DOMINION OF CANADA

DEPARTMENT OF AGRICULTURE

DOMINION EXPERIMENTAL FARMS

EXPERIMENTAL STATION

KENTVILLE, N.S.

REPORT OF THE SUPERINTENDENT

W. SAXBY BLAIR, D.Sc.

FOR THE YEAR 1930

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DOMINION EXPERIMENTAL STATION
KENTVILLE, N.S.

REPORT OF THE SUPERINTENDENT, W. SAXBY BLAIR, D.Sc.

THE SEASON

January and February were slightly higher in temperature than usual, being each over 2 degrees above the average for the previous sixteen years; their precipitation was practically normal. January snowfall aggregated 16·2 inches, 9 inches of this falling between the 10th and 13th and the balance from the 21st to the 26th. The lowest temperature of the year, — 11 degrees, occurred on the 12th; the only other sub-zero temperature in January, — 3 degrees, was on the 24th. At no time during the month was the ground bare of snow nor covered too much to prevent the operating of automobiles. February recorded three days of sub-zero temperature: on the 4th and 12th, — 5; and on the 17th, — 2. The 23 inches of snow and 1·26 inches of rain continued a good snow covering, but of no great depth, throughout the month.

March was without zero temperatures and practically without a snowfall, only two light flurries of one-half inch each occurring during the month. The rainfall of 3·63 inches, accompanied by a high mean temperature and days of bright sunshine, removed the snow and left the fields bare at the end of the month. The absence of snow in the orchards at this time aided materially in pruning operations.

The frost was out of the ground and the first garden seeds planted April 2. Ploughing was possible on all soils by the end of the month.

There was very little rainfall during the first half of May, and this permitted early planting of grains and early spraying of orchards. The semi-dormant spray was applied from May 5 to 10. The pre-pink spray was applied from the 17th to the 24th. The latter part of the month was showery and colder, frosts occurring in some districts, but no serious damage resulting. The colder temperatures delayed the blossoming period. Cherries, plums, and pears were in full bloom about the 20th and suffered some injury from a frost of 2 degrees on the 23rd. The pink spray was completed on the 30th. Strawberries suffered some injury from a frost on May 30.

The mean temperature in June was 10·6 degrees higher, the sunshine 75·6 hours greater, and the precipitation 1·23 inches less than the corresponding averages for the preceding sixteen years. Rainfalls of 0·86 of an inch on the 1st and 2nd, with no further rains until the 18th, and between then and the 24th light showers aggregating 0·85 of an inch, were recorded. The rains were of material benefit to all crops but were insufficient, considering the high temperature, to meet crop requirements. Hay which in May promised well was checked and the yields reduced. Potatoes, roots, cereals, and pastures suffered materially, while small fruits lacked size and quality and were much reduced in yield. Apples bloomed sparsely in some orchards and heavily in others, but a fairly average bloom resulted. The blooming period was from May 29 to June 7. The calyx spray was applied from June 10 to 17. The after-calyx spray was applied from June 30 to July 8. Apple trees showed a heavy, healthy foliage, developed normally and were practically free of fungus diseases, and apparently suffered but little from drought.

The temperature and sunshine during July were almost normal and the precipitation slightly higher, being 3·71 inches against 2·97 inches, the previous 16-year average. With the exception og 0·01 of an inch, this rain fell during the first half of the month and was of great benefit to cereals, roots, potatoes, and pastures. Crops suffered again at the end of the month, particularly potatoes and roots. Cereals ripened rapidly; apples sized up well and were clean and well coloured. Sweet cherries matured prematurely and were only a fair crop; sour cherries were light due to the earlier frost injury to the blossoms. Raspberries were also light.

The precipitation in August was 2·07 inches, as compared with 3·3 inches, the previous 16-year average, the month being normal in other respects. August was an excellent harvest month, and hay and grain were harvested in excellent condition but with somewhat reduced yields. Apples did not size normally and were about ten days earlier in maturity. Crimson Beauty apples, the first to mature, were being harvested August 4. Plums were a light crop. Potatoes matured earlier, with somewhat reduced yields but of good quality. The first shipment was moved about the middle of the month. Pears were a good crop. Clapps Favourite were harvested on the 23rd. A few Gravenstein apples were being picked at the close of the month. Tomatoes and corn were the best harvested for some years. Celery was a failure due to the dry weather; peas and beans were good but with a much shortened season of use.

September was an ideal harvest month but very dry. Only 0·92 of an inch of rain fell, and this was distributed over nine days and was of little benefit to any crop. Field corn was good, grain turned out fairly well, potatoes were below the average but of excellent quality and free from rot, and mangels and turnips were below the average yield. All apples matured rapidly and were ten days ahead of the normal season.

Although rain aggregating 3·33 inches fell during October, it was below the previous 16-year average (4·13 inches) for this month. This rainfall was of little or no apparent benefit to the crops, but aided in fall ploughing and in augmenting the farm water supply. The month was about normal in temperature, but lacked the usual amount of sunshine. A heavy northeast gale occurred on the night of the 4th and continued throughout the day and night of the 5th, resulting in much damage to unharvested apples. This damage was accentuated by the fact that the fruit had matured faster than it could be harvested and that when the wind struck many varieties were mature and ready to be picked. The first frost of the autumn came on the 22nd. Practically all fruit was harvested at the close of the month.

November was a bright, open month with a light precipitation. Several severe frosts prevented ploughing for a brief period, but the freeze-up for the winter did not come until the close of the month. The first heavy fall of snow, 5½ inches, was on the 27th.

December was practically normal as to temperature and sunshine, but above the average in precipitation, the rainfall totalling 2·75 inches, which together with 22 inches of snow made a total precipitation equivalent to 4·95 inches of water. Light falls of snow throughout the month kept the ground coated with snow and a fall of 8 inches on the 23rd with 6·7 inches on the 27th and 28th gave an abundant covering at the close of the month.

METEOROLOGICAL RECORDS AT THE DOMINION EXPERIMENTAL STATION, KENTVILLE, N.S., FOR THE YEAR 1930

Month	Temperature (Fahrenheit)						Precipitation						Sunshine		
	Mean		Maximum		Minimum		Days on which rain fell	Total rainfall, 1930	Days on which snow fell	Total snowfall, 1930	Total precipitation, 1930	Average previous 16 years	Days of sunshine	1930	Average, previous 16 years
	1930	Average previous 16 years	Highest	Mean maximum	Lowest	Mean minimum									
	°	°	°	°	°	°		in.		in.	in.	in.		hr.	hr.
January	22·06	19·97	60	29·06	−11	15·06	6	1·51	10	16·25	3·14	3·80	20	81·9	78·39
February	21·64	19·43	48	29·46	− 5	13·82	6	1·26	7	23·00	3·56	3·22	21	101·3	98·58
March	31·08	28·84	58	38·10	4	24·06	11	3·63	2	1·00	3·73	2·88	27	155·9	133·29
April	39·28	38·85	64	48·63	16	29·93	10	1·57	1	0·25	1·60	2·84	25	189·8	151·66
May	49·52	49·63	81	61·16	25	37·87	10	1·61	.....	.....	1·61	2·50	29	197·6	198·78
June	69·49	58·89	92	81·86	34	57·13	9	1·71	.....	.....	1·71	2·94	30	287·7	212·07
July	67·27	65·78	88	78·48	41	56·06	12	3·71	.....	.....	3·71	2·97	31	223·9	223·98
August	64·32	64·28	85	76·26	41	52·39	11	2·07	.....	.....	2·07	3·30	31	214·5	210·29
September	59·37	57·05	84	69·37	33	49·37	9	0·92	.....	.....	0·92	2·88	27	189·3	177·04
October	48·49	47·93	83	56·97	25	40·00	12	3·33	.....	.....	3·33	4·13	21	99·3	143·50
November	37·43	36·77	65	46·03	13	28·73	7	1·09	3	6·25	1·74	3·79	28	120·3	85·30
December	26·21	25·25	56	31·9	2	20·52	10	2·75	9	22·00	4·95	2·04	21	57·4	57·70
Totals or averages	44·68	42·72	.....	53·94	.....	35·41	113	25·16	32	68·75	32·07	37·29	311	1,918·9	1,770·58

ANIMAL HUSBANDRY

CATTLE

DUAL-PURPOSE SHORTHORN HERD

The Shorthorn herd at the end of the year 1930 consisted of one herd bull, one yearling bull, twenty-two cows, twelve two-year-old heifers, eight yearling heifers and eight heifer calves, a total of fifty-two head. Ten bull calves and thirteen heifer calves were born during the year, and thirty-two cattle were disposed of. Five cows and one yearling heifer were sold for beef, and six cows, seven heifer calves and thirteen bull calves were sold for breeders. There were no deaths during the year and the general health of the cattle has been excellent. The demand for breeding stock has exceeded that of other years, and many inquiries have been referred to other breeders.

The feeding has been carried on much the same as in other years. The grain rations for the most part have been the home mixtures made up of wheat bran, ground oats, wheat middlings, corn meal, and oil meal. These feeds have been mixed to give a protein content of from 18 to 22 per cent, and the average cost for the year was $2.27 per hundred. Roots and ensilage are charged at $4 per ton and hay at $10. A generous proportion of Purina Cow Chow and Bulky Lass was fed during the summer and fall to the cattle being fitted for exhibition. The extra feed necessary for this work very materially increased the cost of milk production with the cows fitted for show.

The tabulated data show the feed consumption and the milk production of the twenty cows which completed lactation periods during the year. Eleven mature cows averaged 7,282 pounds of milk and 335 pounds of butter; four 4-year-olds, 5,741 pounds of milk and 261 pounds of butter; three 3-year-olds, 4,462 pounds of milk and 208 pounds of butter; and two 2-year-olds, 4,994 pounds of milk and 233 pounds of butter. The average production of the twenty cows and heifers was 6,322 pounds of milk and 291 pounds of butter. This is an average increase over the previous year of 1,195 pounds of milk and 52 pounds of butter. The average per cent of fat for the year was 3·91, a slight decrease of 0·06 per cent from last year.

The price of butter varied during the year 1930 from 41 cents per pound during the month of January to 29 cents per pound in the month of June. The average value of butter for the lactation periods tabulated was 36·96 cents per pound. Skim-milk is valued at 20 cents per hundred pounds.

AMOUNT AND VALUE OF MILK PRODUCED BY SHORTHORN COWS WHICH COMPLETED LACTATION PERIODS DURING THE YEAR ENDING DECEMBER 31, 1930

Name of cow	Age in years	Date of dropping calf	Number of days milking	Total milk	Daily average yield of milk	Average per cent fat	Butter produced	Value of butter	Value of skim milk	Total value of product
				lb.	lb.	%	lb.	$	$	$
Kentville Victoria 3rd	10	June 13, 1929	365	7,699·1	21·09	3·82	346·56	140 58	14 81	155 39
Kentville Lady	10	Nov. 3, 1929	386	11,406·3	29·55	4·07	546·67	200 84	21 88	222 72
Kentville Meadow Flower 2nd	10	Dec. 23, 1929	324	6,819·9	21·05	3·64	292·29	105 34	13 14	118 48
Kentville Jessamine 4th	10	April 1, 1930	274	7,082·4	25·85	3·74	311·98	101 27	13 63	114 90
Kentville Jessamine 6th	9	April 26, 1930	217	4,902·1	22·59	3·76	216·78	70 24	9 44	79 68
Kentville Victoria 6th	8	Jan. 5, 1930	278	8,434·4	30·34	3·70	367·38	140 97	16 24	157 21
Kentville Jessamine 12th	6	April 29, 1929	289	6,079·9	21·04	4·15	296·50	123 02	11 76	134 78
Kentville Jessamine 14th	6	May 5, 1929	259	6,205·7	23·96	3·72	271·74	113 38	11 95	125 33
Kentville Lady 4th	5	April 22, 1929	313	6,991·4	22·34	4·21	346·22	144 43	13 39	157 82
Kentville Fairy 6th	5	Jan. 14, 1930	283	8,476·0	29·95	4·01	399·91	138 64	16 27	154 91
Kentville Susan 11th	5	Feb. 19, 1930	241	6,001·1	24·90	4·15	292·98	97 94	11 04	108 98
Kentville Jessamine 17th	4	April 20, 1929	279	5,521·5	19·79	4·03	261·90	109 25	10 60	119 85
Kentville Fairy 8th	4	May 6, 1929	276	5,222·2	18·92	3·99	245·74	101 69	10 03	111 72
Kentville Jessamine 19th	4	Feb. 19, 1930	318	7,301·3	22·96	3·82	328·06	110 77	14 05	124 82
Kentville Meadow Flower 4th	4	Mar. 26, 1930	279	4,918·1	17·62	3·57	206·71	68 29	9 48	77 77
Kentville Victoria 18th	3	Feb. 16, 1930	235	5,708·2	24·29	3·91	263·05	88 59	10 97	99 56
Kentville Susan 14th	3	Feb. 13, 1930	260	5,129·8	19·73	4·10	247·68	83 78	9 84	93 62
Kentville Victoria 20th	3	Jan. 24, 1930	141	2,548·3	18·07	3·78	113·35	41 31	4 90	46 21
Kentville Jessamine 21st	2	Dec. 18, 1929	294	5,374·8	18·28	4·04	255·86	89 51	10 31	99 82
Kentville Meadow Flower 5th	2	Sept. 17, 1929	292	4,613·1	15·79	3·86	209·75	81 96	8 87	90 83
Total	.....	.....	5,603	126,435·6	.....	.....	5,821·11	2,151 80	242 60	2,394 40
Average	5·7	.....	280	6,321·8	22·57	3·91	291·05	107 59	12 13	119 72

