Total yield	
		lb.	oz.	lb.	oz.
Langdons Earliana	Aug. 8	4	–	218	12
Prosperity	Aug. 10	3	4	211	14
Earlibell 0-1705	Aug. 15	3	6	202	2
Burbank Early 0-1717	Aug. 10	6	4	198	11
Sparks Earliana	Aug. 8	18	4	183	12
Alacrity 0-815-29	Aug. 6	7	10	166	6
Northern Adirondack	Aug. 4	7	4	159	10
Burbank Early	Aug. 8	6	4	140	2
Danish Export 0-186-73	Aug. 1	11	12	127	–
John Baer	Aug. 15	1	10	124	6
Red Head	Aug. 12	4	10	120	–
Perfection	Aug. 8	3	4	118	10
Bonny Best S	Aug. 18	–	8	116	2
Bonny Best C	Aug. 8	7	6	110	–
Chalkes Jewel	Aug. 15	2	–	97	6
Crimson Canner	Aug. 15	2	14	85	–
Matchless, G	Aug. 25	–	–	63	4
Matchless B	Aug. 28	–	–	41	13

Tomatoes Trained in Different Ways.—The object of this experiment is to find out whether there is any advantage in training tomato plants to single and double stems over allowing them to remain unsupported on the ground. Twelve plants of each of the two varieties were used in each test. Some plants were

tied to stakes, and others to three strands of wire fastened to stakes. A duplicate set of plots from which half the foliage was removed was compared with those in which all foliage was allowed to grow, only the laterals being removed. In training to single and double stems all laterals are removed. This represents considerable work and must be attended to once each week, the remaining stem or stems being tied to a support. In commercial tomato growing this is seldom practised. However, in garden work it very often pays in that earlier fruit can be had and less space is required.

The plants were uniform on all plots when planted. The trained plants were spaced in rows 4 feet apart and 2 feet apart in the rows, the twelve plants occupying 96 square feet of ground. The untrained plants were spaced 4 feet by 4 feet, six plants of these occupying the same area as twelve trained ones.

From the results tabulated below it will be seen that the total yield of ripe fruit was greater on the untrained plot than on the trained plots. On September 18 the ripe fruit on the trained plot with half the foliage removed was 14 pounds, 10 ounces more, and on the trained plot with no foliage removed 12 pounds more, than on the untrained plot. There does not appear to be any great advantage in removing the foliage, for although 2 pounds, 10 ounces more of early fruit was harvested from these plants the total yield of ripe fruit was 10 pounds less. The results are set forth in more detail in the table below:—

TOMATOES TRAINED IN DIFFERENT WAYS

No Foliage Removed

Variety	How Trained	Yield of Ripe Fruit from 12 Plants			
		Yield to Sept. 18		Total yield	
		lb.	oz.	lb.	oz.
Alacrity	Single stem to stake	16	10	92	4
Bonny Best	Single stem to stake	14	..	101	..
Average		15	5	96	10
Alacrity	Double stem to stake	17	3	143	
Bonny Best	Double stem to stake	11	8	139	6
Average		14	5·5	141	3
Alacrity	Single stem to wire	26	6	93	
Bonny Best	Single stem to wire	20	..	95	14
Average		23	3	94	7
Alacrity	Double stem to wire	34	6	119	8
Bonny Best	Double stem to wire	16	2	100	4
Average		25	4	109	14
Alacrity	Single stem to stake	18	12	97	4
Bonny Best	Single stem to stake	16	4	85	14
Average		17	8	91	9
Alacrity	Double stem to stake	24	2	136	..
Bonny Best	Double stem to stake	14	10	112	12
Average		19	6	124	6
Alacrity	Single stem to wire	26	4	74	12
Bonny Best	Single stem to wire	27	6	92	6
Average		26	13	83	9
Alacrity	Double stem to wire	29	6	92	..
Bonny Best	Double stem to wire	20	8	113	8
Average		24	15	102	12

Bush Grown

Variety	Yield from 6 plants			
	Yield to Sept. 18		Total yield	
	lb.	oz.	lb.	oz.
Alacrity	7	10	116	6
Bonny Best	7	6	116	2
Average	7	8	116	4

SUMMARY

—	Ripe fruit to Sept. 18		Total ripe fruit harvested	
	lb.	oz.	lb.	oz.
No foliage removed—				
Single stem to stakes	15	5	96	10
Single stem to wires	23	3	94	7
Double stem to stakes	14	5½	141	..
Double stem to wires	25	4	109	14
Average	19	8	110	8

—	Ripe fruit to Sept. 18		Total ripe fruit harvested	
	lb.	oz.	lb.	oz.
Half of foliage removed—				
Single stem to stakes	17	8	91	9
Single stem to wires	26	13	83	9
Double stem to stakes	19	6	124	6
Double stem to wires	24	15	102	12
Average	22	2	100	9
Bush Plants—				
Average	7	8	116	4

POTATOES, TEST OF VARIETIES, 1922

The land on which these potatoes were grown was in corn in 1921. Ten tons of manure per acre was applied in the spring of 1922, and ploughed under. The land was then thoroughly disced and worked with cultivators. A fertilizer made by mixing 300 pounds of acid phosphate with 100 pounds of muriate of potash was then distributed over the whole area at the rate of 600 pounds per acre, and well worked into the soil. The potatoes were planted May 18. They were sprayed four times with Bordeaux mixture. There was no evidence of blight. The season was extremely wet and, as the area on which these potatoes were grown had poor drainage, the excessive amount of moisture resulted in some loss from rot. The yields as a whole were light, although in five tests of Green Mountain from certified seed, an average of 288·6 bushels per acre was obtained.

POTATOES, TEST OF VARIETIES, 1922

Plots 132 ft. by 2½ ft., (1-132 acre)

K.—Kentville.
F.—Fredericton.

Name of Variety	Yield per acre marketable	Yield per acre unmarketable	Total yield per acre
	bush.	bush.	bush.
Green, Mountain, K.	302·5	23·1	325·6
Green Mountain, K.	275·0	24·2	299·2
Dakota Red	265·1	22·0	287·1
Piermont Seedling, F.	248·6	38·5	287·1
Green Mountain, F.	258·5	27·5	286·0
Green Mountain, K.	250·8	34·1	284·9
Green Mountain, K.	258·5	20·9	279·4
Wee McGregor	259·6	18·7	278·3
Cobbler-Fawcett, 1917	238·7	30·8	269·5
Comet	245·3	18·7	264·0
Rural New Yorker, F.	247·5	15·95	263·45
Vicks	242·0	17·5	259·5
Cobbler—B. McK.	223·3	31·9	255·2
Vicks	237·6	17·6	255·2
Green Mountain, K.	233·2	20·9	254·1
New Chieftain, F.	235·4	16·5	251·9
Cobbler—A. J. J.	211·2	40·7	251·9
Acquisition	217·8	30·8	248·6
Mills Pride—Rh.	221·1	26·4	247·5
Clyde	225·5	21·45	246·95
Cobbler—Fawcett, 1916	209·0	31·9	240·9
Cobbler—Nappan	206·8	34·1	240·9
Sir Walter Raleigh	223·3	16·5	239·8
Early Nebraska, F.	225·5	13·75	239·25
Eureka Extra Early, F.	199·1	39·6	238·7
Cobbler—Dr. McI.	203·5	33·0	236·5
Cobbler—C. C.	187·0	46·2	233·2
Dreer's Standard, F.	215·6	15·95	231·55
Cobbler—A. M.	204·6	26·4	231·0
Reeves Rose, F.	209·0	20·9	229·9
Sir Walter Raleigh, F.	207·9	19·8	227·7
Ensign	207·9	18·7	226·6
Long Green Mountain—W.	207·9	17·5	225·4
Todd Wonder	204·6	20·35	224·95
Carman No. 1—F.	200·2	23·1	223·3
American Wonder, F.	200·75	23·1	223·85
Pioneer	195·8	26·1	221·9
Comet	202·4	18·7	221·1
Seedling 5727, F.	193·6	25·85	219·45
Green Mountain—J. H. J.	194·7	19·25	213·95
Carman No. 3, F.	194·7	16·5	211·2
Delaware—C. P. B.	177·1	32·45	209·55
Early Six weeks	180·95	27·5	208·45
King Edward VII	168·3	36·3	204·6
McIntyre	182·6	20·9	203·5
Empire State—T. W. C.	187·0	15·4	202·4
Cobbler—A. J. J.	172·7	24·2	196·9
White Rose, C. P. B.	177·1	18·7	195·8
Cobbler, G.	167·2	27·5	194·7
Green Mountain—Faw. 1917	168·3	22·0	190·3
Cobbler, P.	168·3	18·7	187·0
Pan American	170·5	16·5	187·0
Early Rose	168·3	14·3	182·6
Table Talk, F.	149·6	30·8	180·4
Money Maker, F.	162·8	16·5	179·3
Manistee	151·8	25·8	177·6
Early Ohio	157·6	19·8	177·4
Vermont Gold Coin	151·8	25·3	177·1
King George 0 923	130·9	45·1	176·0
Maggie Murphy	154·0	18·7	172·7
Whitney No. 1—F.	144·1	27·5	171·6
Rural New Yorker	148·5	19·8	168·3
New Queen	144·1	23·1	167·2
Prince Albert	136·4	25·3	161·7
Rawlings	135·3	25·3	160·6
Speedwell	137·5	19·8	157·3

POTATOES, TEST OF VARIETIES, 1922—*Concluded*

K.—Kentville.
F.—Fredericton.

Name of Variety	Yield per acre marketable	Yield per acre unmarketable	Total yield per acre
	bush.	bush.	bush.
Hustler	129·8	26·4	156·2
Vermont Gold Coin, F	135·3	18·7	154·0
Farmer, R	139·7	14·3	154·0
Black Cape Breton	129·8	23·1	152·9
Bliss Triumph	124·3	28·4	152·7
Scottish Triumph	128·7	20·9	149·6
New Scotch Rose	127·6	17·5	145·1
Bliss Triumph	111·1	30·8	141·9
Great Scott, 0918	102·3	38·5	140·8
Green Mountain, E. McF	118·8	20·9	139·7
Scott	105·6	31·9	137·5
Kerrs Pink, 0916-17	111·1	20·9	132·0
Early Buckeye, G	108·9	20·9	129·8
Delaware, F	108·7	17·5	126·2
Early Ohio	105·03	20·9	125·93
Edzel Blue, 0919	86·9	34·6	121·5
Morgan Seedling	99·0	22·0	121·0
Majestic, 0915	92·4	25·85	118·25
Seedling, F. H	84·7	34·1	118·8
White Albino	92·4	18·7	111·1
Longworthy, F	96·8	12·6	109·4
Bovee	91·3	18·15	109·45
Seedling, 13660 F	75·9	27·5	103·4
Factor	89·1	13·75	102·85
Early May, F	80·3	19·8	100·1
Early Rose	77·0	18·7	95·7
Gold Coin, C. P. B.	72·6	20·9	93·5
McCullough	70·4	18·7	89·1
Early Hebron	70·4	17·6	88·0
Barnhouse Beauty	27·5	20·9	48·4

VARIETY TEST OF POTATOES, 1922

(Six English Varieties Planted Here for the First Time in 1921)

Name	Yield per acre marketable	Yield per acre unmarketable	Total yield per acre
	bush.	bush.	bush.
Kerr Pink 916-17	111·1	20·9	132·0
King George 923	130·9	45·1	176·0
Edzell Blue 19	86·9	34·6	121·5
Great Scott 918	102·3	38·5	140·8
Majestic 915	92·4	25·85	118·25
Barnhouse Beauty 922	27·5	20·9	48·4

AVERAGE YIELD PER ACRE OF SOME OF THE BEST YIELDING POTATOES AT KENTVILLE

(Test Covering Several Years)

Name	Yield per acre marketable	Yield per acre unmarketable	Total yield per acre
	bush.	bush.	bush.
Green Mountain	270·6	27·6	298·2
Irish Cobbler	232·8	31·0	263·8
Comet	237·1	18·1	255·2
Acquisition	208·0	31·4	239·4
Sir Walter Raleigh	215·0	18·16	233·16
Todd Wonder	212·1	17·5	229·6
Empire State	202·5	17·9	220·4
Early Rose	201·9	17·2	219·1
Manistee	191·15	21·2	212·7
Farmer	183·4	15·9	199·3

POTATOES CUT IN DIFFERENT WAYS FOR PLANTING

A test was again conducted this year to determine the best way of cutting the potato for planting.