AMOUNT AND COST OF FEED CONSUMED BY SHORTHORN COWS WHICH COMPLETED LACTATION PERIOD DURING 1930

Name of cow	Age in years	Date of dropping calf	Amount of meal consumed	Amount of ensilage and roots consumed	Amount of hay consumed	Amount of green feed consumed	Months on pasture	Total cost of feed	Cost to produce 100 pounds of milk	Cost to produce 1 pound of butter	Profit on one pound of butter skim-milk not considered	Profit on cow
			lb.	lb.	lb.	lb.		$	$	cts.	cts.	$
Kentville Victoria 3rd	10	June 13, 1929	3,280	16,625	5,846	2,510	.....	139 28	1 81	40·19	0·38	16 11
Kentville Lady	10	Nov. 3, 1929	5,067	16,415	5,910	1,260	3·5	189 31	1 66	34·63	2·11	33 41
Kentville Meadow Flower 2nd	10	Dec. 23, 1929	3,046	12,760	3,966	630	3·5	124 08	1 82	42·45	−6·41	−5 60
Kentville Jessamine 4th	10	April 1, 1930	3,412	14,650	4,362	.....	2·5	135 19	1 91	43·33	−10·87	−20 29
Kentville Jessamine 6th	9	April 26, 1930	3,060	12,710	4,236	.....	0·5	118 77	2 42	54·79	−22·39	−39 09
Kentville Victoria 6th	8	Jan. 5, 1930	3,945	17,835	6,076	1,260	3·0	165 49	1 96	45·05	−6·68	−8 28
Kentville Jessamine 12th	6	April 29, 1929	2,164	10,790	4,226	2,510	.....	93 76	1 54	31·62	9·87	41 02
Kentville Jessamine 14th	6	May 5, 1929	2,345	10,830	4,238	2,510	.....	97 52	1 57	35·88	5·84	27 81
Kentville Lady 4th	5	April 22, 1929	2,868	12,990	4,886	2,510	.....	117 78	1 69	34·02	7·70	40 04
Kentville Fairy 6th	5	Jan. 14, 1930	3,138	12,360	3,642	840	3·5	123 17	1 45	30·80	3·87	31 74
Kentville Susan 11th	5	Feb. 19, 1930	2,672	11,920	3,306	.....	3·5	107 92	1 80	36·84	−3·41	1 06
Kentville Jessamine 17th	4	April 20, 1929	2,182	10,030	3,998	2,510	.....	91 54	1 66	34·95	6·76	28 31
Kentville Fairy 8th	4	May 6, 1929	2,260	9,750	3,914	2,510	.....	93 02	1 78	37·85	3·53	18 70
Kentville Jessamine 19th	4	Feb. 19, 1930	3,146	17,470	5,770	1,260	6·5	146 69	2 01	44·71	−10·95	−21 87
Kentville Meadow Flower 4th	4	Mar. 26, 1930	2,408	11,935	3,678	.....	3·5	105 13	2 14	50·86	−17·82	−27 36
Kentville Victoria 18th	3	Feb. 16, 1930	2,915	9,785	2,982	.....	3·5	108 89	1 91	41·40	−7·72	−9 33
Kentville Susan 14th	3	Feb. 13, 1930	2,896	10,615	3,456	.....	0·5	107 79	2 10	43·52	−9·70	−14 17
Kentville Victoria 20th	3	Jan. 24, 1930	1,407	9,765	3,176	840	.....	69 80	2 74	61·58	−25·13	−23 59
Kentville Jessamine 21st	2	Dec. 18, 1929	2,058	9,860	2,536	.....	2·5	88 61	1 65	34·63	0·35	11 21
Kentville Meadow Flower 5th	2	Sept. 17, 1929	2,054	10,685	3,204	360	0·5	88 17	1 91	42·04	−2·96	2 66
Total	.....	.....	56,313	249,780	83,418	21,510	36·5	2,311 91	.....	.....	.....	82 49
Average	5·7	.....	2,816	12,489	4,171	1,076	1·8	115 60	1 83	39·72	−2·75	4 12

RECORD OF PERFORMANCE

As is usual, all normal cows and heifers were entered for Record of Performance testing. Fourteen qualified in 1930 with an average production of 7,017·5 pounds of milk and 275·06 pounds of fat. These records were all made on twice-a-day milking under average farm conditions.

RECORD OF PERFORMANCE

Name of cow	Age	Number of days milking	Milk produced	Fat produced	Average per cent fat
	yr.		lb.	lb.	
Kentville Victoria 3rd	10	365	7,699·1	294·58	3·82
Kentville Lady	10	386	11,406·3	464·67	4·07
Kentville Meadow Flower 2nd	10	324	6,819·9	248·45	3·64
Kentville Victoria 6th	8	278	8,434·4	312·27	3·70
Kentville Jessamine 14th	6	259	6,205·7	230·98	3·72
Kentville Lady 4th	5	313	6,991·4	294·29	4·21
Kentville Fairy 6th	5	283	8,476·0	339·92	4·01
Kentville Susan 11th	5	241	6,001·1	249·03	4·15
Kentville Jessamine 17th	4	279	5,521·5	222·62	4·03
Kentville Fairy 8th	4	276	5,222·2	208·88	3·99
Kentville Jessamine 19th	4	318	7,301·3	278·85	3·82
Kentville Victoria 18th	3	235	5,708·2	223·59	3·91
Kentville Jessamine 21st	2	294	5,374·8	217·48	4·04
Kentville Jessamine 4th	10	274	7,082·4	265·18	3·74
Average	6·1	295	7,017·5	275·06	3·92

REARING YOUNG STOCK

Nearly all the calves at this Station are pail-fed. The new-born calf is allowed to remain with the mother for two days to ensure a safe start, and is then taught to drink. They are allowed from nine to twelve pounds of whole milk per day at three feeds until they are from six to seven weeks old, when they are gradually changed to skim-milk. The calf is allowed hay at an early age, and taught to eat grain when four or five weeks old. The skim-milk feeding is continued as long as the milk is available, often till the calf is over six months of age.

Young calves are not pastured, but after nine months of age they will do well on good pasture. All heifers are fed sufficient hay, meal, roots and ensilage to keep them in good growing condition, and are well cared for during the stabling period. The pasture season for young stock should be as long as possible, as this is the least expensive period, but they should not be allowed to lose flesh before stabling in the fall.

Tabulated data are given below recording the amount of feed eaten, and costs, for four different periods from birth to calving. The average length of this period for the twenty-seven heifers is 977 days, and the average cost has been $115.68.

A few other feed records have been kept of calves reared by suckling the cow, and of others fed on whole milk. In comparing these with the calves reared on skim-milk it will se seen that the costs for the first six months are more than double the costs of those that are fed skim-milk. While these may be better calves at six months of age they rarely make better two-year-olds, which leads to the conclusion that unless one can realize fancy prices for young stock it will not pay to rear calves on whole milk or by suckling the cow.

The following prices were charged in estimating the different costs: suckling the cow charged at 25 cents per day; whole milk, $1.75 per cwt.; skim-milk, 20 cents per cwt.; meal, $2.20 per cwt.; hay, $8 per ton; roots, ensilage, and green feed, each $4 per ton; pasture for young stock, $1, and for stock over two years old, $2 per month.

FEED CONSUMED BY HEIFERS FROM BIRTH TO SIX MONTHS, AND COSTS

Name	Date of birth	Whole milk	Skim milk	Meal	Hay	Roots	Cost
		lb.	lb.	lb.	lb.	lb.	$
Kentville Victoria 17th	Dec. 8, 1925	800	1,953	236	308	192	24 71
Kentville Meadow Flower 4th	Jan. 9, 1926	676	2,338	297	413	189	25 07
Kentville Jessamine 20th	Mar. 21, 1926	391	2,650	336	511	.....	21 57
Kentville Primrose 7th	Aug. 12, 1926	420	2,359	364	357	780	23 07
Kentville Victoria 18th	Aug. 19, 1926	336	2,562	378	385	850	22 56
Kentville Susan 14th	Aug. 21, 1926	312	2,562	399	378	900	22 67
Kentville Victoria 20th	Dec. 26, 1926	399	2,422	284	343	478	20 46
Kentville Jessamine 21st	Dec. 27, 1926	443	2,352	294	329	478	21 20
Kentville Susan 15th	Jan. 6, 1927	392	2,429	315	357	478	21 04
Kentville Jessamine 22nd	Jan. 10, 1927	392	2,429	315	357	478	21 04
Kentville Meadow Flower 5th	Jan. 26, 1927	440	2,494	245	301	100	19 48
Kentville Primrose 8th	Feb. 23, 1927	504	2,415	273	287	.....	20 81
Kentville Lady 6th	April 12, 1927	348	2,525	217	317	.....	17 18
Kentville Victoria 21st	Aug. 14, 1927	420	2,373	182	168	650	18 07
Kentville Susan 16th	Sept. 1, 1927	420	2,352	175	203	635	17 98
Kentville Victoria 22nd	Jan. 20, 1928	459	2,257	252	217	.....	18 95
Kentville Meadow Flower 6th	Jan. 25, 1928	459	2,257	252	217	.....	18 95
Kentville Fairy 9th	Feb. 2, 1928	646	1,711	210	203	.....	20 16
Kentville Primrose 9th	Feb. 11, 1928	536	2,131	217	203	.....	19 22
Kentville Jessamine 23rd	Feb. 11, 1928	536	2,131	217	203	.....	19 22
Kentville Jessamine 24th	Feb. 20, 1928	676	1,948	199	189	.....	20 87
Kentville Jessamine 25th	Mar. 2, 1928	668	2,205	209	217	.....	21 57
Kentville Susan 17th	Mar. 3, 1928	660	2,205	210	210	.....	21 42
Kentville Jessamine 26th	Mar. 10, 1928	834	1,974	230	238	.....	24 56
Kentville Victoria's Lily	Mar. 10, 1928	834	1,805	230	238	.....	24 22
Kentville Susan 18th	April 9, 1928	468	1,858	259	266	.....	18 67
Kentville Lady 7th	April 11, 1928	428	1,858	259	266	.....	17 97
Kentville Jessamine 27th	April 17, 1928	364	1,995	266	238	.....	17 16
Kentville Jessamine 28th	April 17, 1928	364	1,995	266	238	.....	17 16
Kentville Jessamine 29th	Oct. 10, 1928	1,067	1,050	161	273	645	26 69
Kentville Primrose 10th	Feb. 16, 1929	1,040	1,589	196	140	.....	26 25
Kentville Jessamine 30th	Feb. 18, 1929	1,016	1,589	196	140	.....	25 83
Kentville Meadow Flower 7th	Mar. 31, 1929	704	2,275	266	224	.....	23 62
Kentville Fairy 10th	April 12, 1929	520	2,404	330	259	.....	22 21
Kentville Jessamine 31st	April 20, 1929	396	2,583	343	273	.....	20 74
Kentville Victoria 25th	April 18, 1929	420	2,583	332	301	140	21 30
Kentville Fairy 11th	May 6, 1929	952	1,722	238	161	.....	25 98
Kentville Victoria 26th	June 13, 1929	1,270	1,386	308	168	260	32 96
Kentville Meadow Flower 8th	Sept. 17, 1929	764	1,906	238	168	574	24 24
Kentville Fairy 12th	Jan. 14, 1930	756	2,037	287	189	.....	24 37
Kentville Susan 20th	Feb. 13, 1930	504	2,478	364	238	.....	22 74
Kentville Victoria 29th	Feb. 16, 1930	468	2,541	357	182	.....	21 85
Kentville Susan 21st	Feb. 19, 1930	444	2,373	280	140	.....	19 14
Kentville Meadow Flower 9th	Mar. 26, 1930	652	2,410	306	252	140	24 25
Kentville Jessamine 34th	April 26, 1930	1,294	1,428	205	210	175	31 21
Total	.....	26,892	96,899	11,993	11,475	8,142	990 49
Average	.....	598	2,153	266	255	181	22 01

FEED CONSUMED BY BULLS FROM BIRTH TO SIX MONTHS, AND COSTS

Name	Date of birth	Whole milk	Skim milk	Meal	Hay	Roots	Cost
		lb.	lb.	lb.	lb.	lb.	$
Kentville Major General	April 29, 1926	462	2,334	217	371	.....	19 01
Kentville Dairy Prince	May 11, 1926	470	2,356	266	416	190	20 83
Kentville Proud Duke	July 11, 1926	471	2,142	259	315	440	20 36
Kentville Premier	Aug. 31, 1926	336	2,619	224	223	.....	16 94
Kentville White Duke	Sept. 22, 1926	430	2,358	112	224	255	16 12
Kentville Prince George	Nov. 4, 1926	420	2,436	182	322	630	18 77
Kentville Major	Nov. 5, 1926	420	2,562	203	273	705	19 44
Kentville Morning Star	Nov. 6, 1926	420	2,434	182	322	630	18 77
Kentville Sultan	Dec. 14, 1926	494	2,205	187	266	634	19 50
Kentville Hero	Jan. 2, 1927	392	2,436	280	294	634	20 34
Kentville Prince	Feb. 2, 1927	352	2,507	308	343	450	20 22
Kentville Star	Feb. 2, 1927	352	2,507	280	343	350	19 40
Kentville Captain	Mar. 10, 1927	420	2,709	301	273	.....	20 48
Kentville Monarch	Mar. 26, 1927	304	2,549	273	266	.....	17 49
Kentville Leader	April 2, 1927	268	2,549	336	343	.....	18 55
Kentville Laddie	April 12, 1927	348	2,505	217	315	.....	17 13
Kentville May's Major	May 24, 1927	358	1,974	392	364	.....	20 30
Kentville Beefy	July 26, 1927	522	1,239	175	182	.....	16 20
Kentville Billy	July 30, 1927	564	1,554	182	189	.....	17 74
Total	.....	7,803	43,975	4,756	5,644	4,918	357 59
Averages	.....	411	2,314	241	297	259	18 83

CALVES SUCKLED—FEED CONSUMED BY CALVES FROM BIRTH TO SIX MONTHS (OR SALE), AND COSTS

Name	Date of birth	Days nursing cow	Meal	Hay	Roots	Cost
			lb.	lb.	lb.	$
Kentville Victor	Aug. 27, 1926	183	259	280	720	54 01
Kentville Susan's Denis	Aug. 23, 1928	102	42	.....	.....	26 42
Kentville Victor 5th	Dec. 5, 1929	29	.....	.....	.....	7 25
Kentville Victoria 9th	Aug. 27, 1926	183	.....	.....	.....	45 75
Kentville Victoria 23rd	Aug. 24, 1928	183	147	147	275	50 12
Kentville Duke 3rd	Oct. 21, 1929	182	217	147	300	51 46
Total	.....	862	665	574	1,295	235 01
Average	.....	143·6	111	96	216	39 17

CALVES FED WHOLE MILK—FEED CONSUMED BY HEIFERS FROM BIRTH TO SIX MONTHS, AND COSTS

Name	Date of birth	Whole milk	Meal	Hay	Roots	Cost
		lb.	lb.	lb.	lb.	$
Kentville Victoria 16th	Sept. 1, 1925	2,136	185	217	305	42 93
Kentville Roan Lad	April 27, 1927	2,247	294	336	140	47 41
Total	.....	4,383	479	553	445	90 34
Average	.....	2,191·5	239	276	222	45 17

FEED CONSUMED BY HEIFERS FROM SIX MONTHS TO ONE YEAR, AND COSTS

Name	Year	Skim-milk	Meal	Hay	Roots and ensilage	Green feed	Pasture	Cost
		lb.	lb.	lb.	lb.	lb.	mo.	$
K. Lady Maud	1925-26	521	637	1,043	1,155	300	.....	22 13
K. Fairy 8th	1925-26	542	546	868	1,405	150	.....	19 67
K. Jessamine 18th	1925-26	542	546	868	1,405	150	.....	19 67
K. Victoria 15th	1925-26	.....	546	980	1,855	.....	.....	19 64
K. Jessamine 19th	1925-26	.....	546	980	1,855	.....	.....	19 64
K. Susan 12th	1925-26	1,137	512	791	1,052	.....	.....	18 79
K. Victoria 16th	1925-26	944	574	970	625	.....	.....	19 69
K. Victoria 17th	1926	1,828	546	1,095	670	.....	.....	21 39
K. Meadow Flower 4th	1926-27	1,827	630	1,183	1,050	.....	.....	24 34
K. Jessamine 20th	1926-27	.....	504	1,029	2,040	.....	.....	19 29
K. Primrose 7th	1927	414	357	476	1,610	.....	2	15 80
K. Victoria 18th	1927	414	357	476	1,610	.....	2	15 80
K. Susan 14th	1927	267	336	448	1,540	.....	1	13 79
K. Victoria 19th	1927	.....	315	420	1,470	.....	.....	11 55
K. Victoria 20th	1927	797	546	1,174	1,590	.....	.....	21 48
K. Jessamine 21st	1927	797	567	1,320	1,770	.....	.....	22 88
K. Susan 15th	1927-28	650	567	1,360	2,090	.....	.....	23 39
K. Jessamine 22nd	1927-28	650	567	1,360	2,090	.....	.....	23 39
K. Meadow Flower 5th	1927-28	1,311	665	812	1,510	.....	.....	23 52
K. Primrose 8th	1927-28	723	749	896	2,120	.....	.....	25 75
K. Lady 6th	1927-28	.....	875	861	2,960	.....	.....	28 61
K. Victoria 21st	1928	2,184	357	455	1,010	.....	1	17 06
K. Susan 16th	1928	1,890	315	420	870	.....	1	15 13
K. Victoria 22nd	1928-29	.....	658	720	970	.....	.....	19 30
K. Meadow Flower 6th	1928-29	.....	662	724	980	.....	.....	19 42
K. Fairy 9th	1928-29	.....	672	724	1,155	.....	.....	19 99
K. Primrose 9th	1928-29	378	679	700	1,260	.....	.....	21 02
K. Jessamine 23rd	1928-29	378	679	700	1,260	.....	.....	21 02
K. Jessamine 24th	1928-29	305	686	714	1,400	.....	.....	21 36
K. Jessamine 25th	1928-29	325	700	742	1,670	.....	.....	22 36
K. Susan 17th	1928-29	325	700	742	1,670	.....	.....	22 36
K. Jessamine 26th	1928-29	200	686	721	1,785	.....	.....	21 94
K. Victoria's Lily	1928-29	200	686	721	1,785	.....	.....	21 94
K. Susan 18th	1928-29	.....	658	707	2,140	.....	.....	21 59
K. Lady 7th	1928-29	.....	672	772	2,485	.....	.....	22 84
K. Jessamine 27th	1928-29	.....	644	548	2,380	.....	.....	21 12
K. Jessamine 28th	1928-29	.....	644	548	2,380	.....	.....	21 12
K. Victoria 23rd	1929	.....	400	511	2,100	.....	2	17 04
K. Jessamine 29th	1929	.....	195	315	1,300	.....	4	12 15
K. Primrose 10th	1929-30	785	686	634	1,890	.....	.....	22 98
K. Jessamine 30th	1929-30	791	686	630	1,890	.....	.....	22 97
K. Meadow Flower 7th	1929-30	126	700	628	2,650	.....	.....	23 46
K. Fairy 10th	1929-30	.....	728	707	2,960	.....	.....	24 77
K. Victoria 25th	1929-30	.....	720	725	2,900	.....	.....	24 54
K. Jessamine 31st	1929-30	.....	720	725	2,900	.....	.....	24 54
K. Fairy 11th	1929-30	880	651	707	3,240	.....	.....	25 39
K. Victoria 26th	1929-30	378	707	831	4,050	.....	.....	27 73
K. Meadow Flower 8th	1930	2,520	959	680	1,950	.....	.....	32 76
K. Fairy 12th	1930	2,772	1,099	708	770	.....	.....	34 09
Total		27,801	29,837	37,878	87,272	600	13	1,052 20
Average		567	609	773	1,781	12	27	21 47

FEED CONSUMED BY HEIFERS FROM ONE YEAR TO TWO YEARS, AND COSTS

Name	Year	Meal	Hay	Roots and ensilage	Green feed	Pasture	Cost
		lb.	lb.	lb.	lb.	mo.	$
K. Victoria 11th	1925-26	819	1,636	4,130	.....	4	36 82
K. Susan 10th	1925-26	791	1,768	4,305	.....	4	37 08
K. Victoria 12th	1925-26	777	1,768	4,290	.....	4	36 74
K. Fairy 6th	1925-26	651	1,722	4,165	.....	4	33 54
K. Jessamine 15th	1925-26	714	1,904	4,795	.....	4	36 92
K. Victoria 13th	1925-26	714	1,932	4,900	.....	4	37 24
K. Jessamine 16th	1925-26	693	1,778	4,620	.....	4	35 60
K. Fairy 7th	1925-26	693	1,778	4,620	.....	4	35 60
K. Susan 11th	1925-26	714	1,989	4,265	.....	4	36 20
K. Victoria 14th	1925-26	729	2,038	4,265	.....	4	36 72
K. Jessamine 17th	1925-26	813	1,970	3,190	.....	4	36 15
K. Lady 5th	1925-26	813	1,970	3,190	.....	4	36 15
K. Lady Maud	1926	792	1,986	3,280	.....	4	35 92
K. Fairy 8th	1926-27	792	2,154	3,600	280	2	35 80
K. Jessamine 18th	1926-27	792	2,154	3,600	280	2	35 80
K. Victoria 15th	1926-27	834	2,396	3,980	.....	2	37 89
K. Jessamine 19th	1926-27	834	2,396	3,980	.....	2	37 89
K. Susan 12th	1926-27	1,029	2,552	4,860	.....	.....	42 57
K. Victoria 16th	1926-27	863	2,184	4,810	.....	2	39 35
K. Victoria 17th	1926-27	714	1,988	5,570	.....	2	36 80
K. Meadow Flower 4th	1926-27	882	2,156	6,420	.....	2	42 86
K. Jessamine 20th	1927-28	1,029	2,282	7,050	.....	2	47 87
K. Victoria 18th	1927-28	1,267	1,962	5,450	.....	2	48 62
K. Susan 14th	1927-28	749	1,960	5,890	.....	2	38 10
K. Victoria 20th	1927-28	1,120	2,072	5,330	.....	2	45 59
K. Jessamine 21st	1927-28	1,120	2,072	5,070	.....	2	45 07
K. Susan 15th	1928	1,099	2,016	5,080	.....	2	44 40
K. Meadow Flower 5th	1928-29	1,379	1,813	4,200	.....	2	47 99
K. Victoria 21st	1928-29	875	1,848	5,320	.....	3	40 28
K. Fairy 9th	1929-30	842	1,503	5,345	.....	3·5	38·72
K. Jessamine 24th	1929-30	828	1,519	4,280	.....	3 5	36 36
K. Jessamine 25th	1929-30	842	1,554	5,590	.....	3·5	39 42
K. Susan 17th	1929-30	842	1,554	5,590	.....	3·5	39 42
K. Jessamine 26th	1929-30	849	1,330	5,820	.....	3·5	39 14
K. Victoria's Lily	1929-30	849	1,330	5,820	.....	3·5	39 14
K. Susan 18th	1929-30	878	1,673	5,820	.....	3·5	41 15
K. Lady 7th	1929-30	878	1,673	5,820	.....	3·5	41 15
K. Jessamine 27th	1929-30	860	1,680	5,800	.....	3·5	40 74
K. Jessamine 28th	1929-30	860	1,680	5,800	.....	3·5	40 74
K. Victoria 23rd	1929-30	920	1,792	6,560	.....	4	44 53
K. Jessamine 29th	1929-30	1,011	2,072	7,120	.....	.....	44 77
Total	.....	35,550	77,604	203,590	560	122	1,622 84
Average	.....	867·1	1,892·8	4,965·6	14	2·98	39 58