This work has been carried on for a number of years and the average results for six years were published in the report of this Station for 1921.

The varieties used this year were Green Mountain, Manistee and Davies Warrior. The Green Mountain was certified seed grown here in 1921; Manistee and Davies Warrior were not certified. It will be noticed that the yields of Green Mountain in all the ten tests this year were much greater than those from either of the other varieties used.

Green Mountain, average ten tests..... 488·6 bushels
Manistee, average ten tests..... 312·1 bushels
Davies Warrior, average ten tests..... 305·6 bushels.

POTATOES CUT IN DIFFERENT WAYS FOR PLANTING, 1922

Variety and how cut	Seed used per acre	Yield per acre marketable	Yield per acre unmarketable	Total yield per acre
	Bush.	Bush.	Bush.	Bush.
Green Mountain				
One eye, small piece	6·05	547·8	15·4	563·2
One eye, large piece	26·4	565·4	37·4	602·8
Two eyes, small piece	9·35	455·4	11·0	466·4
Two eyes, large piece	26·4	479·6	52·8	532·4
Three eyes	19·5	360·8	28·6	389·4
Whole	50·05	561·0	44·0	605·0
Seed end	24·75	420·2	55·0	475·2
Stem end	20·8	413·6	22·0	435·6
Lengthwise	29·7	442·2	39·6	481·8
Ordinary	22·0	305·8	28·6	334·4
Manistee				
One eye, small piece	10·1	270·6	11·0	281·6
One eye, large piece	24·75	294·8	26·4	321·2
Two eyes, small piece	29·4	347·6	17·6	365·2
Two eyes, large piece	27·5	286·0	15·4	301·4
Three eyes	23·65	268·4	13·2	281·6
Whole	35·2	349·8	44·0	393·8
Seed end	25·02	301·4	24·2	325·6
Stem end	27·7	246·4	11·0	257·4
Lengthwise	22·8	303·6	37·4	341·0
Ordinary	21·5	222·2	30·8	253·0
Davies Warrior				
One eye, small piece	11·8	187·0	19·8	206·8
One eye, large piece	25·3	363·0	19·8	382·8
Two eyes, small piece	11·8	371·8	19·8	391·6
Two eyes, large piece	29·9	312·4	15·4	327·8
Three eyes	17·6	336·6	24·2	360·8
Whole	48·4	371·8	46·2	418·0
Seed end	22·5	332·2	24·2	356·4
Stem end	27·2	275·0	15·4	290·4
Lengthwise	24·7	160·6	24·2	184·8
Ordinary	22·0	116·6	24·2	140·8

POTATO SCAB CONTROL

The experiment to determine the value of common sulphur, bacterized sulphur and gypsum for the control of the potato scab organism in the soil was conducted on land that, in certain areas, had been limed with 7,500 pounds of limestone in 1916, in other areas, with this quantity in 1916 and again in 1918, and on other areas that had received no lime. These areas had previously been used to determine the value of lime in overcoming the club-root organism.

The Green Mountain variety of potatoes was used and the tubers planted were free from scab. The areas were one-fortieth acre each. Bacterized sulphur at the rate of 400 and 800 pounds per acre was used on some of the twice-limed (1916 and 1918) plots. Common superfine dusting sulphur at the rate of 400 and 800 pounds per acre was used on the plots limed in 1916, on the plots that had not been limed, and, at the rate of 800 pounds per acre only, on some of the twice-limed plots.

Gypsum at the rate of 800 pounds per acre was used on the three areas. Duplicate areas adjoining each plot were left untreated. The tubers were examined individually and sorted into four divisions, and the percentage of bad, medium, slightly diseased and disease-free tubers determined.

The tabulated results as given below would seem to indicate little, if any, gain from the use of these materials for suppressing or killing this organism in the soil of these plots.

Control Measures Used	Scab, Per Cent, Treated Area					Scab, Per Cent, Untreated Area.				
	Bad	Medium	Slight	Total scab	Free	Bad	Medium	Slight	Total scab	Free
Area Limed 1916										
Gypsum, 800 lbs. per acre	36·81	22·07	37·69	96·57	3·43	20·63	20·16	32·11	72·90	27·10
Common Sulphur, 800 lbs. per acre	5·11	6·77	20·69	32·57	67·43	13·1	19·98	30·63	63·71	36·29
Common Sulphur, 400 lbs. per acre	24·42	19·84	30·81	75·07	24·93	11·13	14·52	35·22	60·87	39·13
Area Limed, 1916 and 1918										
Gypsum, 800 lbs. per acre	75·17	17·87	6·89	99·93	0·17	48·11	24·39	24·97	97·47	2·53
Common Sulphur, 800 lbs. per acre	38·39	24·29	31·15	93·93	6·17	62·32	23·42	13·54	99·28	0·72
Bacterized Sulphur, 800 lbs. per acre	30·22	22·8	41·70	94·72	5·28	13·75	25·38	45·18	84·31	15·69
Bacterized Sulphur, 800 lbs. per acre	55·41	21·81	17·81	95·03	4·97	23·97	31·68	35·68	91·33	8·67
Area Not Limed										
Gypsum, 800 lbs. per acre	0·0	18·18	30·91	49·09	50·91	0·0	1·0	13·0	15·0	86·0
Common Sulphur, 800 lbs. per acre	0·0	0·0	0·0	.....	100·0	0·0	0·0	5·41	5·41	94·59
Common Sulphur, 400 lbs. per acre	1·04	0·0	2·08	3·12	96·88	0·0	1·09	0·0	1·09	98·91

SHRUBS

The shrubs planted at this Station have made sufficient growth to enable information to be given as to those most desirable for ornamental planting. Some of the more valuable ones are given below, with notes as to period of bloom, approximate height ultimately attained, desirability, etc. In case it is necessary to confine the planting to one of a species, the one first given in the list is likely to give the best satisfaction. It should be remembered that, with favourable soil, the growth may exceed that given, and that to crowd the plants may force a more upright growth than if more space is allowed. As a rule, shrubs are most effective when grown in groups of three or five of a variety or species, spacing the plants five to eight feet apart. It is wise to confine the planting of groups to a few species, rather than to single plants of a great number of species. It is advisable to place the groups along the edge of the lawn for best effect, leaving considerable lawn comparatively unbroken.

Golden Bell (*Forsythia intermedia*).—Bloom middle to last of May. Height 5 to 6 feet. This is the first shrub to bloom, and the striking yellow blossoms in the early spring before the leaves appear make it exceedingly desirable.

Golden Bell *(Forsythia viridissima)*.—Period of bloom same as above. Height 6 to 7 feet.

Weeping Golden Bell *(Forsythia suspensa)*.—Period of bloom same as above. Height 4 to 5 feet. Of rather reclining habit.

Yellow-flowering Currant *(Ribes aureum)*.—Bloom 20th to 30th May. Height 5 to 6 feet. The clove scented perfume is very pleasing.

Dwarf Bridal Wreath Spirea *(Spiræa arguta)*.—Bloom during early half of June. Height 3 to 4 feet. For a small growing spirea this is one of the best, being a very free bloomer.

Bridal Wreath Spirea *(Spiræa Van Houttei)*.—Bloom middle to last of June. Height 6 to 7 feet. This is probably more largely planted than any other of the spireas.

Double-flowered Spirea *(Spiræa prunifolia flore pleno)*.—Bloom middle to last of June. Height 4 to 5 feet.

Sorbus-leaved Spirea *(Spiræa sorbifolia)*.—Bloom July 10 to 20. Height 2 to 3 feet.

Golden Spirea *(Spiræa opulifolia aurea)*.—Bloom early in July. Height 5 to 6 feet. If a shrub with yellow foliage is required this is very desirable.

Dwarf Late-flowering Japanese Spirea *(Spiræa japonica Bumalda)*.—The variety Anthony Waterer is the best. Height 2 feet. Bloom early in August.

Tartarian Bush Honeysuckle *(Lonicera tatarica speciosa)*.—Bloom middle to last of June. Large Pink blossoms. Height 6 to 8 feet. The variety *rosea*, with rose-coloured flowers, is very desirable. It is decidedly attractive when in bloom and the red, double berries in the fall have a pleasing appearance.

Japanese Honeysuckle *(Lonicera Morrowii)*.—Height 4 to 5 feet. Very pleasing in habit of growth. Bloom the last week in June. Flowers yellowish-white. Effective for low-growing group planting.

Snowberry *(Symphoricarpus racemosus)*.—Height 5 to 6 feet. Unattractive bloom about the middle of July. The snow-white wax-like berries are very attractive in the fall.

Woody Caragana *(Caragana frutescens)*.—Bloom second and third week in June. Height 6 to 8 feet. The yellow blossom is attractive and the later development of pods is pleasing. Very desirable for group or screen planting.

Dwarf Caragana *(Caragana pygmæa)*.—Bloom same time as above, flowers a deep yellow. Height 1½ to 2½ feet. A very desirable dwarf, bushy form.

Siberian Pea Tree *(Caragana arborescens)*.—Bloom same periods as the above. Height 8 to 10 feet. This is a larger variety of Caragana than either of the above, and assumes more of a tree form.

Japanese Caragana *(Caragana Chamlagu)*.—Bloom same time as above. Height 5 to 6 feet.

Lilac *(Syringa vulgaris)*.—In bloom from the middle to the last of June. There are many named varieties. Madame Abel Chatenay is one of the best white ones, flowers double. Marie Legraye, with single, slightly cream-coloured flowers, is also fine; the trusses of bloom are smaller than the above. Madame Casimir-Perier is also a fine, large, double white, with graceful panicles. Charles X, single flowered, dark lilac-red, is very desirable. Charles Joly is one of the darkest, with purplish-red double flowers in large panicles, and should be included as one of the best. President Carnot, a double pale blue, is also very fine. Michel Buchner, large double flowers of pale lilac, is desirable.

Syringa villosa and *Syringa Josikœa* should be included in the collection, being later in bloom, coming in early in July.

Japanese Lilac *(Syringa Japonica)*.—Bloom July 10 to 20. Very large, yellowish-white panicles, most attractive. This lilac will in time grow to a small tree, twelve to fifteen feet high.

Snowball Tree *(Viburnum opulus sterile)*.—Bloom early part of July Height 4 to 5 feet.

High-bush Cranberry, or Wild Guelder Rose *(Viburnum americanum)*.—Bloom early in July. The clusters of scarlet fruit are attractive in the fall, and remain on the branches throughout the winter.

Wayfaring Tree *(Viburnum Lantana)*.—Bloom middle of July. Height 10 to 12 feet.

Mock Orange. Syringa *(Philadelphus coronarius)*.—Bloom second week in July. Height 6 to 8 feet. Philadelphus satsumi is one of the best varieties with large, fragrant, white to slightly cream-coloured flowers.

Large-flowered Syringa *(Philadelphus grandiflorus)*.—In bloom a week later than the above. Very upright in growth and less spreading in habit than the above.

Hybrid Syringa *(Philadelphus Lemoinei)*.—Of dwarfer habit of growth generally. In bloom early in July. Has a delicate and delightful perfume. There are many varieties, such as Manteau d'Hermine and Boule d'Argent. There are a number of very dwarf varieties in this class also.

Golden Elder *(Sambucus nigra var. aurea)*.—Bloom about the middle of July. Height 8 to 10 feet. This is useful principally because of its golden foliage.

Cut-leaved Elder *(Sambucus nigra var. laciniata)*, and Scarlet-berried Elder *(Sambucus racemosus)* are useful in group planting.

Japanese Barberry *(Berberis Thunbergii)*.—Height 3 to 4 feet. A very compact yet graceful shrub. The clusters of red berries during the fall and winter are particularly pleasing.

Japanese Quince *(Cydonia japonica)*.—Bloom early in June. Height 2 to 3 feet. Very striking scarlet bloom in the early spring.

Smoke Bush *(Rhus cotinus atropurpurea)*.—The feathery bloom, giving the appearance of ascending smoke, is decidedly attractive during the month of August.

Red-leaved Rose (*Rosa rubrifolia*).—A red-leaved form of Sweetbriar particularly suitable for group planting where coloured foliage is desired.

Japanese Rose (*Rosa rugosa*).—Bloom first half of July. Height 5 feet. This is a vigorous growing large, single-flowered rose suitable for group planting. The large bright red haws are very attractive in the fall. Rosa rugosa alba is a white single-flowered variety and Rosa rugosa flore pleno, a semi-double form.

Rose Acacia *(Robinia hispida)*.—Height 3 to 4 feet. Rose-coloured bloom during the early half of July is attractive. This shrub spreads rapidly by suckers.

Japanese Hydrangea (*Hydrangea paniculata grandiflora*).—Bloom during the latter part of August and early September.

Hydrangea arborescens grandiflora.—Bloom the latter part of July. Bloom similar to the Snowball in appearance. Height 3 feet.

Shrubby Cinquefoil (*Potentilla fruticosa*).—Medium sized yellow blossom, July and August. Height 3 feet.

Weigela rosea *(Diervilla florida)*.—Bloom early in July. Height 4 to 5 feet.

Weigela Eva Rathke (*Diervilla hybrida* Eva Rathke.)—This with its red bloom is one of the best of the weigelas. There are a number of other very fine named hybrids.

Pearl Bush (*Exochorda grandiflora*).—Bloom second week in July. Height 4 to 5 feet.

Deutzia crenata plena.—Bloom middle of July. Height 2½ feet. Beautiful panicles of double white flowers tinged with red on the outside. Pride of Rochester is one of the best varieties.

Deutzia crenata candidissima plena, with double pure white flowers, is good. Bloom middle of July. Height 2½ feet.

Deutzia gracilis, with white bloom, is very dwarf, and not so hardy as the above.

Deutzia Lemoinei, with white flowers, is similar to the above, but hardier and not so dwarf.

Red branched Dogwood (*Cornus alba sibirica*).—Height 3 to 4 feet. This is useful principally because of the attractive bright red bark during the winter and early spring.

EVERGREENS

White Cedar, Arborvitae (*Thuya occidentalis*).—There are many pleasing forms of this cedar, some of which are quite dwarf. Some of the most desirable are Compact Arborvitae (*Thuya occidentalis compacta*), Globose Arborvitae (*Thuya occidentalis globosa*), Ware's Arborvitae (*Thuya occidentalis Wareana*), Pyramidal Arborvitae (*Thuya occidentalis pyramidalis*), and Ellwanger's Arborvitae (*Thuya occidentalis Ellwangerina*).

Three-leaved Retinospora (*Cupressus pisifera filifera*).—This is one of the most satisfactory of the retinospora group of evergreens.

The Plumose Retinospora (*Cupressus pisifera plumosa*) is also satisfactory. The golden form of this retinospora is much liked by many.

The Common Savin Juniper (*Juniperus Sabina*) is the most satisfactory of the junipers tested. It is dwarf in habit, and very spreading.

The Dwarf Mountain Pine (*Pinus montana Mughus*) is spreading in habit and 5 to 6 feet tall.

PAEONIA

None of the perennial flowering plants is more satisfactory than the paeony. There are a great number of varieties offered, choice of which will necessarily vary according to the fancy of the individual making the selection. From a number of the leading sorts under test we feel we can advise those listed below as likely to prove as desirable as any. By selecting early and late blooming varieties the season may be extended from the first to the third week of July. The paeony is propagated by division of the roots. This is done most successfully in the early autumn. The plants should be set with the crown two inches below the surface, and at least three feet apart. It is wise to give some attention to the preparation of the soil, working it deep and mixing into it a good supply of well rotted stable manure. In the fall a dressing of light manure should be placed around the plant to give winter protection.

White Varieties.—Festiva Maxima is the best early white. Duchess de Nemours, a few days later, is also a fine white variety. Marie Lemoine comes on ten days later than Festiva Maxima, and is one of the best late white sorts. Couronne d'Or, three days later than Marie Lemoine, is the best very late white.

Pink Varieties.—Marie Crousse comes into bloom four days after Festiva Maxima and is one of the finest pinks. Triomphe de l'Exposition de Lille, in bloom at the same time as the above, is also very fine. Marquis d'Ivry is a very fine late pink, in bloom eight days later than Marie Crousse.

Deep Pink Varieties.—Edulis Superba is in bloom a few days after Festiva Maxima, followed by Modele de Perfection a few days later, and, a week later by Livingstone and Rubra Superba.

Red Varieties.—Henri Demay is in bloom three days after Festiva Maxima, and is a good red. Felix Crousse, three days later, a brilliant light red, is the finest of the red varieties.

CEREAL HUSBANDRY

The early part of the season was a favourable one for all cereal crops. The latter part, however, was very wet, and, on some areas, the grain crops lodged considerably. The harvesting weather was also unfavourable. The cereal crops grown at this station include three varieties each of oats, wheat and barley, one of spring rye and two of peas. The yield of wheat was very light, the kernels not having filled as well as usual. The yield of peas was also light.

The area in each crop except Chinese Ottawa No. 60 barley and Mackay peas, which were one-twentieth acre each, was one-half acre. The land on which these varieties were grown was in potatoes in 1921. The ground was fall ploughed, and spring worked with the disc harrow before seeding. No fertilizer was used. The seeding was done on May 8, 9 and 13. The yields per acre were as given in the following table:—

Variety	When sown	When ripe	Number of days maturing	Height	Length of head	Yield per acre	Yield per acre	Straw per acre
				inches	inches	lbs.	bush.	tons
Oats								
Victory	May 13	Aug. 19	98	44	8	2,222·0	65·3	1·5
Banner Ottawa 49	May 13	Aug. 19	98	44	8	2,052·0	60·1	1·3
Hulless Oats								
Liberty Ottawa 480	May 9	Aug. 11	95	38	6 to 7	1,481·0	43·6	1·3
Barley								
Chinese, Ottawa No. 50	May 9	Aug. 12	95	40	2½ to 3	1,150·0	31·4	0·89
Charlottetown, No. 80	May 9	Aug. 12	95	37	3¼ to 3¾	2,171·0	45·2	1·4
Duckbill, Ottawa 57	May 9	Aug. 16	99	40	3 to 3½	1,482·0	30·8	.....
Rye								
O. A. C. No. 61	May 9	Aug. 23	106	54	3 to 4	553	9·9	0·87
Wheat								
Marquis, Ottawa 15	May 8	Aug. 16	100	40	3	947·6	15·8	1·15
Huron, Ottawa 3	May 8	Aug. 18	102	42	3½	940·7	15·6	1·1
Red Fife, Ottawa 17	May 8	Aug. 22	106	44	3½	798·1	13·3	0·77
Peas								
Arthur, Ottawa 18	May 19	Sept. 8	112	.....	.....	648·0	10·8	2·52
McKay	May 19	Sept. 8	112	.....	.....	728·0	12·1	3·01

AVERAGE YIELDS OF CEREAL CROPS

Variety	Average number of days maturing	Number of tests	Yield per acre	Yield per acre
			lbs.	bush.
Oats				
Victory	98	8	2,192	64·4
Banner, Ottawa 49	98	7	2,083	61·3
Hulless Oats				
Liberty, Ottawa 480	92	5	1,514	44·5
Barley				
Charlottetown, No. 80	94	7	1,891	39·4
Duckbill, Ottawa 57	96	4	1,439	29·9
Chinese Ottawa No. 60	95	1	1,510	31·4
Wheat				
Huron, Ottawa 3	100	5	1,191	19·9
Red Fife, Ottawa 17	104	9	955	15·9
Marquis, Ottawa 15	101	9	1,116	18·6
Rye				
O.A.C. No. 61	102	4	1,143	20·4
Peas				
Arthur	110	7	648	10·8
McKay	110	1	728	12·1

SEED TREATMENT OF GRAIN FOR SMUT CONTROL

The varieties of grain used were Huron wheat, No. 80 barley, Liberty (hulless) oats, and Irish King oats. The last variety was obtained from a farmer and was known to be from a field having much smut on it the previous season. The other varieties were grown at this Station. These were treated on the date of seeding, June 10. The methods of application were as stated in the table below. Through error, plot No. 2 was sprinkled with formalin and water in equal parts as used for plot 3 and none of the seed germinated.

The area was uniform and a good seed bed and ample moisture was obtained. The plots were one-twentieth acre each. The grain was sown with a seed drill. The stand was good throughout and so far as could be determined the germination on all plots was the same as from the control plot.

Samples were taken from the centre of each plot and the diseased and healthy heads counted, with the results as tabulated. The plots were threshed and the yields per acre as given obtained.

Plot	Treatment	Grain	Number of heads counted	Number of heads smut	Per cent smut	Yield per acre
						bush.
1	Copper Sulphate, Crystal 1 lb., Salt 1 lb., Water 5 gals., Soak ten minutes; then soak ten minutes in lime bath. (Quicklime 1 lb., Water 10 gallons).	Huron wheat....	835	60	6·69	13·0
		No. 80 barley...	765	23	2·91	26·25
		Liberty oats....	1,000	7	0·7	26·76
		Irish King oats..	902	50	5·25	30·0
3	Formaldehyde Spray.....	Liberty oats....	1,080	5	0·46	24·1
		Irish King oats..	1,000	0	0·0	40·88
4	Copper Carbonate Dust (20 per cent) metallic copper), 2 to 3 oz. to bush. of grain.....	Huron wheat....	759	49	6·46	10·16
		No. 80 barley...	797	27	3·38	24·37
		Liberty oats....	636	6	0·94	27·06
		Irish King oats..	856	56	6·54	37·94
5	Copper Sulphate dust (Dehydrated) Copper Sulphate 50 per cent, Hydrated Lime 50 per cent.	Huron wheat....	826	51	6·17	11·5
		No. 80 barley...	984	25	2·54	25·42
		Liberty oats....	684	26	3·7	26·47
		Irish King oats.	958	173	18·06	36·47
6	Check. No treatment.....	Huron wheat....	983	78	7·92	13·16
		No. 80 barley...	1,036	45	4·34	24·37
		Liberty oats....	959	409	41·6	17·06
		Irish King oats.	915	180	19·56	32·95
7	Nickel Carbonate Dust.....	Huron wheat....	752	59	7·85	13·6
		No. 80 barley...	644	20	3·1	23·33
		Liberty oats....	1,220	20	1·64	24·7
		Irish King oats.	705	39	5·53	36·47
9	San-O-San.....	Liberty oats....	2,352	899	38·22	
		Irish King oats.	826	227	27·48	35·30
10	Cholorophal.....	Liberty Oats....	2,557	740	28·94	
		Irish King oats.	965	132	13·68	32·94

FORAGE PLANTS

THE SEASON

All snow had disappeared by the last week in March. During the early part of April small clover plants which, because of the dry summer previous, had not made strong growth, were thrown out of the ground by repeated freezing and thawing. The red clover and sweet clover particularly suffered, while with alfalfa there was little loss in this particular. The months of April, May and June had less than normal precipitation, the total being 6·45 inches, while the average for the same period during the preceding eight years was 7·98 inches. This made it possible to finish seeding in good time under good conditions for work. The hay crop was checked by the dry weather during this period. The precipitation during July and August was much above normal, being 11·19 inches, while that of the previous eight years for this period was only 5·28 inches. This hampered haying and harvesting operations very greatly. The balance of the season was fairly normal.