FEED CONSUMED BY HEIFERS FROM TWO YEARS TO CALVING, AND COSTS

Name	Year	Meal	Hay	Roots and ensilage	Green feed	Pasture $2	Days fed	Cost
		lb.	lb.	lb.	lb.	mo.		$
K. Susan 9th	1925-26	666	1,170	4,180	.....	3	209	33 69
K. Primrose 5th	1925-26	687	2,432	6,820	.....	2	302	42 48
K. Lady 4th	1925-26	525	1,400	4,090	.....	.....	172	25 33
K. Primrose 6th	1925-26	540	1,984	5,095	.....	1·5	233	33 01
K. Victoria 11th	1926	477	1,424	3,175	.....	2	220	26 54
K. Susan 10th	1926	456	1,424	3,300	.....	2	242	26 33
K. Victoria 12th	1926	504	1,456	3,245	.....	3	280	29 40
K. Fairy 6th	1926	477	1,562	3,065	.....	3	259	28 87
K. Victoria 13th	1926	309	974	1,510	.....	3	203	19 72
K. Jessamine 16th	1926	435	1,456	3,480	.....	3	248	28 35
K. Fairy 7th	1926	383	1,326	3,090	.....	3	230	25 91
K. Susan 11th	1926-27	400	1,512	3,390	280	1·5	232	25 19
K. Victoria 14th	1926-27	777	2,828	6,505	280	1·5	381	44 97
K. Jessamine 17th	1927-28	1,144	3,654	9,785	.....	1·5	449	62 36
K. Fairy 8th	1927-28	1,218	3,122	8,460	.....	1·5	396	59 21
K. Jessamine 18th	1927-28	1,092	2,870	7,710	.....	1·5	370	53 92
K. Victoria 15th	1927-28	1,092	2,702	7,480	.....	1·5	348	52 79
K. Jessamine 19th	1927-28	966	2,484	7,230	.....	1·5	346	48 65
K. Susan 12th	1927-28	735	1,512	4,780	.....	1·5	238	34 78
K. Victoria 16th	1927-28	588	1,442	4,530	.....	1	182	29 77
K. Meadow Flower 4th	1928	378	630	2,250	.....	.....	53	15 34
K. Jessamine 20th	1928	427	882	1,050	.....	3	203	21 02
K. Victoria 18th	1928-29	588	896	1,960	.....	1	168	22 44
K. Susan 14th	1928-29	651	1,008	2,240	.....	1	161	24 83
K. Victoria 20th	1928-29	63	168	420	.....	.....	25	2 90
K. Jessamine 21st	1929	504	1,652	5,670	.....	4·5	356	38 04
K. Victoria 21st	1929	388	928	3,110	.....	2	169	22 47
Total	.....	16,470	44,898	117,620	560	50	6,675	878 31
Average	.....	610	1,663	4,356	20·7	1·8	247	32 53

AVERAGE COST OF HEIFERS FROM BIRTH TO CALVING

The average amount of feeds consumed from birth to calving by the various lots of heifers is given in the table following.

Age	Number of heifers	Whole milk	Skim milk	Meal	Hay	Roots and ensilage	Green feed	Pasture
		lb.	lb.	lb.	lb.	lb.	lb.	mos.
Birth to six months	45	598	2,153	266	255	181	.....	.....
Six months to one year	49	.....	567	609	773	1,781	12	0 27
One year to two years	41	.....	.....	867	1,893	4,965	14	2 98
Two years to calving	27	.....	.....	612	1,668	4,371	21	1 85
Total	.....	598	2,720	2,354	4,589	11,298	47	5 10

The average cost for the period was:—

598	pounds of whole milk at	$1.75	cwt	$ 10 47
2,720	" skim milk at	0 20	"	5 44
2,354	" meal at	2.20	"	51 79
4,589	" hay at	0.40	"	18 36
11,297	" roots and ensilage at	0.20	"	22 59
47	" green feed at	0.20	"	0 09
5·1 months pasture				6 94
Average cost of feed for heifer from birth to calving				$ 115 68

THE FEEDING VALUE OF DEHYDRATED APPLE POMACE

The object of this experiment was to ascertain the feeding value of dehydrated apple pomace, the by-product of apple dehydration and cider mills.

Two lots of dual-purpose Shorthorn cows in fairly equal stages of lactation were fed on the following rations in three-week periods.

—	Group 1	Group 2
Period 1	Regular meal mixture (No. 1).	Special meal mixture (No. 2), 75 p.c. Apple pomace, 25 p.c.
Period 2	Special meal mixture (No. 2), 50 p.c. Apple pomace, 50 p.c.	Regular meal mixture (No. 1).
Period 3	Regular meal mixture (No. 1).	Special meal mixture (No. 2), 75 p.c. Apple pomace, 25 p.c.

Roughage consisting of silage and hay was the same for both groups throughout all periods. The meal and apple pomace were kept separate, and were fed at the same time on the silage. The apple pomace was eaten readily by all the cows at all times. The cows were fed and milked twice daily.

MEAL MIXTURES

Feed	Regular meal mixture (No. 1)	Special meal mixture (No. 2) with 50 p.c. apple pomace	Special meal mixture (No. 2) with 25 p.c. apple pomace
	lb.	lb.	lb.
Bran	200	100	100
Oats	200	50	50
Corn	200	—	—
Oil meal	300	300	300
Apple pomace	—	450	150

The analyses of these feeds as supplied by the Dominion Chemist were as follows:—

DETAILS OF ANALYSES

Ingredients	Regular meal mixture (No. 1)	Special meal mixture (No. 2)	Apple pomace
Moisture	9·57	8·83	10·77
Protein (N x 6·25)	20·97	28·97	4·07
Fat	6·33	7·85	2·57
Carbohydrates	50·79	40·97	66·61
Fibre	8·07	8·10	14·13
Ash	4·45	5·28	1·83
	100·00	100·00	100·00

In working out the above meal, and meal and apple pomace rations the endeavour was made to keep the nutritive ratios as nearly the same as possible. This was done by having the apple pomace replace the carbohydrate portion of the meal mixture.

The following tables give the data obtained in these feeding trials:—

THE FEEDING VALUE OF DEHYDRATED APPLE POMACE—RESULTS, GROUP 1

Item	Period 1 Meal No. 1, silage, hay	Period 2 Meal No. 2, silage, hay, apple	Period 3 Meal No. 1, silage, hay	Average of periods 1 and 3
Number of cows in experiment	3	3	3	
Duration of test.....days	21	21	21	
Milk produced in last 14 days..... lb.	1,143·8	977·8	925·5	1,035·0
Total fat produced..... lb.	46·38	40·24	38·00	42·19
Total fat corrected milk produced..... lb.	1,153·20	994·7	940·2	1,047·0
Total meal consumed at $35 per ton..... lb.	420·0	.....	336·0	378·0
Total meal consumed at $39 per ton..... lb.	.....	196·0	.....	.....
Total long hay consumed at $8 per ton..... lb.	504·0	504·0	504·0	504·0
Total silage consumed at $4 per ton..... lb.	1,680·0	1,680·0	1,680·0	1,680·0
Total apple consumed at $40 per ton..... lb.	.....	196·0	.....	.....
Cost of apple fed..... $	.....	3 92	.....	.....
Cost of meal fed..... $	7 35	3 72	5 88	6 62
Cost of hay fed..... $	2 01	2 01	2 01	2 01
Cost of silage fed..... $	3 36	3 36	3 36	3 36
Total cost of feed..... $	12 72	13 01	11 25	11 99
Feed cost to produce 100 pounds fat corrected milk $	1 10	1 31	1 20	1 15
Profit over feed, fat corrected milk at $1.75 per cwt..... $	7 46	4 40	5 20	6 33
Weight of cows at start of period..... lb.	4,060	3,985	3,935	3,998
Weight of cows at finish of period..... lb.	3,985	3,935	3,945	3,965
Gain or loss in weight..... lb.	−75	−50	10	−33

THE FEEDING VALUE OF DEHYDRATED APPLE POMACE—RESULTS, GROUP II

Item	Period 1 Meal No. 2, silage, hay, apple	Period 2 Meal No. 1, silage, hay	Period 3 Meal No. 2, silage, hay, apple	Average of periods 1 and 3
Number of cows in experiment	3	3	3	
Duration of test.....days	21	21	21	
Milk produced last 14 days..... lb.	1,281·3	1,272·3	1,172·0	1,226·6
Total fat produced..... lb.	45·91	47·84	43·66	44·78
Total fat corrected milk produced..... lb.	1,201·1	1,226·5	1,123·7	1,162·4
Total meal consumed at $35 per ton..... lb.	.....	434	.....	.....
Total meal consumed at $39 per ton..... lb.	336	.....	315	326
Total long hay consumed at $8 per ton..... lb.	504	504	504	504
Total silage consumed at $4 per ton..... lb.	1,680	1,680	1,680	1,680
Total apple consumed at $40 per ton..... lb.	112	.....	105	109
Cost of apple fed..... $	2 24	.....	2 10	2 17
Cost of meal fed..... $	6 38	7 59	5 99	6 19
Cost of hay fed..... $	2 01	2 01	2 01	2 01
Cost of silage fed..... $	3 36	3 36	3 36	3 36
Total cost of feed..... $	13 99	12 96	13 46	13 73
Feed cost to produce 100 pounds fat corrected milk $	1 16	1 06	1 20	1 18
Profit over feed, fat corrected milk at $1.75 per cwt..... $	7 03	8 50	6 20	6 61
Weight of cows at start of period..... lb.	3,755	3,730	3,775	3,765
Weight of cows at finish of period..... lb.	3,730	3,775	3,750	3,740
Gain or loss in weight..... lb.	−25	45	−25	−25

The conclusions to be drawn from these trials are that dehydrated apple pomace, at $40 per ton, will not economically replace other carbohydrates in the meal ration as supplied through corn and mill feeds. It will be seen that the shrinkage in milk was marked in the periods when apple pomace was fed, that the feed cost of fat corrected milk per hundredweight was increased, and that there was a greater loss of weight in the cows during the periods when apple pomace was fed.

In group number one 378 pounds of meal mixture No. 1 proved to be equal to 206·5 pounds of meal mixture No. 2 plus 27 pounds of hay, 91 pounds of silage, and 206·5 pounds of apple pomace, giving the apple pomace a cash value

of $22.40 per ton, with other feeds at the prices charged. In the second group, when less apple pomace was fed, 434 pounds of meal mixture No. 1 was found to equal 342·8 pounds of meal mixture No. 2, plus 27 pounds of hay, 91 pounds of silage, and 114·9 pounds of apple pomace, giving the apple pomace a cash value of $10.80 per ton, with other feeds at the prices charged.