CORN FOR ENSILAGE

Thirteen varieties of corn were grown on land which had been used for testing different grasses for forage purposes. The land was manured in the fall of 1921 at the rate of 15 tons per acre, ploughed and well worked in the spring of 1922 and fertilized at the rate of 600 pounds per acre with a mixture made up of 300 pounds acid phosphate, 200 pounds nitrate of soda, and 100 pounds muriate of potash. The corn was seeded in rows 3½ feet apart. The plots were one-twentieth acre each.

Three varieties, Wisconsin No. 7, Golden Glow and Longfellow, were seeded nine days later on land which had been in timothy and clover in 1921. The

plots were one-quarter acre each. This land was treated in the same way as that in which the other test was made, but because of being on a clover sod in good fertility, the yield was much greater than from the other varieties, although the seeding was later.

CORN FOR ENSILAGE—TEST OF VARIETIES

Seeded May 20, Cut September 28

Variety	Source of seed	Height when cut	State of ear when cut	Yield per acre
		feet		tons
Twitchell's Pride	E. F. Fredericton	6·0	Glazed	5·434
Quebec No. 28		6·5	Glazed	6·41
North Dakota	Steele Briggs	8·0	Late milk	9·24
White Cap Yellow Dent	Steele Briggs	8·5	Early milk.	9·36
Longfellow	J. O. Duke	8·5	Early milk.	9·515
Wisconsin No. 7	J. O. Duke	8·5	Early milk.	9·515
Leaming	John Parks	8·0	Early milk.	10·45
Compton's Early	J. O. Duke	8·5	Early milk.	10·615
Bailey	J. O. Duke	9·0	Early milk.	10·813
Improved Leaming	K. MacDonald Sons	9·0	Late milk	12·1
Golden Glow	J. O. Duke	9·0	Early milk.	12·122
Wisconsin No. 7	John Parks	9·0	Early milk.	12·705
Golden Glow	Lamont & Steadman	9·0	Early milk.	13·53
(Seeded May 29)				
Longfellow		8·5	Late milk	17·4
Golden Glow		9·0	Early milk.	18·1
Wisconsin No. 7		8·5	Early milk.	21·6

SUNFLOWERS FOR ENSILAGE

Three lots of Mammoth Russian sunflower seed from different sources and also three earlier-maturing varieties were seeded in one-twentieth-acre plots on May 13. The product was cut for silage when the heads were in full bloom and before the seed had started to harden. It would seem from the tests so far made that the Mammoth Russian variety is the one most desirable for this locality.

SUNFLOWERS FOR ENSILAGE—TEST OF VARIETIES

Variety	Source of Seed	Date of harvesting	Height when cut	Yield per acre
			feet	tons
Mammoth Russian	Dakota Imperial Seed Co	Sept. 15	12·0	20·8
Mammoth Russian	McDonald Seed Co	Sept. 15	12·0	20·9
Mammoth Russian	Halifax Seed Co	Sept. 15	12·0	22·3
Mixed Mennonite	Rosthern District	Aug. 31	7·0	12·74
Early Ottawa 76	Ottawa	Sept. 5	8·5	15·7
Russian Early	Ottawa	Sept. 8	10·5	19·32

FIELD ROOTS

The land on which the variety tests of roots were conducted is a sandy loam which was in potatoes in 1921. The fertilizer used for the potatoes was 200 pounds each of nitrate of soda and sulphate of ammonia, 900 pounds of acid phosphate and 165 pounds of muriate of potash per acre. The land was

manured with 15 tons of stable manure per acre in the spring of 1922 and ploughed and disced, after which 600 pounds of a 4-8-4 fertilizer was applied per acre and harrowed into the soil. The roots were seeded May 11 in rows 2½ feet apart.

TURNIPS

The seeding was done with the horse seed drill in drills made with a horse hoe and rolled before seeding. The plants were thinned to ten inches apart in the row. The plots were uniform and true to name, except Hall's Westbury and Aberdeen Yellow, which were not true, Harvesting was done on October 28. Each plot consisted of two rows 330 feet long, or five one hundred and thirty-seconds of an acre. The yields, calculated per acre, were:—

TURNIPS—TEST OF VARIETIES

Variety	Source of Seed	Yield per Acre			
		tons	lbs.	bush.	lbs.
Ditmars	K. V. Ditmars	23	1,256	945	6
Corning	United Fruit Co.	23	912	938	12
Elephant Swede	Halifax Seed Co.	22	1,804	916	4
Corning	Kentville	22	748	894	48
Imperial Hardy	Halifax Seed Co.	22	668	893	18
Kangaroo	Halifax Seed Co.	22	272	885	22
Monarch	E. F., Nappan	22	272	885	22
Invicta	United Fruit Co.	21	1,296	865	46
Bangholm	Halifax Seed Co.	21	688	853	38
Hall's Westbury	Halifax Seed Co.	20	1,236	824	36
Kangaroo	United Fruit Co.	20	1,052	821	2
Kangaroo	Lamont & Steadman	20	788	815	38
Good Luck	Lamont & Steadman	20	392	807	42
Bangholm	E. F., Charlottetown	19	1,468	789	18
Bangholm	United Fruit Co.	18	168	723	18
Ditmars	Kentville	16	736	654	36
Aberdeen Yellow	United Fruit Co.	12	948	498	48

MANGELS

These were seeded on level ground with the hand seed drill. The plants were thinned to 10 inches apart in the rows. The plots were two rows each 198 feet long, or one-forty-fourth of an acre. The plots were, on the whole, true as to variety. Harvesting was done October 26. The yields, calculated per acre, were:—

MANGELS—TEST OF VARIETIES

Variety	Source of Seed	Yield per Acre			
		tons	lbs.	bush.	lbs.
Leviathan	Lamont & Steadman	20	1,888	837	38
Mammoth Royal Giant	Lamont & Steadman	19	720	774	10
Mammoth Long Red	Halifax Seed Co.	18	80	721	30
Sludstrup	Kentville	17	1,640	712	40
Sugar Rose	Halifax Seed Co.	17	540	690	40
Half Sugar White	United Fruit Co.	17	540	690	40
Prize Mammoth Long Red	Lamont & Steadman	15	1,944	638	44
Yellow Intermediate	Exp. Farm, Ottawa	15	1,108	622	8
Giant Intermediate	United Fruit Co.	15	712	614	12
Danish Improved	Halifax Seed Co.	14	1,920	598	20
Gate Post	Halifax Seed Co.	14	1,788	595	38
Giant Yellow Intermediate	Halifax Seed Co.	14	1,568	591	18
Imperial Giant Sugar	Halifax Seed Co.	14	1,260	585	10
Yellow Globe	Halifax Seed Co.	14	468	569	18

CARROTS

These were seeded on level ground with the hand seeder. The plants were thinned to 4 inches apart. The roots were harvested October 28. The plants of each variety were fairly uniform. The plots were two rows each 132 feet long, or one-sixty-sixth of an acre. The yields, calculated per acre, were:—

CARROTS—TEST OF VARIETIES

Variety	Source of Seed	Yield per Acre			
		tons	lbs.	bush.	lbs.
Danish Champion	Ottawa, 1920	11	1,232	464	32
Danish Champion	Ottawa, 1922	11	572	451	22
White Intermediate	United Fruit Co	11	242	444	42
White Field Vosges	Halifax Seed Co	10	1,054	421	4
Danvers Half Long	United Fruit Co	9	612	372	12

SUGAR BEETS

The sugar beets were seeded on level ground with the hand seed drill. The plants were thinned to 8 inches apart in the row. The plots were two rows each 198 feet long, or one-forty-fourth of an acre. The crop was harvested October 28. The yields were as given below.

The percentage of sugar in the juice of the different varieties is also given. Sugar beets have been grown at this Station each year since 1913 and the average percentage of sugar in the juice for this period was 18·41. This would indicate that beets with high sugar content and suitable for sugar production can be grown in this section.

SUGAR BEETS—TEST OF VARIETIES

Variety	Source of Seed	Yield per Acre				Percentage of sugar in juice
		tons	lbs.	bush.	lbs.	
Klein Wanzleben	Halifax Seed Co	9	1,668	393	18	18·49
British Columbia	Dominion Sugar Co	9	480	369	30	19·10
Denmark	Dominion Sugar Co	8	192	323	42	19·54
Waterloo	Dominion Sugar Co	7	1,796	315	46	18·35
Chatham	Dominion Sugar Co	7	1,708	314	8	18·73
Vilmorin Improved	Vilmorin, Andrieux & Co., France	7	36	280	36	19·57
Sidney	Sidney, B.C.	6	1,640	272	40	17·28

GRIMM ALFALFA, SEEDED IN 1920

The season of 1922 was favourable for alfalfa, the summer precipitation being apparently ideal. This was in contrast to the season of 1921, when the light summer precipitation resulted in a very inferior summer growth with only one crop harvested as compared with three this year. The leaf spot which was so abundant in 1921 did not develop to any great extent in 1922.

The early spring growth was strong and even, all plants having wintered in excellent condition. The first cutting was made on June 13, the second on August 4, and the third on September 13. The quality of the hay was excellent. The yield of cured alfalfa hay in 1921 and in 1922 is given in the table below:—

GRIMM ALFALFA, SEEDED IN 1920

How Seeded	1921	Yield Cured Hay per Acre in Pounds			
		1922			Total
		1st cut	2nd cut	3rd cut	
Broadcast, nurse crop	3,130	3,230	2,340	1,940	7,510
Broadcast, no nurse crop	3,170	3,230	3,200	2,620	9,050
Rows 12″ apart, nurse crop	3,330	3,420	2,870	1,940	8,230
Rows 12″ apart, no nurse crop	3,580	3,350	2,080	1,400	6,830

The area seeded to Grimm Alfalfa in 1921 was in clover and timothy hay in 1920. This one-year sod was manured in the fall of 1920 at the rate of 12 tons of stable manure per acre, and plowed. In spring it was limed at the rate of 4 tons of ground limestone per acre, and the land thoroughly worked with the disc harrow. No commercial fertilizer was used. The area was seeded May 25.

Grimm alfalfa seeded 1920, second cutting, yield per acre 1922, 3 cuttings, 3 tons 1,510 lbs.

The broadcast seeding was done with the grain seed drill at the rate of 20 pounds per acre. The rows twelve inches apart were put in with the hand seed drill, 10 pounds of seed per acre being used. The nurse crop was oats, seeded at the rate of 2½ bushels per acre.

Because of the dry weather in 1921, alfalfa seeded that year made a very inferior growth, particularly where a nurse crop was used. The results would show a decided disadvantage from seeding with a nurse crop of grain. The production of oats on the area in 1921 was at the rate of 43 bushels per acre.