SWINE

The swine on hand January 1, 1930, numbered twelve, consisting of one herd boar, five breeding sows and six young boar pigs. Early in January these young boars were sold, leaving the six breeders for the year's work. Five litters were farrowed in the spring with a total of 57 pigs. Thirty-seven were raised to weaning age, an average of 7·4 pigs per sow. Three fall litters were farrowed with a total of 39 pigs. Twenty-eight were raised to weaning age, an average of 9·3 pigs per sow. From the 8 litters farrowed during the year 65 pigs were raised, an average of 8·1 pigs per litter. Forty-nine pigs from those litters were sold: 28 for breeders, 12 for feeders and 9 for bacon. There were on hand at the end of the year one herd boar, five breeding sows, one small boar and 15 feeders, a total of twenty-two.

One sow, Kentville Rose's Lass, qualified in the advanced Registry Policy for Swine.

The meal mixture for the breeding hogs was made up of 200 pounds wheat middlings, 100 pounds ground oats, 100 pounds wheat bran, 25 pounds tankage and 4 pounds salt. The average cost per hundred pounds was $2.20. Apples and mangels were fed during the year, except in the summer months, when the sows were out on pasture. The apples and mangels were charged at 20 cents per cwt., and the pasture at 50 cents per month.

The following table shows the feed consumption and costs of the mature breeding swine for the year:—

FEED CONSUMED BY MATURE BREEDING SWINE DURING THE YEAR 1930

Item	Herd boar	Kentville Bonnie	Kentville Rose	Kentville Rose's Princess	Kentville Rose's Beauty	Kentville Rose's Lass
Age.....years	2	5·5	6	2	2	2
Number of days fed.....	365	365	365	365	365	365
Total meal eaten (at $2.20 per cwt.) lb.	1,260	1,309	1,036	1,330	952	1,358
Average meal eaten per day..... lb.	3·45	3·58	2·84	3·64	2·61	3·72
Total mangels eaten (at $4 per ton). lb.	1,925	1,974	1,939	1,960	1,855	1,960
Total apples eaten (at $4 per ton)... lb.	1,180	455	770	475	840	475
Total skim milk eaten (at 20 cts. per cwt.)..... lb.	581	5,616	5,073	5,449	4,327	5,502
Months on pasture (at 50 cts. per month).....		3	3	3	3	3
Total cost of feed..... $	35 09	46 39	39 86	46 53	37 48	47 25
Average cost per day.....cts.	9·6	12·7	10·9	12·7	10·3	12·9

COST OF PORK PRODUCTION

Ten Yorkshire pigs were fed for 126 days, and fitted for the bacon market. These pigs were from two litters and were fed in the slaughter test of the Advanced Registry Policy for Swine. The following data relative to the cost of producing bacon hogs were obtained:—

COST OF PORK PRODUCTION

Value of 10 pigs at beginning of test at $5 each	$	50 00
10,206 pounds of skim-milk at 20 cents per cwt.	$	20 41
4,610 pounds of meal at $2.25 per cwt.	$	103 73
Total cost of 10 pigs	$	174 14
Total sale value of 10 pigs	$	223 64
Profit over feed and weaning value of pigs	$	49 50
Average profit per pig	$	4 95
Total weight of pigs at beginning	lb.	297
Average weight of pigs at beginning	lb.	29·7
Total weight of pigs at end of 126 days	lb.	2,075
Average weight of pigs at end of 126 days	lb.	207·5
Total gain in 126 days	lb.	1,778
Average gain per pig	lb.	177·8
Average daily gain per pig	lb.	1·41
Average cost per pound of gain	ct.	6·98

WEIGHTS AND FEED RECORDS OF PIGS IN ADVANCED REGISTRY POLICY OF SWINE

Item		Group XD	Group XD
Number of pigs born	No.	12	10
Number of pigs weaned	No.	10	7
Weight of litter at birth	lb.	33	30
Weight of litter at weaning	lb.	267	224
Days from farrowing to weaning	days	43	42
Cost of feed, farrowing to weaning	$	12 37	11 65
Cost to raise one pig from birth to weaning	$	1 24	1 66
Number of pigs in Slaughter Test	No.	5	5
Total weight at weaning	lb.	136	161
Total weight at finish	lb.	1,043	1,032
Total gain	lb.	907	871
Number of days in feeding trial	days	126	126
Average daily gain	lb.	1·44	1·38
Average number of days, birth to finish		169	168
Total meal eaten (at $2.25 per cwt.)	lb.	2,305	2,305
Pounds of meal eaten per pound of gain	lb.	2·5	2·6
Total milk consumed (at 20 cents per cwt.)	lb.	5,103	5,103
Total cost of feed	$	62 07	62 07
Feed cost per 100 pounds of gain	$	6 84	7 13
Cash returns	$	112 44	111 20
Net returns, birth to finish	$	44 19	40 81

FIELD HUSBANDRY

The frost was all out of the ground early in April, and some ploughing was done April 19. Ploughing was finished in the orchards April 28. The first grain was seeded April 30. Turnips were taken from the storage pit and planted in the field May 2. Farm work was general May 3. Mangels, carrots and turnips were seeded May 16, and corn May 17 and 20. Conditions for germination were good and an even stand of plants was secured. The rainfall for May was 0·86 of an inch less than the previous 16-year average. During June the precipitation was 1·23 inches less than the average, and growing crops were feeling the need of moisture. The July precipitation was greater than usual, but practically all fell during the first half of the month. Both August and September were dry, and while ideal for grain harvesting were not favourable to root crops and the crop was light. The yield of field corn, the greater part of which was grown on alfalfa sod ploughed in the fall of 1929, was good, averaging 17·6 tons per acre. The roots harvested were: mangels, 2,013·4 bushels; turnips, 1,575 bushels; carrots, 378·4 bushels; sugar beets, 58·7 bushels, a total of 4,025·5 bushels. The potato areas yielded 722·2 bushels. The following quantities of grain were harvested: oats, 803 bushels; barley, 55 bushels; wheat, 32 bushels. Corn placed in the silo amounted to 163·63 tons; sunflowers, 10·32 tons, a total of 173·95 tons. Hay, clover and timothy amounted to 102·96 tons, which together with 2·5 tons of alfalfa made a total of 105·46 tons of hay.

Weather conditions for harvesting were almost ideal. Haying was completed July 28 and all grain was harvested by August 23.

A COMPARISON OF DIFFERENT FODDER CROPS

This year, 1930, was the ninth year of a test begun to determine the average yield, cost of production and value of various fodder crops. The project consists of the growing of mangels, turnips, corn, sunflowers, and oats, peas, vetches on half-acre plots. The land used is as uniform as possible and is treated alike as to cultural and fertilizing methods. It is thought that by carrying on this work over a number of years, under varying weather conditions, a reliable guide may be secured as to the yield and cost of the various crops under test. In addition records are kept of the yields of grain and hay following each of the crops in the experiment. Records are also kept of the cost of production of oats, clover hay and other farm crops.

The test of the different fodder crops was conducted this year on land which had grown roots in 1929, this being the only uniform ground available for the work. The land was ploughed in the fall of 1929 and manured in the spring of 1930 at the rate of 20 tons per acre. This manure was ploughed in, the land disked, and 700 pounds per acre of 5-9-8 fertilizer applied broadcast. The fertilizer was well worked into the soil with the wide spring-tooth cultivator drawn by the tractor. The smoothing harrow was then passed over the land to break up any small lumps, leave a slight dust mulch over the surface and generally bring about a better mechanical condition of the soil. For mangels and turnips rows were run 2½ feet apart with the horse hoe. These were lightly rolled down and the seed sown with the garden drill. Corn, sunflowers, and O.P.V. were seeded with the grain drill. The varieties used were: mangels, Danish Sludstrup; turnips, Kentville Bangholm; corn, Longfellow, and sunflower, Mammoth Russian. The oats, peas, vetches mixture was made up as follows: oats, 2½ bushels; peas, ¾ bushel, and vetches, ⅓ bushel. The seed used per acre was: turnip, 3 pounds; mangels, 15 pounds; corn, 30 pounds; sunflowers, 15 pounds, and O.V.P., 3 bushels.

Owing to the exceptionally dry weather during the critical part of the growing season and the ravages of the cabbage worm on the turnips the yields were materially reduced, with a consequently higher cost per ton or bushel.

In figuring production costs manure is valued at $2 per ton, spread, and 40 per cent is charged to the first crop of the rotation. Labour is charged at 30 cents per hour. Ten cents per hour is charged for each horse, $1.25 per hour for tractor and operator, and $2.85 per acre for the use of machinery. The land ental is charged at $3 per acre, being 6 per cent interest on a valuation of $50 per acre.

Cost per Acre of Producing Silage Corn

Item	1930	Average 1922-1930
	$	$
Rent	3 00	3 00
Manure and fertilizer	22 00	21 54
Seed	1 55	1 38
Machinery	2 85	2 65
Twine	0 48	0 52
Manual labour	16 80	19 24
Horse and tractor labour	6 85	6 27
Gasoline and oil	1 50	1 10
Total cost per acre	55 03	55 70
Yield per acre tons	14·52	16·64
Cost per ton $	3 79	3 35

Cost per Acre of Producing Sunflowers

Item	1930	Average 1922-1930
	$	$
Rents	3 00	3 00
Manure and fertilizer	22 00	21 54
Seed	1 50	1 48
Machinery	2 85	2 65
Twine	0 48	0 52
Manual labour	19 80	25 70
Horse and tractor labour	6 85	6 55
Gasoline and oil	1 50	1 26
Total cost per acre	57 98	62 70
Yield per acre ..... tons	16·65	19·06
Cost per ton ..... $	3 48	3 29

Cost per Acre of Producing Turnips

Item	1930	Average 1922-1930
	$	$
Rent	3 00	3 00
Manure and fertilizer	22 00	21 54
Seed	1 35	1 14
Machinery	2 85	2 65
Manual labour	36 75	35 59
Horse and tractor labour	7 00	6 44
Total cost per acre	72 95	70 36
Yield per acre ..... bush.	576·8	639·5
Cost per bushel ..... cents	12·6	11·0
Yield per acre ..... tons	14·42	15·98
Cost per ton ..... $	5 06	4 41

Cost per Acre of Producing Mangels

Item	1930	Average 1922-1930
	$	$
Rent	3 00	3 00
Manure and fertilizer	22 00	21 54
Seed	6 45	3 44
Machinery	2 85	2 65
Manual labour	37 80	34 50
Horse and tractor labour	7 00	6 48
Total cost per acre	79 10	71 61
Yield per acre ..... bush.	611·6	734·2
Cost per bushel ..... cents	12·9	9·8
Yield per acre ..... tons	15·29	18·36
Cost per ton ..... $	5 17	3 93

COST PER ACRE OF PRODUCING O.P.V.