With favourable weather conditions in 1922, the nurse crop area rapidly recovered, so that at the end of the season the yield was nearly as good as on

the area started without a nurse crop. Cuttings were made June 13, August 4, and September 13. The results were as given in the table below. Much grass, particularly couch, developed in these plots during the year, which may render this planting useless for further test.

Seeded 1921	Yield per Acre in Pounds, 1922			
	1st cut	2nd cut	3rd cut	Total
How Seeded				
Broadcast, nurse crop	860	1,340	1,140	3,340
Broadcast, no nurse crop	2,680	1,170	1,240	5,090
Rows, 12" apart, nurse crop	460	1,980	1,420	3,860
Rows, 12" apart, no nurse crop	2,700	2,500	1,520	6,720

SWEET CLOVER

A plot of White Blossom sweet clover was seeded without a nurse crop in the spring of 1921. The plants made a good stand but, because of the dry season, were not as vigorous as one would have wished to see them. In the spring it was found that fully fifty per cent of the plants had been thrown completely out of the ground by the action of frost and that those that remained had been lifted in the soil, thus injuring the roots considerably. The latter plants recovered and a fair crop of coarse hay was secured, the yield being 3,080 pounds per acre.

HUBAM

Hubam, an annual sweet clover, was seeded on June 6, on a well-prepared seed bed. Unfortunately, very little of this seed germinated and what did germinate gave plants weak in growth that produced no crop for harvesting.

OTTAWA PERENNIAL CLOVER

This plot seeded in 1920 failed to prove perennial under climatic conditions here, the plants all being dead by the spring of 1922.

ALSIKE

An area was seeded broadcast at the rate of five pounds per acre, with wheat as a nurse crop. The stand was good and there was no evidence of winter injury. Facilities for threshing not being satisfactory the crop was cut for hay. The yield was 3,400 pounds of hay per acre.

EUROPEAN TUFTED BROME GRASS

This area was seeded in 1921 in rows twelve inches apart. The growth was vigorous with a good, even stand. The area was cut for seed and the yield as calculated from a one-twentieth acre plot was 420 pounds per acre. The hay product after threshing was 1,840 pounds per acre.

TEST OF VARIOUS GRASSES FOR HAY

These plots were one-twentieth acre each and were seeded in the spring of 1920, with oats as a nurse crop. The harvesting was done during the last week of July in each year.

TEST OF GRASSES FOR HAY

Variety	Stand May 21, 1922	Yield of Hay per Acre		
		1921	1922	Average
		lbs.	lbs.	lbs.
Red Top	Even, good	2,530	2,780	2,655
Western Rye	Even, good	1,900	2,640	2,270
Meadow Fescue	Uneven, fair	1,700	2,080	1,890
Kentucky Blue	Even, good	1,500	3,060	2,250
Orchard	Uneven, fair	1,100	2,200	1,650
Timothy	Uneven, fair	2,640	1,880	2,260

TEST OF GRASS MIXTURES FOR HAY

Below will be found a statement of the yield of hay in 1922 from areas in different grass and clover mixtures seeded in 1920, and also the yield from similar plots seeded in 1921. It should be pointed out that most of the red clover seeded in 1921 killed out during the following winter, undoubtedly because the plants had not made a strong growth during the unusually dry summer of seeding. The plants did not have sufficient root development to withstand the action of the frost in the early spring, and most of them were killed through being lifted out of the soil. The alsike, on the other hand, was much less injured in this particular. On similarly seeded plots, the second year in hay, it was particularly noticeable that the red top materially thickened the stand, and it would seem that areas to be left in pasture are likely to give better grazing if some red top is added to the mixture.

TEST OF GRASS MIXTURES FOR HAY

Plot	How Seeded per Acre		Yield of Hay per Acre					
			1921 seeded		1920 seeded			
			Yield, 1922		Yield, 1921		Yield, 1922	
		lbs.	tons	lbs.	tons	lbs.	tons	lbs.
1	Red clover	10	1	484	2	1,102	2	302
	Timothy	8						
2	Red clover	8	1	880	2	1,382	2	380
	Timothy	8						
	Alsike	2						
3	Red clover	5	1	1,160	3	1,384	2	1,250
	Timothy	8						
	Alsike	5						
4	Red clover	8	1	1,320	3	912	2	800
	Timothy	6						
	Alsike	2						
	Red top	2						
5	Red clover	8	1	1,000	3	260	2	900
	Timothy	4						
	Alsike	2						
	Red top	4						
6	Red clover	8	1	1,194	3	818	2	620
	Timothy	6						
	Alsike	2						
	Red top	2						
	Meadow Fescue	6						
7	Red clover	8	1	960	2	1,038	2	676
	Timothy	4						
	Alsike	2						
	Red top	4						
	Meadow Fescue	6						

TIMOTHY, RED CLOVER, ALSIKE AND TIMOTHY CLOVER HAY

Four areas were seeded in 1921 with wheat as a nurse crop to determine the respective yields of hay from timothy, alsike, red clover, and timothy and red clover mixed. Except in the matter of seed, all areas were treated alike. The crop was harvested at the one time and was properly cured for hay. It should be pointed out that the stand of red clover was poor, due to injury from heaving by frost during the latter part of March and early April. This was not the case with the alsike and timothy, which apparently are able to stand alternate freezing and thawing in the early spring much better than red clover is. Had there been better growing conditions during the previous summer, instead of the unusual dryness, a stronger root development would probably have largely prevented this loss in the red clover. The yield of hay per acre from these areas was as given below:—

HAY YIELDS FROM TIMOTHY AND CLOVERS

Seed Used	Quantity per acre	Yield of hay per acre
	lbs.	lbs.
Timothy	10	2,760
Red clover	10	1,920
Alsike clover	5	3,400
Timothy, 10 pounds Red clover, 8 pounds	18	2,880

TIMOTHY SEED GROWING

This area was seeded to timothy in 1920 with wheat as a nurse crop. The yield of timothy seed in 1921 was 280 pounds per acre; the hay yield after seed was removed was 1 ton, 220 pounds per acre. This area was in seed again in 1922 and yielded 157 pounds of seed, and 2,475 pounds hay per acre.

VALUE OF PRODUCT PER ACRE

	Hay	Seed
	$ cts.	$ cts.
1921—2,220 lbs. timothy hay at $10 per ton	11 10	
1921— 280 lbs. timothy seed at 10c. per lb	.....	28 00
1922—2,475 lbs. timothy hay at $10 per ton	12 38	
1922— 157 lbs. timothy seed at 10c. per lb	.....	15 70
Value of hay and seed per acre	23 48	43 70

TIMOTHY SEED FOLLOWING CLOVER

This area was seeded in 1920 with eight pounds of clover and ten pounds of timothy seed per acre. The yield of clover hay in 1921 was 2,660 pounds. The yield of timothy seed in 1922 was 186 pounds, and of timothy hay after seed was removed, 3,052 pounds per acre. It should be stated that the timothy on this area was entirely free from other grasses, such as red top, which were present in small amounts in timothy and growing experiment reported just above. This is a very satisfactory way of securing good stands of timothy free from other grasses or weeds.

VALUE OF PRODUCT PER ACRE

	Hay	Seed
	$ cts.	$ cts.
1921—2,660 lbs. clover hay at $18 per ton	23 94	
1922—3,052 lbs. timothy hay at $10 per ton	15 26	
1922— 186 lbs. timothy seed at 10c. per lb	.....	18 60
Value of hay and seed per acre	39 20	18 06

CLUB-ROOT RESISTANT STRAIN OF TURNIPS

Tests were continued with seed of the club-root resistant strain of Bangholm swede from Denmark. The results were exceedingly satisfactory and indicate the possibility of this variety's resisting this destructive disease. Alongside this, a well-known trade variety was planted in order to compare yields. The area on which both of these were grown is infested with the organism that causes club-root. On one series of plots the land was limed in 1916. On another it was limed in 1916, 1918 and 1921. The results were as follows:—

	When limed	Yield per acre
		bushels
Bangholm	1916	820
Trade variety	1916	0
"	1916–1918–1921	140

TURNIP SEED PRODUCTION

The prevalence of club-root in stecklings has made the growing of turnips for seed impossible. The Bangholm club-root resistant strain from Denmark, however, has made possible the saving of a good supply of these roots for planting for seed next spring.

BANGHOLM CLUB-ROOT RESISTANT STRAIN OF SWEDE TURNIP

Experiments have been continued with the Bangholm resistant strain of Swede turnip obtained from Denmark. The tests made in 1921 were very favourable, showing only 6·9 per cent with traces of this disease as compared with 61 per cent of the disease in a commercial variety, with many of the roots of the latter unfit for feeding. Seed was again obtained from Denmark, and a comparison was made of the crop from this seed, and of the crops from seed of this strain grown at Kentville and Charlottetown in 1921. The experiment was conducted on plots limed in 1916, and again in 1918, with different rates of limestone, and on plots that had not been limed. The stand was perfect and from a close survey of the area, before harvesting, the crop would have been considered entirely free from club-root. The yield averaged 820 bushels to the acre with none of the roots unfit for storage or feeding. On close examination, evidence of what was supposed to be traces of this disease was detected. As all the roots were saved for seed production, a classification was made so that those showing evidence of the disease could be followed to determine whether, in the seed produced from them, the resistance to club-root would be lessened. It would appear, however, that this resistance is a fairly constant character, as the seed produced at both Kentville and Charlottetown from roots grown in 1920 at these Stations proved to be equally as resistant as that imported from Denmark. From the photograph (p. 68), it will be seen that the row of commercial seed used has been completely killed out by the disease, while the four rows comprising the other three lots, two at either side of the commercial variety, are in a vigorous healthy condition. The classification of these roots as made for seed production was as given in the table below:—

TESTS OF BANGHOLM CLUB-ROOT-RESISTANT STRAIN

How Treated	Bangholm Denmark						Bangholm Charlottetown						Bangholm Kentville					
	Limed 1916			Limed 1916-1918			Limed 1916			Limed 1916-1918			Limed 1916			Limed 1916-1918		
	Med.	Slight	Free	Med.	Slight	Free	Med.	Slight	Free	Med.	Slight	Free	Med.	Slight	Free	Med.	Slight	Free
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Quicklime—																		
1,500 pounds	15	35	50	.....	30	70	5	20	75	5	15	80	15	25	60	5	40	55
3,000 pounds	10	40	50	5	45	50	.....	30	70	.....	25	75	10	15	75	10	25	65
4,500 pounds	.....	20	80	.....	25	75	5	40	55	5	30	65	5	30	65	5	20	75
6,000 pounds	5	25	70	.....	70	30	.....	40	60	15	45	40	20	15	65	5	20	75
Limestone—																		
3,000 pounds	20	20	60	5	25	70	5	30	65	10	35	55	10	25	65	10	25	65
6,000 pounds	15	20	65	5	45	50	5	65	30	.....	45	55	5	15	80	10	15	75
9,000 pounds	.....	25	75	5	30	65	5	40	55	5	30	65	15	20	65	5	25	70
12,000 pounds	10	25	65	15	35	50	5	30	65	.....	30	70	5	20	75	.....	20	80
	Limed 1918			Not Limed			Limed 1918			Not Limed			Limed 1918			Not Limed		
	Med.	Slight	Free	Med.	Slight	Free	Med.	Slight	Free	Med.	Slight	Free	Med.	Slight	Free	Med.	Slight	Free
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Quicklime—																		
6,000 pounds	.....	20	80	.....	.....	.....	.....	35	65	.....	.....	.....	15	35	50	.....	.....	.....
Not limed	.....	.....	.....	5	55	40	.....	.....	....	5	50	45	.....	.....	.....	25	25	50

CLUB ROOT CONTROL

Experiments which have been conducted at this Station for several years, with the object of determining whether lime applied to the soil will eliminate the club-root organism, were continued in 1922. A commercial variety of Swede turnip was used, and on adjoining rows the Bangholm club-root resistant strain from Denmark was grown.