Item	1930	Average 1922-1930
	$	$
Rent	3 00	3 00
Manure and fertilizer	22 00	21 54
Seed	4 40	4 69
Machinery	2 85	2 44
Manual labour	4 05	6 17
Horse and tractor labourer	4 75	4 04
Gasoline and oil	.....	0 46
Total cost per acre	41 05	42 34
Yield per acre.....tons	4·24	7·23
Cost per ton..... $	9 68	5 85

SUMMARY—COMPARISON OF DIFFERENT FODDER CROPS

Year	Yield per acre				
	Corn	Sun flowers	Turnips	Mangels	O.P.V.
	tons	tons	tons	tons	tons
1922	19·92	20·80	21·28	17·59	5·01
1923	14·90	19·80	19·14	16·47	8·26
1924	13·31	18·13	13·41	19·62	4·95
1925	23·18	27·50	17·37	25·56	10·30
1926	16·86	17·44	16·63	19·30	7·40
1927	15·56	20·98	12·46	18·47	10·70
1928	21·39	19·56	15·53	20·70	8·51
1929	10·04	10·69	13·65	12·19	5·63
1930	14·52	16·65	14·42	15·29	4·24
Average yield per acre	16·63	19·06	15·98	18·36	7·23

	Cost per acre				
	$	$	$	$	$
1922	60 78	63 73	69 34	69 89	47 37
1923	45 32	53 91	58 25	69 60	30 44
1924	56 57	69 70	69 34	72 08	41 46
1925	60 55	73 59	80 84	77 52	43 48
1926	54 93	61 25	66 35	67 90	38 43
1927	52 51	63 90	68 76	63 76	43 21
1928	57 23	59 18	75 48	72 20	47 32
1929	58 53	61 03	71 85	72 45	48 30
1930	55 03	57 98	72 95	79 10	41 05
Average cost per acre	55 72	62 70	70 36	71 61	42 34
Average cost per ton	3 35	3 29	4 41	3 93	6 05

COST PER ACRE OF PRODUCING OATS

Item	1930	Average 1922-1930
	$	$
Rents	3 00	3 00
Manure and fertilizer	16 33	12 51
Seed	2 40	2 90
Machinery	2 85	2 43
Twine	0 48	0 53
Manual labour	6 30	6 96
Horse and tractor labour	5 10	4 08
Total cost per acre	36 46	32 41
Yield per acre grain ..... bush.	56·6	62·4
straw ..... tons	1·39	1·34
Cost per bushel after deducting value of straw at $6 per ton ..... cents	49·7	39·1

COST PER ACRE OF PRODUCING CLOVER HAY

Item	1930	Average 1922-1930
	$	$
Rent	3 00	3 00
Manure and fertilizer	7 15	6 24
Seed	2 82	3 48
Machinery	2 85	2 85
Manual labour	7 42	7 75
Horse labour	1 37	1 49
Total cost per acre	24 61	24 81
Yield per acre ..... tons	1·67	2·60
Cost per ton ..... $	14 73	9 75

WEED CONTROL

Work on weed control during 1930 has been confined to two of the most important weeds in this district. Wild Radish or Jointed Charlock (*Raphanus Raphanistrum*), and King Devil (*Hieracium pracaltum decipiens*).

The work with wild radish was done in a crop of oats badly infested with this weed. Copper sulphate solutions were used in three different strengths: 15 pounds to 50 gallons of water, 3 per cent; 20 pounds to 50 gallons of water, 4 per cent, and 25 pounds to 50 gallons of water, 5 per cent; all applied with a power sprayer at 250 pounds pressure. The spraying was done June 28 when oats were 14 inches high and the radish slightly taller than the oats and practically in full bloom. It might have been better to have done this spraying earlier, but as that was not possible it was thought advisable to spray the weed with the idea of preventing the formation of seed, thus lessening future crop infestation. The results of this test are given below. The plots are one-ninth acre each.

RESULTS OF EXPERIMENT WITH WILD RADISH

Plot	Spray solution used	Yield per plot		Seeds of wild radish in grain
		Grain	Straw	
		lb.	lb.	
1	15 pounds copper sulphate to 50 gallons water	72	188	Very few
2	20 pounds copper sulphate to 50 gallons water	80	205	Very few
3	25 pounds copper sulphate to 50 gallons water	71	179	Very few
4	Not sprayed	122	228	Large number

It was difficult during the growing season to detect any Wild Radish plants in the grain on the sprayed plots. However, a few seeds were noticed in the threshed grain from all the plots, indicating that some plants had escaped destruction and matured their seeds; the number found was negligible compared to those in the unsprayed plot. It will be noted that the yields of both grain and straw were considerably reduced by the weed control treatment, the grain being reduced about 40 per cent and the straw about 20 per cent. This land was seeded to clover and timothy, and the young clover plants apparently sustained no injury, the prospects for a crop of hay in 1931 being good.

This oats field presented a decidedly yellow appearance when the weed was in full bloom, so that evidently a large number of plants were destroyed. It would appear from this year's work that the three per cent solution is practically as effective as either of the others. The yields of grain and straw were greater on Plot 2, but Plot 1 appeared to be the least injured.

KING DEVIL

This pest is becoming a serious menace in many parts of this province, and while it is possible to keep it under control where a short rotation of crops can be practised it is much more difficult to destroy or control it in old permanent pastures where ploughing and cultivating cannot be done. In these locations it becomes a pernicious weed, avoided by stock on account of its pungent flavour and hairy nature. It spreads with great rapidity both by runners and by seeds which are carried by the wind. Different materials have been tried for the destruction of this weed, including salt and powdered bluestone in small and large quantities, with very indifferent results. The work this year was an attempt to find something which would kill out small patches of the weed in old pastures, even though all other vegetation on these spots was killed at the same time.

Three materials were used, gasoline, copper sulphate and sodium chlorate. Gasoline was used pure, copper sulphate in a 5 per cent solution, and sodium chlorate in a 10 per cent solution. A piece of ground covered with practically a solid mat of King Devil was selected and staked off into plots of 8 by 16 feet. All materials were applied June 28 by means of an ordinary water can with a fine hose. The day was hot and all plants perfectly dry. Notes taken on June 30 show that the leaves of the plants on the plots sprayed with gasoline were very badly burned. The plants on the bluestone and sodium chlorate plots did not show any injury. Notes taken two weeks later show that practically all the plants on the gasoline and sodium chlorate plots were killed, while no injury was noticed on the copper sulphate plots. Notes taken in September show that a few plants on both the gasoline and sodium chlorate plots were showing signs of recovery; this would indicate that another application would be necessary for their complete eradication. In none of the plots where gasoline and sodium chlorate were used was there at any time any bloom on the King Devil plants, so that increase by seed distribution was thus prevented. Slightly over one quart of liquid was required to spray each of these 8 by 16-foot plots, using a fine rose on the water can. Two other plots were sprayed with gasoline through an atomizer to lessen the quantity of liquid required, thus reducing the cost, but the control on these plots was negligible. The cost of two applications of this chlorate of soda solution on a plot of 8 by 16 feet would be about 6 cents, and of gasoline about three times this amount.

HORTICULTURE

SMALL FRUITS

STRAWBERRIES

The strawberry crop was very poor, due to the dry weather of 1929 not favouring runner development, late-rooted small plants having resulted. The plantation was mulched and came through the winter in good condition. A frost on May 30 did much damage to the blossoms, which had commenced to open two days previously. June had an abnormally high temperature, 10·6 degrees above the average, and this with a low rainfall gave small berries and a generally inferior crop, with much mishapen fruit due to the May frost. The best yields have been from Senator Dunlap, Jersey Giant, Rewastico, Gold Mine, and Premier.

The plantation set comprises Senator Dunlap, Premier, Portia, Glen Mary, Parson Beauty, Aroma, Marvel, Blakemore, Bliss, and Boquet. The small test plots were discontinued and larger areas for shipping tests were put in. The dry summer of 1930 adversely affected the plantation, and the development of runner plants was greatly retarded.

RASPBERRIES

Following as it does the strawberry crop, the raspberry is becoming increasingly popular. This fruit will grow on almost any soil, but a good loam with good drainage is best. The plants are set in rows six feet apart and three feet apart in the row. It is important to keep all grass and weeds out of the plantation at the start, as much trouble will later result if this is not done. Couch grass is particularly troublesome, and many plantations are not satisfactory because of the growth of grass in them. The fruiting canes should be cut out after fruiting, and any weak new growth eliminated. If the canes are grown in a hedge row it should be not more than 14 inches wide, on the average, with the canes not less than 6 inches apart.

Raspberries made a poor cane growth in 1929, and this was reflected in the yields for 1930. In addition, the dry season and higher temperature of 1930 caused the fruit to ripen prematurely. The fruiting season was from July 16 to August 4. The fruit was generally small, soft, and not attractive in quality. The best crops, in order of yield, were from Newman No. 23, Newman No. 20, and Herbert. Newman No. 23 is an early, hardy, productive variety with large crimson-red berries of good quality. Newman No. 20 is a few days later, and produces a slightly larger, more attractive, firmer berry of slightly higher quality than No. 23, but is somewhat less productive. These two varieties are more vigorous growers, producing more sturdy, upright canes and giving higher yields, than Herbert.

A new plantation of Viking raspberry was set out in the spring of 1930.

CURRANTS AND GOOSEBERRIES

The market for bush fruits in Nova Scotia is limited, and an outlet for the product should be considered before making heavy plantings. The development of jam and jelly-making would materially assist in disposing of these fruits. Where the white pine blister rust is present nothing but constant spraying with lime-sulphur will prevent this disease from rendering the plantation unprofitable.

The demand for black currants is limited. Of the varieties tested the Black Victoria has been the most vigorous and productive. Red currants are used principally for jelly. Fay Prolific has been the best. Perfection also is good.

Because the European sorts of gooseberries are susceptible to mildew it is practically impossible to grow them in Nova Scotia. Frequent plantings of the best large-fruited English sorts have been made but the control of this disease has not been possible. The American sorts are resistant to mildew, but varieties with a larger fruit are desirable. The Houghton is too small and it is doubtful if this sort should be planted at all. The Downing is the most productive, and if the bushes are well pruned every year and fertilized, a fair size of fruit is obtainable. The Josselyn or Red Jacket is excellent in quality and somewhat larger than Downing. Mabel and Charles, varieties produced at the Experimental Farm, Ottawa, are desirable sorts with larger fruit than Downing. Over a nine-year period Downing produced an average of 7,312 quarts and Josselyn 5,333 quarts, per acre.

STONE FRUITS

These trees are 20 feet by 20 feet, with a strip of grass about the trees to a width of 4 feet on either side of the row. These strips are clipped two or three times during the summer and left as a mulch around the trees. The space between the sod strips is cultivated frequently until the middle of July. A moderate dressing of poultry manure is given to each tree, on the grass area, an equal amount to each tree, and 540 pounds of a fertilizer made up of 200 pounds of sulphate of ammonia, 200 pounds of nitrate of soda, 300 pounds of superphosphate and 100 pounds of muriate of potash is applied evenly, per acre, each year. This was applied this year during the second week in May.

Philadelphus of various kinds in group planting.

This orchard was sprayed as follows: a dormant spray early in April, before the buds started, using one gallon of concentrated lime-sulphur to 40 gallons of water, for the control of leaf curl and plum pocket. Before bloom a 1-40 lime-sulphur was again used, together with 1½ pints of nicotine sulphate and 2½ pounds of arsenate of lead to each 100 gallons, for aphids, leaf spots,

brown rot, and eating insects. After the petals fell wetable sulphur was used. Two weeks later, and following this at an interval of two weeks, a plain sulphur dust was applied to control the brown rot, a disease giving much trouble at harvest if it is not controlled.

PLUMS

Because of the motor truck as a means of distribution, the plum crop is reaching districts where this fruit is not grown, and the demand is increasing and better prices are being realized.

The demand is for plums of good size, and the Burbank seems to be a favourite. Because of the usually heavy set of this variety thinning by removing over one-half of the set fruit is advised. Miller Superb is a yellow plum of excellent quality. The Reine Claude de Bavay is a late green plum of good quality and medium size which is liked by the trade. Quackenboss, a large blue plum of fair quality, meets a ready demand. Bradshaw, another blue plum, is large and attractive, of fair quality and fairly productive. Monarch, a late blue plum, also meets with a ready sale, and because of being the latest market plum is advised as a desirable sort.

The prune plums have received much attention at this Station, and of these the Italian or Fellenberg is probably the best. The German prune has given good crops and, like the Italian, makes an excellent prune product. There are a number of trees of the Giant Prune, a large red plum, and the prune produced from these is excellent in quality. It has not been very productive, and is very susceptible to brown rot.

Imperial Epineuse, Washington, Magnum Bonum, and Peters Yellow Gage are varieties well liked by the trade.

CHERRIES

The cherry is probably the fruit cultivated first in Nova Scotia, having been brought in by the early settlers from France. There are no extensive plantations of this fruit in the province but nearly every farm has a few trees.

Because the Duke and sweet cherries are more tender than the sour kinds they are not so generally grown. The sour cherry will grow in almost any part of the province. Early Richmond has been largely planted but Montmorency, one of the best sorts, is now being planted in preference. The Morellos have a dwarf habit of growth and the fruit is later in ripening than Montmorency. The Morellos, because of their dark red juice, make a very attractive canned product.