On one series of these plots, lime had been applied in 1916 at the rates of 1,500, 3,000, 4,500 and 6,000 pounds quicklime per acre, and on other areas at the rates of 3,000, 6,000, 9,000 and 12,000 pounds of ground limestone per acre. In 1918, these amounts were again applied, at the same rates respectively to the

Outside two rows club-root resistant Bangholm—Centre row trade variety. Bangholm yield 820 bushels per acre. Trade variety Complete loss.

areas limed in 1916. To certain of the areas left untreated in 1916, 6,000 pounds quicklime was applied. In 1921, those areas treated in 1916 and 1918 were again treated with the same amounts respectively and one of the originally untreated areas that had been limed in 1918 was treated with 6,000 pounds of quicklime again.

The results, as tabulated below, give very little encouragement for the control of club-root by applications of lime. It is interesting to note that the Bangholm resistant strain matured a good crop of roots, yielding 820 bushels per acre, while the areas treated in 1916, 1918 and 1921 and seeded to a commercial variety produced only 140 bushels per acre. Nearly all of these latter were so decomposed in the centre at the base of the root that they were considered unfit for feeding. Only three roots persisted on the areas limed in 1916 only. Two of these were on the plots treated at the rate of 12,000 pounds of limestone per acre, and one on the area treated at the rate of 6,000 pounds of quicklime per acre. The three were considered unfit for feeding.

The results from this test are set forth in the table below. The Bangholm resistant strain is introduced into the table, and while mention is made of the presence of club-root in this strain, in no case was the disease on any of the roots comparable with that on the commercial variety. The Bangholm roots were in fine storage condition, and only on careful examination could what was supposed to be diseased roots be detected. Certainly the production was not decreased. From the general appearance of the plots, no disease seemed present, and a classification was made of the roots for the purpose of seed production, all the roots being saved for this purpose. Further information regarding this strain is given under the heading "Bangholm club-root resistant Swede turnip."

CLUB-ROOT CONTROL WITH LIME, 1922

COMMERCIAL SWEDE

How Treated	Limed 1916	Limed 1916 and 1918			Limed 1916-1918-1921			Bangholm resistant strain limed 1916	
	Killed out	Killed out	Very bad	Bad	Killed out	Very bad	Bad	Slight	Free
	per cent	per cent	per cent	per cent	per cent	per cent	per cent	per cent	per cent
Quicklime—									
1,500	100	100			77·0	19·2	3·8	38	62
3,000	100	80·8	15·4	3·8	7·7	53·8	38·5	35	65
4,500	100	27·0	23·0	50·0	7·7	15·4	76·9	33	67
6,000	99	0·0	11·5	88·5	7·7	11·5	80·8	35	65
Limestone—									
3,000	100	84·6	15·4	0·0	73·0	27·0		27	63
6,000	100	15·4	53·8	30·8	57·7	27·7	15·3	32	68
9,000	100	3·9	23·0	73·1	23·0	15·4	61·6	35	65
12,000	98	0·0	0·0	100·0	34·6	19·2	46·2	31	69
Quicklime—		Limited 1918 only			Limed 1918 and 1921				
6,000		84·6	15·4	·0				35	65
6,000					30·8	38·4	30·8		
Check not treated								55	45

FERTILIZER EXPERIMENTS

FERTILIZER AND LIME EXPERIMENT

This test, which was started in 1914, has as its object a determination of the most profitable sources of nitrogen and phosphorous, and the value of lime applied when seeding down. The areas were uniform when the work started and have been treated alike on each series of plots, except that one series has been limed and one not limed. The plots are in duplicate, so that the results are the average of two plots of one-twentieth acre each. Details of this experiment are given in the accompanying table:—

FERTILIZERS APPLIED—1914, 1917, 1920

Plot	Nitrate of Soda (15% N)	Sulphate of Ammonia (20% N)	Acid Phosphate (15% P_2O_5)	Basic Slag (16% P_2O_5)	Bone Meal (25% N 22% P_2O_5)	Muriate of Potash (50% K_2O)
	lb.	lb.	lb.	lb.	lb.	lb.
1	140	.....	150	150	.....	101·2
2	.....	105	150	150	.....	101·2
3	70	52½	300	.....	.....	101·2
4	70	52½	.....	300	.....	101·2
5	50	52½	.....	.....	240	101·2
6		No fertilizer				

YIELDS FROM FERTLIZED PLOTS

	Potatoes 1914–17–20 Total Yield	Hay 1916–19–22 Total Yield	Wheat 1918-21 Total Yield		Oats Total	1915 Yield
			Grain	Straw	Grain	Straw
	Bush.	lb.	bush.	lb.	bush.	lb.
1. Limed	607·3	9,640	44·4	4,920	37·9	2,200
Not limed	581·3	4,630	34·5	3,430	32·6	1,970
Gain	26·0	5,010	9·9	1,490	5·3	230
2. Limed	588·4	9,000	44·3	4,700	38·5	2,250
Not limed	568·9	4,290	31·5	2,810	29·1	1,590
Gain	19·5	4,710	12·8	1,890	9·4	660
3. Limed	618·9	9,270	45·2	4,640	36·9	2,115
Not limed	583·8	4,520	31·6	3,110	31·8	1,785
Gain	35·1	4,750	13·6	1,530	5·1	330
4. Limed	638·2	10,450	48·5	4,520	40·4	2,405
Not limed	585·6	4,840	34·4	3,530	31·1	1,900
Gain	52·6	5,610	14·1	990	9·3	505
5. Limed	614·2	9,360	45·2	4,910	38·2	2,020
Not limed	536·9	4,590	35·3	3,750	33·6	1,845
Gain	77·3	4,770	9·9	1,160	4·6	175
6. Limed	530·9	7,300	41·9	3,950	32·7	1,575
Not limed	461·7	4,020	28·3	3,270	30·4	1,615
Gain	69·2	3,280	13·6	680	2·3	40

BASIC SLAG EXPERIMENT

This experiment covers a period of two years. In the first year, different grades of slag were used at different rates per acre, as stated in the table below. The results are the average of two plots of one-twentieth acre each. The yield of clover in 1922 was light, due to poor growth in the dry summer of 1921,

followed by injury from the frost throwing out the plants in March and early April, 1922. The results were as given below:—

BASIC SLAG EXPERIMENT

Kind of Slag	Quantity per acre	Yield per acre Oats in 1921		Hay, 1922
		Grain	Straw	
	lb.	bush.	lb.	tons
Victory, 8%	500	52·6	2,060	0·89
B, 11·2%	500	52·3	2,160	1·17
Belgian, 16%	500	51·7	2,500	1·66
Victory, 8%	1,000	46·9	2,090	1·27
B, 11·2%	1,000	53·1	2,370	1·22
Belgian, 16%	1,000	62·3	3,220	1·865
Victory, 8%	750	55·2	2,470	1·15
B, 11·2%	536	45·2	2,110	0·885
Belgian, 16%	375	50·5	2,780	1·12
Belgian, 16%	470	59·3	2,890	1·5
Acid phosphate, 16% and limestone	375 / 4,000	54·1	2,900	1·63
Limestone	4,000	47·3	2,000	1·02
Limestone	2,000	50·7	2,320	1·37
Plots not treated	.....	51·5	2,560	1·04

NITRAPO EXPERIMENT

Nitrapo contains 15 per cent nitrogen and 15 per cent potash. In order to determine its value for crop production, tests were started in 1921 with potatoes, followed by a crop of wheat in 1922. The quantities applied per acre in 1921 are stated in the table below, and also the rate of which other fertilizers were applied on adjoining plots for comparison. The results would indicate that this material has no value for crop production above nitrate of soda and muriate of potash.

NITRAPO EXPERIMENT

Plot	How Fertilized	Quantity per acre	Yield per acre				
			Potatoes 1921			Wheat, 1922	
			Marketable	Unmarketable	Total	Grain	Straw
		pounds	bush.	bush.	bush.	bush.	tons
1	Nitrapo	200	142·0	39·0	181·0	12·4	0·61
2	Nitrate of soda	200	129·1	22·3	151·4	13·1	0·765
3	Sulphate of ammonia	150	119·0	36·8	155·8	13·6	0·88
4	Not fertilized	.....	113·3	30·3	143·6	13·15	0·825
5	Nitrapo Superphosphate	200 300	108·3	32·6	140·9	11·5	0·685
6	Nitrate of soda Superphosphate	200 300	107·8	33·5	141·3	13·4	0·68
7	Nitrate of soda Superphosphate Muriate of potash	200 300 60	111·3	31·1	142·4	12·3	0·77
8	Sulphate of ammonia Superphosphate	150 300	130·6	32·1	162·7	12·1	0·595
9	Sulphate of ammonia Superphosphate Muriate of potash	150 300 60	138·0	32·8	170·8	12·45	0·61

GROUND LIMESTONE APPLIED AT DIFFERENT RATES PER ACRE

Previous to the inception of this experiment, all parts of the area had received similar treatment, and the only difference in treatment afterwards has been in the amount of lime applied. The lime was applied in 1917. The production of clover hay in 1921 and of timothy hay in 1922 are given below, and also the gain from each treatment over the area not limed.

GROUND LIMESTONE APPLIED AT DIFFERENT RATES

How treated	Clover Hay, 1921		Timothy Hay, 1922	
	Yield per acre	Increase due to lime	Yield per acre	Increase due to lime
	lb.	lb.	lb.	lb.
No lime	3,054	.....	1,395	
Limestone, 1 ton	4,356	1,302	2,355	960
" 2 tons	4,680	1,626	2,436	1,041
" 3 tons	4,920	1,866	2,985	1,590
" 4 tons	5,140	2,086	3,255	1,860

NITRATE OF SODA AS A TOPDRESSING FOR OATS

In order to gain some information as to the value of applying a surface application of nitrate of soda to oats after they have become established and when two to three inches high, duplicate plots of one-twentieth acre each were treated early in June at different rates per acre. The cost of application is calculated at 30 cents per acre. The nitrate of soda cost $60 per ton. The oats were valued at 68 cents per bushel, and the straw at $6 per ton. The season was wet and where 200 pounds or over was applied the grain lodged badly. The results would indicate that 100 pounds per acre is the most economical application in a season such as 1922. The results were as follows:

NITRATE OF SODA AS A TOPDRESSING FOR OATS

Nitrate of Soda applied per acre	Yield per acre		Gain over Plot not treated		Per acre		
	Grain	Straw	Grain	Straw	Value of gain	Cost of gain	Profit
	bush.	tons	bush.	tons	$ cts.	$ cts.	$ cts.
Plots not treated	55·6	1·14					
100 pounds	67·7	1·455	12·1	0·315	10 11	3·30	6 81
150 pounds	65·75	1·33	10·15	0·19	8 04	4 80	3 24
200 pounds	69·02	1·545	13·42	0·405	11 55	6 30	5 25
250 pounds	67·8	1·543	12·2	0·403	10 70	7 80	2 90
300 pounds	63·6	1·598	8·0	0·458	8 18	9 30	−1 12

NITRATE OF SODA AS A TOP DRESSING FOR GRASS LANDS

In order to gain information as to the value of scattering nitrate of soda broadcast on hay lands in the spring to increase yields, triplicate plots of one-twentieth acre each were treated at different rates per acre. Because of delay in delivery of the nitrate of soda, it could not be applied until June 7th, two to three weeks after it should have been applied. The land on which this work was carried on was in clover and timothy hay in 1921, and was practically all timothy in 1922. It was a very uniform field for this test. It will be noted

that the crop was increased by the various applications, but that the increase in value did not cover the cost of material and application. However, had the application been made earlier, no doubt profits would have been secured.