The Duke cherries are hybrids of the sweet and sour cherries. May Duke is the hardiest variety, and is an excellent sort for garden culture. Nouvelle Royal, Royal Duke, Empress Eugenie, Arch Duke, Olivet, Louis Philippe and Late Duke are the best of this group. The Dukes in general are weak in growth and not profitable commercially at this Station.

Many of the varieties of sweet cherries are not very thrifty after a few years of fruiting, and in some years the pistils show winter injury and other defective conditions in the bud which cut down the yields. Birds are very fond of sweet cherries and are most destructive to the earlier ripening kinds. They destroy practically all the fruit on the earlier sorts, such as Early Purple, Governor Wood, Coes Transparent, Florence, Ida, and Kirkland. The later-ripening sorts, as Black Tartarian, Bing, Napoleon, Mercer, Windsor and Paul seem to escape the birds fairly well, and fairly satisfactory crops are harvested from these sorts, which are the most satisfactory of the sweet cherries tested here.

APPLES

APPLE TREE GROWTH AND PRODUCTION AS INFLUENCED BY APPLICATIONS OF GROUND LIMESTONE

To determine the value of lime for apple tree growth and productiveness, tests have been conducted since 1916, using ground limestone at the rate of two tons per acre. The applications were made in 1916, 1919, 1923, 1926, and 1929, or, in other words, a total of ten tons per acre has been used on the limed plots since the beginning of the test.

The orchard was planted in 1913. The standard trees, either Gravenstein or McIntosh, are 40 feet apart, with Wagener as a filler, making the trees in the orchard 20 feet by 40 feet. This orchard was divided into plots of four trees each, two Wagener and two of either McIntosh or Gravenstein. Fertilizers as stated in the following tables were applied in the spring of 1913, 1914, 1916, 1917, 1919, 1920, 1922 and annually since that time. Manure was applied to certain plots at the rate of 15 tons per acre in 1913, 1916, 1919, 1923 and 1925, and from 1927 on at the rate of 5 tons per acre annually.

This orchard during the first ten years of its development was under a three-year rotation, potatoes, wheat and clover hay, on the area not occupied by the growing trees, and during that time the yields of clover hay from this area were much greater on the limed plots. The clover hay was cut and removed, and also the second growth, in order to obtain the yields from this area, so that the increase in humus was consequently only from the clover roots left in the soil. The cultivated area of 6 to 8 feet at each side of the tree was not seeded to a cover crop.

From the results recorded there seems to be no apparent gain in apple production from the use of lime, although the trees in the limed plots show a greater average diameter when calipered ten inches above the surface of the ground. The limestone applied to these plots has cost to date $40 per acre, plus the cost of hauling from the car and spreading on the soil. The unlimed plots have given a total yield of 10·92 barrels of apples per tree, while the limed plots have only yielded a total of 10·56 barrels per tree, since planting in 1913. This difference of 0·36 of a barrel per tree makes 19·44 barrels per acre over the 13 years, or an average of 1½ barrels per acre per year in favour of the no lime treatment.

36864—4½

Plot	How fertilized per acre	Diameter of tree			Total yield per tree since planting		
		First tree	Second tree	Average	First tree	Second tree	Average
		in.	in.	in.	brl.	brl.	brl.
	Gravenstein			Without limestone			
30	Manure, 5 tons; slag, 500 pounds	10·25	9·80	10·02	12·00	12·50	12·25
27	Manure, 5 tons; superphosphate, 250 pounds; slag, 250 pounds	9·95	10·50	10·22	9·39	19·45	14·42
25	Manure, 5 tons	9·50	9·00	9·25	12·57	8·73	10·65
31	Manure, 5 tons; superphosphate, 500 pounds	10·00	9·10	9·55	13·48	13·52	13·50
	Averages	9·92	9·60	9·76	11·86	13·55	12·70
				With limestone			
28	Manure, 5 tons; slag, 500 pounds	.....	9·85	(9·85)	*	16·25	(16·25)
29	Manure, 5 tons; superphosphate, 250 pounds; slag, 250 pounds	.....	11·40	(11·40)	*	17·05	(17·05)
32	Manure, 5 tons	11·50	10·20	10·85	14·05	9·48	11·76
33	Manure, 5 tons; superphosphate, 500 pounds	11·35	11·15	11·25	14·05	13·96	14·00
	Averages	11·42	10·65	10·89	14·05	14·18	14·76
	McIntosh			Without limestone			
51	Superphosphate, 500 pounds	7·65	6·70	7·17	17·61	17·90	17·75
49	Nitrate of soda, 150 pounds; superphosphate, 500 pounds	7·40	6·70	7·05	15·27	8·39	11·83
44	Check, no fertilizer	8·15	6·55	7·35	21·43	10·70	16·06
	Averages	7·73	6·65	7·19	18·10	12·33	15·21
				With limestone			
43	Superphosphate, 500 pounds	7·85	8·15	8·00	12·75	13·96	13·35
41	Nitrate of soda, 150 pounds; superphosphate, 501 pounds	8·45	7·05	7·75	9·55	5·32	7·43
48	Check, no fertilizer	8·80	8·80	8·80	20·98	18·98	19·98
	Averages	8·37	8·00	8·18	14·43	12·75	13·59
	Wagener			Without limestone			
30	Manure, 5 tons; slag, 500 pounds	6·70	7·65	7·17	7·86	7·39	7·62
31	Manure, 5 tons; superphosphate, 500 pounds	5·50	7·20	6·35	4·84	13·45	9·14
25	Manure, 5 tons	7·50	6·60	7·05	7·45	5·59	6·52
27	Manure, 5 tons; slag, 250 pounds; superphosphate, 500 pounds	6·60	6·55	6·57	11·09	9·11	10·10
51	Superphosphate, 500 pounds	6·90	7·00	6·95	7·89	11·68	9·78
21	Slag, 500 pounds	8·00	7·10	7·55	13·11	13·48	13·29
22	Nitrate of soda, 150 pounds; slag, 500 pounds	7·80	8·00	7·90	13·05	15·34	14·19
10	Nitrate of soda, 150 pounds	5·60	6·70	6·15	5·02	7·48	6·25
49	Nitrate of soda, 150 pounds; superphosphate, 500 pounds	6·20	7·20	6·70	7·32	10·25	8·78
50	Nitrate of soda, 150 pounds; slag, 500; muriate of potash, 150	6·60	6·80	6·70	10·20	10·48	10·34
44	Check, no fertilizer	6·40	5·60	6·00	3·00	5·22	4·11
	Averages	6·71	6·95	6·83	8·26	9·95	9·10
				With limestone			
28	Manure, 5 tons; slag, 500 pounds	7·30	6·55	6·92	10·43	6·59	8·51
33	Manure, 5 tons; superphosphate, 500 pounds	7·20	7·05	7·12	8·57	11·23	9·90
32	Manure, 5 tons	7·80	*	(7·80)	9·54	*	(9·54)
29	Manure, 5 tons; slag, 250 pounds; superphosphate, 250 pounds	7·75	6·65	7·20	16·98	10·59	13·78
43	Superphosphate, 500 pounds	7·35	7·35	7·35	7·79	8·50	8·14
38	Slag, 500 pounds	6·90	7·15	7·02	7·73	5·11	6·42
36	Nitrate of soda, 150 pounds; slag, 500 pounds	5·65	5·00	5·32	4·27	1·43	2·85
42	Nitrate of soda, 150 pounds	7·50	6·50	7·00	12·47	9·04	10·75
41	Nitrate of soda, 150 pounds; superphosphate, 500 pounds	6·05	7·35	6·70	5·50	7·29	6·39
39	Nitrate of soda, 150 pounds; slag, 500 pounds; muriate of potash, 150 pounds	7·90	7·35	7·62	5·29	9·11	7·20
48	Check, no fertilizer	*	5·95	(5·95)	*	6·82	(6·82)
	Averages	7·14	6·69	6·92	8·86	7·57	8·21

* Young tree planted.

SUMMARY—INFLUENCE OF SOIL ACIDITY ON APPLE TREE GROWTH AND FRUIT PRODUCTION, 1913 TO 1930

Number of plots	Variety	Average diameter of trees	Average yield per tree since planting	Average yield per acre since planting
		in.	brl.	brl.
		Without limestone		
3	McIntosh	7·19	15·21	410·67
4	Gravenstein	9·76	12·70	342·90
11	Wagener	6·83	9·10	245·70
	Averages	7·54	10·92	294·84
		With limestone		
3	McIntosh	8·18	13·59	366·93
4	Gravenstein	10·89	14·76	398·52
11	Wagener	6·92	8·21	221·67
	Averages	9·12	10·56	285·12

THINNING WEALTHY APPLES

A number of the commercial varieties of apples were thinned this year. The work was started probably ten days too late for best results. The thinning was done by grasping the stem of the apple with the thumb and forefinger, and forcing the fruit from the stem by the second finger. This permits of more rapid thinning than with shears. After a little practice both hands can be used satisfactorily.

The apples were thinned to one fruit to a spur and to between four and six inches apart. Records were kept of the costs and details of this work with the Wealthy variety only. These trees were set 40 feet by 20 feet, and have been set fifteen years. While the results indicate a lessening of the volume of fruit the apples are more uniform in size, of better colour, and with much fewer undersized fruits. The results indicate the practice of thinning to be profitable. Because of the dry weather all apples were much under normal size.

The following table gives the data obtained:—

THINNING WEALTHY APPLES: FRUIT PRODUCED

Item	Thinned	Not thinned
Date of thinning	July 22	.....
Number of trees in test	5	3
Average number of apples removed per tree	1,285	.....
Average yield per tree ..... brl.	3·36	3·97
Cost of thinning, per tree ..... cts.	14·6	.....
Average weight of apples grown per tree ..... lb.	441·5	443·3
Average weight, per tree, of apples grading $2\frac{3}{4}$ inches and up ..... lb.	7·97	3·20
Average weight, per tree, of apples grading $2\frac{1}{2}$ to $2\frac{3}{4}$ inches ..... lb.	140·77	45·33
Average weight, per tree, of apples grading $2\frac{1}{4}$ to $2\frac{1}{2}$ inches ..... lb.	116·37	104·00
Average weight, per tree, of apples grading 2 to $2\frac{1}{4}$ inches ..... lb.	134·97	174·97
Average weight, per tree, of apples grading below 2 inches ..... lb.	41·42	115·83
Percentage of crop grading $2\frac{3}{4}$ inches and up ..... %	1·81	0·72
Percentage of crop grading $2\frac{1}{2}$ to $2\frac{3}{4}$ inches ..... %	31·88	10·20
Percentage of crop grading $2\frac{1}{4}$ to $2\frac{1}{2}$ inches ..... %	26·36	23·46
Percentage of crop grading 2 to $2\frac{1}{4}$ inches ..... %	30·57	39·47
Percentage of culls, or grading below 2 inches ..... %	9·38	26·13

THINNING WEALTHY APPLES: COSTS AND RETURNS

Item		Thinned	Not thinned
Costs per acre			
Total yield per acre of 54 trees, 20 by 40 feet	brl.	181·44	214·38
Cost of thinning, 54 trees at 14·6 cents per tree	$	7 88	.....
Cost of picking at 10 cents per barrel	$	18 14	21 44
Cost of hauling at 5 cents per barrel	$	9 07	10 72
Cost of packing at 25 cents per barrel	$	45 36	53 60
Cost of barrels at 45 cents	$	81 65	96 47
Total costs	$	162 10	182 23

Returns per acre

—	Thinned	Not thinned	Thinned	Not thinned
	brl.	brl.	$	$
No. 1's (2½ inches and up) at $3.09 per barrel	60·40	22·22	186 64	68 66
Domestics (2½ inches and up) at $2.14 per barrel	0·72	1·18	1 54	2 53
No. 1's (2½ inches to 2 inches) at $2.83 per barrel	98·12	121·42	277 68	343 62
Domestics (2½ to 2 inches) at $1.80 per barrel	5·17	13·48	9 31	24 26
Culls at 25 cents per barrel	17·01	56·06	4 25	14 02
Value of barrels returned, at 30 cents each			5 10	16 80
Total returns			484 52	469 89
Total costs (as given above)			162 10	182 23
Profits after deducting above costs only			322 42	287 66
Increase in value of apples by thinning, per acre			34 76	

APPLE SCALD

Apple scald is a physiological or functional disease, producing a browning or bronzing of the skin of the apple. In mild cases the skin is merely tinted with brown and unaccompanied by softening or browning of the flesh tissues, the skin remaining firm. In more severe cases the skin may be broken down to such an extent as to slough readily from the underlying flesh. This disease differs from other apple diseases in that it attacks the green side of the fruit more readily than the bright red surface; in fact, bright red fruit is highly resistant to scald, and yellow surfaces are more resistant than green. An apple that has been scalded becomes an easy prey of the various rot organisms, and soon decays.