In addition, duplicate plots on the dyked area were top-dressed with nitrate. These showed slightly more gain than the upland area, due doubtless to the growth's being later on dyked lands.

The nitrate of soda cost $60 per ton, and the cost of application was 30 cents per acre. The hay is valued at $12 per ton. The results are given below:

NITRATE OF SODA APPLIED TO GRASS LANDS

Nitrate of Soda applied per acre	Yield per acre	Gain over plot not treated	Per Acre		
			Value of Gain	Cost of Gain	Profit
	tons	tons	$ cts.	$ cts.	$ cts.
Upland					
Plots not treated	2·368				
100 pounds	2·507	0·139	1 66	3 30	1 64
150 pounds	2·413	0·045	0 54	4 80	4 26
200 pounds	2·713	0·345	4 14	6 30	2 16
250 pounds	2·67	0·302	3 62	7 80	4 18
300 pounds	3·033	0·665	7 98	9 30	1 32
Marsh Lands					
Plots not treated	2·25				
150 pounds	2·57	0·32	3 84	4 80	0 96
300 pounds	2·9	0·65	7 80	9 30	1 50

POULTRY

NEW BUILDING

A poultry house for experimental and breeding work, 90 by 16 feet, divided into 10 pens, was constructed during the year. This house has a concrete floor and a peak roof. The ceiling is made of five-inch boards placed three-fourths of an inch apart; the space above it is filled with straw. The concrete floor has been dry and the building throughout has been satisfactory. There is not so much opportunity for sunlight to enter with this style of construction as with the shed roof house, but the straw above, which cannot be provided in the shed roof building, prevents condensation of moisture and frost formation above the hens in cold weather and keeps the house cooler in summer.

STOCK KEPT

Seventy-five Barred Plymouth Rock and White Wyandotte hens were carried over from the pullet year and 150 Barred Rock and 24 White Wyandotte pullets were put into laying quarters. One hundred White Leghorn Pullets from Ottawa made four pens of twenty-five each of excellent producing stock.

TRAPNESTING

Trapnesting makes possible the obtaining of the laying records of each individual bird. When these are known, hens that are poor layers can be eliminated from the flock. After fertility tests are made of the eggs of the good producers, it is possible to eliminate the hens that are weak in reproductive ability. The birds at this Station producing below 200 eggs in the pullet year are discarded for breeding work, and even some of the high producers lacking

in size of egg or in other desirable qualities may not be used for breeding. The table below indicates the production of the best hens at this Station and it is from the best of these that the present stock is being developed.

TRAPNESTING RECORDS

(Barred Plymouth Rock Hens, three years old.)

Number of Hen	Pullet year 1920	Second year 1921	Third year 1922	Total
53	248	189	124	561
87	247	71	43	361
63	246	178	120	544
4	237	108	38	383
99	236	145	65	446
64	231	164	126	521
41	222	90	40	352
48	219	88	100	407
203	206	124	105	435
50	205	127	116	448
43	205	112	63	380
70	201	116	58	375
C-5	189	117	106	412
Average	222·4	125·3	84·9	432·7

(Barred Plymouth Rock Hens, two years old.)

No. of Hen	Pullet year 1921	Second year 1922	Total
E-5	278	134	412
36	218	183	401
16	217	91	308
85	205	146	351
39	200	123	323
27	195	164	359
82	186	134	320
81	186	96	282
Average	210·6	134	344·5

(White Wyandotte Hens, three years old.)

No. of Hen	Pullet year 1920	Second year 1921	Third year 1922	Total
119	293	182	56	531
126	241	105	76	422
102	219	130	76	425
120	212	147	90	449
124	205	78	71	354
Average	234	128·4	·74	436

(Barred Plymouth Rocks, pullet year, 1922.)

Over 200 Eggs		Over 170 Eggs		Over 160 Eggs		Over 100 Eggs	
No. of Hen	Eggs	No. of Hen	Eggs	No. of Hen	Eggs	No. of Hen	Eggs
88	261	39	191	246	169	286	146
14	243	109	191	17	168	32	146
281	240	92	185	69	167	244	145
16	237	24	183	101	166	34	142
15	233	103	183	105	162	51	142
42	231	26	178	47	162	77	135
60	219	81	176	36	161	10	135
75	218	35	175	236	160	202	135
284	210	201	172	63	158	83	131
86	205	32	171			33	114
102	201	89	171			46	109
		90	171			74	102
Average	227	Average	179	Average	163·6	Average	132

ADVANTAGE OF PULLETS OVER HENS FOR EGG PRODUCTION

An examination of the results tabulated above reveals the advantage of pullets over hens for egg production. This can clearly be seen in a summary as,—

No. of Hens	Breed	Average Production		
		1st year	2nd year	3rd year
13	Barred Plymouth Rock	222·4	125·3	84·9
5	White Wyandottes	234	128·4	74
8	Barred Plymouth Rocks	210·6	134	

The advantage of carrying over hens is that they give better eggs for hatching, the chicks produced having greater vitality than those from pullets' eggs. Trapnesting enables an intelligent selection to be made from the best hens and an elimination of the undesirable producers. The expert in culling can determine fairly well which ones should be discarded, but the trapnest is the only entirely reliable guide.

EGG PRODUCTION

The egg production for the nine months, April 1 to December 31, was 13,739 or 1,145 dozens.

Value of 1,145 dozen at 50 cents per dozen	$ 572.50
Total cost of the feed for the period	332.03
Profit over feed for nine months	$ 240.47

FEEDING

The feeding system followed with laying stock has been to give to every twelve hens one pint of oats in the morning, and one quart of equal parts of wheat and corn in the afternoon. The advantages of this system are that the hens are kept active all day cleaning up anything that may have been left in the litter from the night before, and also that they have a full crop to carry them through the night. Wet mash is fed at noon at the rate of 5 pounds of

dry mash per 100 hens. Dry mash of the same kind is before the hens in a hopper at all times. The mash was made up as follows:—

200 pounds oats at $2.10	$ 4.20
200 pounds corn meal at $2.25	4.50
100 pounds bran	1.60
100 pounds shorts	1.75
25 pounds oil meal at $3.50	0.88
25 pounds beef scrap at $6.00—	1.50
	$ 14.43

or a cost of $2.22 per 100 pounds. Grit was supplied at the rate of 4 to 6 pounds per 25 birds per month. Green feed consisting of mangels and alfalfa hay has been fed during the winter. Charcoal is always available in hoppers.

Brooder houses.

The feed for 100 hens per day has worked out as follows,—

19 pounds scratch grain at $2.53	$ 0.48
6 pounds dry and wet mash at $2.22	0.13
1 pound beef scrap	0.06
8 pounds green feed at ¼ cent	0.02
1 pound oyster shell and grit at 3 cents	0·03
Total per day	72 cents

or, for 100 hens per month of 30 days, $21.60, for 1 hen per month of 30 days, 21·6 cents. The cost of the various feeds per hen per month of 30 days was,—

Scratch grain	14·3 cents
Mash	4· "
Meat scrap	1·8 "
Green feed and grit	1·5 "
	21·6 cents

HOME-MIXED VS. COMMERCIAL SCRATCH GRAINS

The object of this experiment was to determine the relative value of commercial scratch grain as compared with separate grains home-mixed. The home-mixed grain consisted of 100 pounds of oats and 150 pounds each of wheat and cracked corn. The oats cost 2¼ cents, the corn 2½ cents and the wheat 3½ cents per pound, or an average of $2.75 per 100 pounds. The commercial scratch grain cost $3.25 per 100 pounds. The amount of green feed, dry mash, etc., fed in addition to the scratch grain was the same in each pen, the only difference being in the kind of scratch grain given. The same amount of scratch grain was fed to each pen. The pens consisted of 35 Barred Rocks each. The test covered a period of three months, January 1 to April 1. The results were as given in the table below,—

HOME-MIXED VERSUS COMMERCIAL SCRATCH GRAINS

Month	Pen 1 Home-mixed Grain	Pen 2 Commercial Scratch Grain
	No. of eggs	No. of eggs
January	332	202
February	420	466
March	517	572
	1,269	1,240

It will be noticed that the production of the two pens for this period was practically the same; however, for the second and third months, the hens on the commercial scratch grain gave a better egg yield than those given the home-mixed grains. This test will later be continued for a more extended period.

CHICKEN FEEDING TESTS

One hundred and fifty chickens ranging from two to three months old were divided into three lots of fifty each on July 25 for a feeding test. The birds were so selected as to have each lot as uniform as possible. The three lots were fed as follows,—

Lot 1.—Grain and mash before them in hoppers at all times.

Lot 2.—(*a*) Grain and mash before them in hoppers at all times.

(*b*) Wet mash fed at noon composed of 2 pounds dry mash mixed with water.

Lot 3.—(*a*) Grain fed by hand scattered upon the ground twice a day, as much as hens would clean up each time.

(*b*) Wet mash fed at noon, composed of 4 pounds dry mash mixed with water.

1. Grit, charcoal and beef scrap were supplied continuously to all the pens in hoppers.

2. The mash mixture was made up of 100 pounds of corn meal at $2.40, 100 pounds of crushed oats at $2, 100 pounds of shorts at $2.15 and 25 pounds of oil meal at 3 cents per pound, the mixture costing $2.25 per 100 pounds.

3. The grain ration was a mixture of equal parts of wheat and corn.

In the table below are given the weight and cost of feed consumed, the gain, and the cost per pound of gain,—

CHICKEN FEEDING EXPERIMENT

	Cost of Feed per 100 lbs.	No. 1, Hopper fed		No. 2, Hopper fed 2 lbs. wet mash daily		No. 3, Hand fed 4 lbs. wet mash daily	
		Feed	Cost	Feed	Cost	Feed	Cost
	$ cts.	lbs.	$ cts.	lbs.	$ cts.	lbs.	$ cts.
Corn, cracked	2 25	375	8 43	375	8 43	325	7 31
Wheat	3 00	375	11·25	375	11 25	325	9 75
Dry mash	2 25	45	1 01	35	0 78		
Dry mash, fed wet	2 25	.....	.....	180	4 05	360	8 10
Beef scrap	6 25	27·5	1 72	27·5	1 72	22·5	1 40
Grit	1 50	19	0 28	19	0 28	12	0 18
Charcoal	3 00	3	0 09	3	0 09	3	0 09
Total	.....	844·5	22 78	1,014·5	26 60	1,047·5	26 83
Weight at start, July 25	.....	105	.....	100	.....	95	
Average weight at start, July 25	.....	2·1	.....	2·	.....	2 1·9	
Weight at finish, October 25	.....	280	.....	276	.....	69	
Average weight, October 25	.....	5·6	.....	5·5	.....	5·4	
Average gain per bird	.....	3·5	.....	3·5	.....	3·5	
Average cost of feed per bird	.....	.....	45·5	.....	53·2	.....	53·6
Cost of one pound gain	.....	.....	13	.....	15·1	.....	15·4

The chickens were weighed on October 25th after being fed three months. It is evident that hopper feeding may be practised successfully, the gain per bird being equal to the gain of those fed by hand and at less cost for feed and labour.

It will be noted that the birds in Lot 1, fed on dry feed only, consumed very much less mash than those given wet mash, but consumed more whole grain than Lot 3, fed with wet mash.

PROFITS

Estimating that the above chickens were worth, at the commencement of the test, fifty cents each, which amount it is believed more than covers the actual cost, the profits from the lot would be as follows:—

150 chickens at 50 cents	$ 75 00
Cost of feed for three months	76 21
825 pounds at 28 cents per pound	151 21
	231 00
Profit	$ 79 79

THE APIARY

During the winter of 1921-22, sixty colonies of bees were wintered in quadruple cases. Of these, thirty-two colonies were packed in cases which were large enough to allow four inches of shavings around the sides and deep enough for a super to be placed on the colonies in the spring. The bottoms of these cases are double and were packed between with three inches of shavings. On top of the cases eight inches of shavings in bags were placed. The entrances, which are eight inches long by one-half inch deep, and are opposite those of the hive, were reduced for winter to two inches by one-half inch. Twenty-eight colonies were packed in the old cases, which do not have a bottom board. Six inches of shavings are put in these cases on the ground, the hives placed thereon, and the side spaces, approximately eight inches wide, packed with shavings. This amount of packing is not necessary, as colonies that had only four inches around the sides came through equally as well in previous winters. These cases when built were not made deep enough for a super to be placed on the hives when needed. They have proved unsatisfactory, as the water during the thaws, which often occur here in January, finds its way into the bottom packing. This brings about a mouldy condition in these colonies. Also, where such conditions exist, granulation of honey takes place, especially in the outside combs. This condition being far from satisfactory, nine new cases were made during the fall of 1922. The construction of these cases allows four inches of packing around the sides of the colonies and is deep enough for a super to be placed on each colony when required. The bottoms of the cases were made of matched lumber on which were nailed inside four pieces of two-by-four, on edge. This allows four inches of packing under each colony. On top there is room for eight inches of packing.

On May 2, 1922, a thorough examination was given the colonies; the average number of combs per colony covered by bees was 4·9.

Fruit bloom is an uncertain source of honey, owing to the short period the trees are in bloom. Weather conditions are also often unfavourable because of low temperatures or rain. Unfortunately, fruit trees in this district are not as great an asset to beekeepers as they were before the advent of dusting with an arsenical dust. Considerable losses have occurred from this cause. When the bees are collecting pollen, a certain amount of dust becomes incorporated with it. When the pollen containing this dust is fed (mixed with honey and known as "bee bread") to the larvae by the nurse or young bees, a great many of the larvae become poisoned and die, as do some of the nurse bees. The greater loss is among the larvae. These conditions are first drawn to one's attention by the number of young bees crawling in the grass in front of the hives. On examination they are found to be semi-active, with their abdomens twice the normal size. When the abdomen is squeezed and broken, four or five drops of an amber-coloured liquid will be seen. During the first part of the bloom period, the bees evidently got the dust while working on the dandelion, which is in full bloom at that time; during the latter part of the period, and until the last dust was applied (usually some few days after the bloom had fallen), while working principally on the Wild Radish (*Raphanus Raphanistrum*), which grows in abundance in many of the orchards. A chemical analysis was made of these bees at Ottawa and by the Bureau of Entomology, Washington. Both reported enough arsenic was found in the samples to cause the death of the bees.

SOURCES OF HONEY

In addition to fruit bloom as a source of honey, alsike, Dutch clover, aster and golden rod can generally be depended upon, providing weather conditions

are favourable during their periods of blooming. Other flowers of importance from which the bees are able to gather nectar or pollen, are mentioned below, with the approximate date of bloom of each. Those that bloom in the spring stimulate brood rearing, while those that bloom between the main honey flows often provide sufficient nectar to make feeding unnecessary. The following are the most important:

Flower	Bees first seen working thereon
Mayflower	April 26
Willow	May 21
Wild cherry	May 21
Dandelion	May 21
Honeysuckle	June 5
Cultivated strawberry	June 5
Blueberries	June 5
Wild Mustard	June 9
Cultivated raspberries	June 21
Wild roses	July 4

PRODUCTION

The production of honey this year has been below the average. Owing to the very dry season of 1921 fields that were sown down to clover germinated very poorly, with the consequence that there was very little clover for the bees to work on the next season. Not only did this condition exist but weather conditions also were not favourable for the secretion of nectar, or for the bees to work in, owing to frequent rains. Practically no gains were shown by colonies on scales during the period alsike and Dutch clovers were in bloom. Weather conditions during the fall, however, were ideal for the gathering of nectar. During this period, the bees gathered a surplus of 1,529 pounds. The chief source of this honey was wild aster (various species) and golden-rod (*Solidago bicolor*). The record of production for the last four years is given below:—

Year	Number of Colonies	Number of Colonies in Fall	Pounds of Honey produced	Average per Colony Spring count
1919	21	36	2,577½	122·7
1920	32	56	1,168	36·5
1921	43	60	1,681½	39·1
1922	41	69	1,685½	41·1

CONDITION OF COLONIES IN THE AUTUMN

With such favourable conditions for gathering honey, the latter part of August and early September saw brood-rearing at its height. During this period nuclei built up very rapidly; also full colonies were strengthened by an abundance of young bees. Consequently all colonies went into winter quarters very strong with young bees. The average number of combs covered on October 6 was 8·1 per colony.

COLONIES ON SCALES

Three colonies were placed on platform scales shortly after they were taken out of their winter cases in the spring. These colonies were weighed every morning at seven o'clock. The individual weights were tabulated on forms kept

for this purpose. In this way the net loss or gain each day throughout the season was recorded. The value of weighing colonies on scales is that the scales indicate when a flow is on the increase in weight. This eliminates guess work and gives the beekeeper a good idea of just what his colonies are doing and when to add supers.

QUEEN REARING

Queen rearing was continued this season. Two purely-mated Italian queens were procured from Ohio. Larvæ from these queens were used in producing the queens raised this season. Of the queens raised, eighty-five per cent were purely mated. Over eighty per cent of the colonies were re-queened with these and, in addition, the local demand was supplied.

INCREASE

Between July 10 and 17, twenty-three nuclei were made by taking two frames of emerging brood with adhering bees, one comb of honey and an old queen from each of twenty-three strong colonies. Young queens of selected parentage, raised earlier in the season, were introduced into the old colonies. Each of the nuclei was placed in an empty hive on a new stand. A division board was put in close to these combs to conserve the heat, and entrances were reduced to two inches until the nuclei became strong. As the season advanced, empty drawn combs were given as required. The queens that were not prolific, or for some other reason were not desirable, were replaced by young Italian queens. Owing to the late flow of honey in the fall, these nuclei built up to strong colonies by the middle of September.

SWARM CONTROL

The de-queening of colonies that had a tendency to swarm and re-queening them nine days later with young bees of selected parentage, proved the best method of swarm control so far practised in the management of this apiary.

TWO-POUND PACKAGES OF BEES

In order to test out the advisability of procuring two-pound packages of bees from a distance, two two-pound packages were ordered from Ohio and two from Ontario. The four packages arrived in good condition on May 22. Each was transferred to a ten-frame hive and provided with five drawn combs, one of which was filled with honey. The rest of the space in each hive was filled with frames of foundation. Not only did these packages build up to strong colonies by fall but, during the season, they drew out a total of sixty sheets of foundation and stored 122 pounds of surplus honey.

TRANSFERRING

During the earlier part of the season, all eight-frame colonies were transferred to ten-frame hives, the eight-frame hive being considered too small for a brood chamber. Five colonies in ten-frame "Langstroth" hives were transferred to five ten-frame "Jumbo" hives. This was done by placing "Jumbo" supers on each of the five hives to be transferred. As soon as the bees drew out the foundation in these and the queens started laying, the positions of brood chamber and super were reversed, so that the "Jumbo" super became the brood chamber and the original brood chamber became a super. After making sure that the queen was in the lower chamber, a queen excluder was placed between the brood chamber and the super.

PRODUCTION FROM COLONIES ALLOWED TO SWARM AS COMPARED WITH THOSE WHERE SWARMING WAS CONTROLLED

This experiment, to determine the average profit of colonies that were increased through division, as compared with those that were not divided or did not swarm, was again conducted this year. The results this season would indicate that during a wet season such as 1922, a greater profit is obtained in this district by increasing the colonies than by depending on the honey gathered.

Number of Colonies	Number of Increase from six colonies	Amount of Honey gathered	Total value of Honey at 20c. per pound, plus value of increase at $7.00 per colony (not including hive)
			$ cts.
6	6	454	132 80
6		404	80 80

It will be noticed that the six divided colonies produced more honey than the six not divided. In an average summer this would not be so. There was, this season, little honey production during July and August because of the almost continuous wet weather during these months. The fall on the other hand was favourable for nectar secretion and the gathering of honey by the bees. The twelve colonies from the divided lot were able therefore because of these conditions to gather more honey during the favourable fall than the undivided ones.

TWO QUEEN SYSTEM

Two nuclei were placed in one hive that had a solid divsion down the centre to prevent the bees from intermingling. A special portico was placed at the entrance to provide for two openings. Each nucleus consisted of two frames of emerging brood with adhering bees, a frame of honey and a young queen. Two drawn frames were given each nucleus in order to fill up the rest of the space.

Four nuclei are being wintered in the above manner. The colonies containing the two queens can be wintered in the ordinary packing case, thus providing a surplus of young queens in spring. These can be introduced to colonies that have lost their queens during the winter or that have failing queens. If no extra queens are required, double colonies can be separated to make two colonies in the spring.

HONEY PRODUCTION FROM FRUIT BLOOM

Records have been kept of honey gathered during the apple blossom periods of 1919, 1920, 1921 and 1922. In 1919, seven days were favourable for bees to work in, three of these during the height of bloom. In 1920, nine days were favourable, but during the height of bloom three days were unfavourable because of dark damp weather; during these no honey was gathered. In 1921, seven days were favourable; on two other days there was rain. In 1922, the colonies on scales during the fruit bloom period showed an increase of weight on six days.

Year	Number of Colonies	Honey produced	Average per Colony	Period of Bloom
		Pounds	Pounds	
1919	21	701	33·4	May 25 to June 11
1920	32	184	5·8	" 28 " 15
1921	43	649	15·0	" 20 " 1
1922	41	156½	3·8	" 25 " 7

WINTER CARE

Twelve out of sixty-nine colonies are being wintered, 1922-23, on natural stores, the source of which is principally golden-rod and aster. Four of these colonies were given an additional shallow super of honey that they might be up to the required weight. The remaining fifty-seven, because of having a smaller amount of natural stores than the above, were fed sugar syrup. This consisted of two parts of sugar and one of water, by measure, and was fed to the bees in ten-pound, friction-top honey tins, before October 18. The amount to be fed the individual colonies was determined before feeding by weighing each colony. The average weight of the colonies after being fed was over sixty pounds.

COLONIES SOLD, ETC.

During the season, eleven colonies were sold, one colony only to each applicant. At least this number will be sold each season. In this way it is hoped to increase the number of colonies in the Valley and at the same time to improve the stock. It is also hoped to encourage better methods of beekeeping by selling bees in standard hives. One colony of bees was shipped to Scotland and arrived in good condition.

During the active season of beekeeping, assistance was given those that purchased bees from this Station as well as other beekeepers throughout the Valley.

GENERAL NOTES

EXHIBITIONS AND EXCURSIONS

The following exhibitions were attended and an exhibit made of farm produce at each:—

Lunenburg County, Bridgewater, N.S., September 26-28.
Kings, Hants and Annapolis Counties, Annapolis, N.S., October 4-6.
Halifax Poultry Show, Halifax, N.S., October 30-November 4.
Ideal Home Show, Halifax, N.S., November 13-16.

These exhibitions were all well attended and much interest was taken in the exhibit.

Several picnics were held during the summer. A number of agricultural meetings and picnics were attended and addressed during the year.