It is supposed that the scald is due to the accumulation of esters or similar products of the apple in the tissues of the fruit and in the surrounding air of the storage. The gases or vapors of these substances become concentrated in the headed barrel of apples, or in the poorly ventilated package or warehouse. Tests at this Station show conclusively that apples stored in open-headed barrels or in orchard boxes, in a well ventilated warehouse with the temperature ranging between 33 and 40 degrees from December to March, are much more immune to scald injury than are apples stored in headed barrels with higher temperatures. The conclusion drawn is that the vapors or esters given off by the apples in the course of their maturity are carried away by air currents, or, where oiled paper wraps or shredded paper are used, are absorbed by the oil contained in the paper.

The amount and severity of the scald varies with the season, the maturity of the apples and also with the variety. The season of 1929 was too short for

the best maturity and highest colour development of the apple, and scalding of fruit in warehouses that season was much more serious than during the early, dry season of 1930, when scald was not a serious factor until the last shipment. There is a marked difference in the susceptibility of the different varieties. York Imperial, which, because of the shortness of the season has to be harvested before it attains proper maturity, invariably scalds badly. Other susceptible varieties are Wagener, Stark, Greening, Mann, Baldwin and many of the newer imported varieties, such as Stayman Winesap, Mammoth Black Twig and Delicious.

The most satisfactory measure yet known for controlling apple scald is the use of tissue paper wrappers or shredded tissue paper impregnated with fifteen per cent of odorless mineral oil. For the fruit grower who is packing his apples in boxes the shredded paper is advocated at harvest time and the wrap at packing time. For the barrel packer the shredded paper is more suitable, because it can be distributed evenly about the fruit within the barrel at harvest time (at the rate of one and a half pounds of paper to the barrel of fruit), and conserved and again distributed throughout the barrel when packing.

Measures for controlling apple scald are most necessary during the period of storage immediately after picking, because the scald-producing agencies are apparently most active during the first month or two of storage and preventive measures are practical and largely effective during this period. That is, varieties of apples subject to scald that are to be packed within a month after harvest could reasonably have the oiled paper wraps put on or the shredded oiled paper distributed throughout the package at packing time. If longer storage is necessary the proper practice is to place shredded oiled paper in the barrel before it goes into storage, and the logical time to do this is when the fruit is placed in the barrel at harvest time. If oiled paper has not been used the apples from storage may show no scald at packing time, but after the packing and exposure to the air, particularly if at a high temperature, will show evidences of scald in a few days.

Storage tests have been conducted here with certain susceptible varieties of apples, wrapped with oiled paper at the time of packing in boxes. The following table gives the average results from a number of varieties.

OILED PAPER FOR APPLE SCALD

Year	Number of apples examined	Per cent sound	Per cent scald	Per cent rot
Oiled paper wraps—				
1925	3,825	89·3	0·0	10·7
1927	6,352	89·6	0·1	10·3
Without oiled paper wraps—				
1925	3,943	71·1	14·6	14·3
1927	6,483	70·2	15·3	14·5

DEHYDRATION WORK

During the fall of 1929 a dehydrator of the box-side flow-type was constructed at the Experimental Station. A flow is provided by a Keith fan, operated by a five-horsepower motor. Heat is provided with regulated steam flow from a 20-horsepower upright boiler to a radiator within the dehydrator. Owing to physical defects, chiefly a leaky section in the radiator, unsatisfactory results were obtained during the 1929 season. These faults were corrected during the fall of 1930 and dehydration tests were made.

It would seem that in Nova Scotia during the past few years the returns from dried fruit products has not been sufficiently profitable to warrant an extensive continuation of the dehydrators and evaporators. The trade in these products is becoming more exacting every year, and a more uniform product than that possible from different sizes of fruit and a mixture of varieties is demanded. This would indicate the necessity of grading to size and the desirability of making a single variety product rather than one composed of several varieties. The research conducted, consequently, was to ascertain just what conditions were necessary to produce a suitable product from apples not desirable for shipment.

Experiments were outlined to determine the relative value of different varieties for dehydration; the relation between the size of the fruit and cost of the product; the physical condition necessary to produce the best quality of product, and the relation of physical conditions of operation to cost of production.

VARIETIES.—Eighteen of the standard varieties were tested under uniform conditions, and of these Wagner, Wellington, Ben Davis, Baldwin, Golden Russet, Nonpareil and King seemed best in colour and quality of product.

SIZE.—The smaller sizes produce less prepared fruit from a given weight, and the length of time necessary to prepare an equal volume is much greater than with larger sizes. Grading to uniform size results in more even drying, as small rings dry more quickly than large ones, and it is doubtful if a product to meet present demands is possible if grading is not done. It would appear that apples below two inches in diameter cannot be dehydrated profitably, as the small rings are not wanted by the trade except at a low price.

PHYSICAL CONDITIONS.—The physical conditions under which apples are dried are an important factor in determining the quality of the fruit. The conditions of prime importance in dehydration are temperature, humidity and rate of evenness of air flow. In general, it was found that a temperature of over 165 degrees Fahr. at the end of the drying period was conducive to discoloration, associated with caramelizing of the sugars in dried product. No serious effects were noticed from high temperatures at any other period. An even air flow of between 500 and 600 feet per minute provided uniform drying conditions.

ASSISTANCE GIVEN.—In addition to the work done at the Station assistance was given to a firm operating a tunnel dehydrator. Certain conditions produced inefficient drying, and by correcting these conditions the drying time per truck of fruit was greatly reduced.

VEGETABLES

ASPARAGUS

Seeds of the variety Mary Washington were started in flats in the greenhouse in 1925, and the plants from these were set to the field in June, six inches apart in rows two feet apart. Half of these plants were set to permanent beds in May, 1926, as one-year-old plants, and the other half were set in May, 1927, as two-year-old plants. Seeds were also sown in the field in May, 1925, and the plants transplanted in July, in rows similar to the greenhouse-started plants, and these were set permanently in May, 1926.

The permanent plantings were set also with the object of finding out the distance plants should be spaced in the row. The plots of each planting were 33 feet long, and the plants were set $1\frac{1}{2}$, 2, $2\frac{1}{2}$ and 3 feet apart in different rows with the rows spaced 4 feet apart. The cuttings made in 1930 were as set forth in the table below. The yield is also given from an old plantation of Argenteuil set in 1913. This planting was spaced 2 by 4 feet, and the yield is from 100 feet of row.

The variety Mary Washington is considered to be one of the best varieties now grown.

ASPARAGUS—MARY WASHINGTON: YIELDS, 1930

Distance apart in rows	Number of tips cut	Weight of tips	
		lb.	oz.
One-year plants sown in greenhouse; set permanently in 1926—			
1½ feet	400	5	6
2 feet	294	4	14
2½ feet	194	3	5
3 feet	155	2	12
Total yield, 132 feet	1,043	16	5
Two-year plants sown in greenhouse; set permanently in 1927—			
1½ feet	251	7	0
2 feet	171	3	8
2½ feet	135	1	9
3 feet	154	2	13
Total yield, 132 feet	711	14	14
One-year plants sown in field; set permanently in 1926—			
1½ feet	334	5	11
2 feet	295	5	15
2½ feet	192	3	1
3 feet	124	1	13
Total yield, 132 feet	945	16	8
Old Plantation, Argenteuil, 100 feet	972	16	5

BUSH BEANS

TEST OF VARIETIES.—Thirty-four varieties and strains were compared for their yield of green beans. They were sown May 23 in rows 2½ feet apart, a 33-foot row of each, and thinned to 2 inches apart in the row. The yields of the highest fifteen are given in the table.

The yields of seed from the same fifteen varieties and strains, similarly grown in other 33-foot rows, are also given in the table. There was only a slight amount of anthracnose on the seed, not exceeding ten per cent, except in the case of Round Kidney Wax (Graham), which had 48 per cent.

Hodson Long Pod, Black Wax Pencil Pod, Wardwell Wax and Sure Crop Wax are good wax varieties. The first named is more resistant to pod diseases than any other variety, and is the principal variety used for canning. Stringless Green Pod and Refugee are good green-pod varieties.

BUSH BEANS—RESULTS OF TEST OF VARIETIES

Variety and source of seed	Length of pods	Ready for use	Weight of green pods		Weight of seed beans	
	in.		lb.	oz.	lb.	oz.
Round Pod Kidney Wax (McDonald)	5½	July 23	35	8	3	10
Burpee Stringless Green Pod (Ewing)	5	July 20	33	2	5	10
Currie Rust Proof Wax (Cummings)	5½	July 18	32	14	4	0
Sure Crop Wax (Cummings)	6	July 23	32	2	5	12
Bountiful (D & F)	6½	July 20	31	14	4	2
Langport Wonder (Kelway)	6	Aug. 1	31	8	5	0
Round Pod Kidney Wax (Cummings)	6	July 23	30	14	3	10
Yellow Pod Bountiful (Schiel)	6	July 23	30	0	4	8
Wardwell Wax (Graham)	6	July 18	29	2	4	12
Round Pod Kidney Wax (Graham)	5¾	July 23	27	10	2	6
Giant Stringless Green Pod (Cummings)	5½	July 23	27	10	4	12
Low Champion Bush (Cummings)	5	July 24	27	0	5	8
Black Wax Pencil Pod (Cummings)	5¾	July 23	27	0	3	12
Refugee Wax (Cummings)	4½	July 23	26	10	1	4
Hodson Long Pod (Rennie)	6½	Aug. 1	25	4	4	10

CULTURAL TEST.—Two varieties were sown May 23 in rows 2½ feet apart, and thinned, in different rows, to 2, 4 and 6 inches apart in the row. In both varieties the greater the distance apart, the greater the yield of seed. The yields in the table are from rows 16½ feet long.

BUSH BEANS THINNED TO DIFFERENT DISTANCES APART

Variety and source of seed	Distance between plants	Ready to use	Total weight				Per cent of anthracnose on seed
			Green pods		Seed		
	in.		lb.	oz.	lb.	oz.	p.c.
Stringless Green Pod (C.E.F.)	2	July 22	15	8	1	4	2
	4	July 22	14	8	1	6	2
	6	July 22	15	10	2	2	2
Round Pod Kidney Wax (C.E.F.)	2	July 22	20	2	1	4	2
	4	July 22	16	6	1	8	6
	6	July 22	19	12	2	10	4

POLE AND BROAD BEANS

Three varieties of pole beans, Kentucky Wonder Wax, Golden Cluster, and No. 1 White Pole were tested, and gave yields in the order named. No. 1 Pole is a green-podded variety. Golden Cluster is rather late. One variety of broad beans. Windsor, was grown. It was ready for use August 15, and from a row 16½ feet long gave 9 pounds 4 ounces of green pods, and (from a row of similar length) 1 pound 8 ounces of seed beans. This is the first year in which black aphides, usually very plentiful on broad beans, did not appear.

BEETS

TEST OF VARIETIES.—Thirteen varieties and strains were sown May 1 in rows 16½ feet long, and 2 feet apart, and the plants thinned to 4 inches apart in the row. The yields were as given in the table. Detroit Dark Red is the best variety tested. Early Flat Egyptian is a good variety coming into use a little earlier.

BEETS—RESULTS OF TEST OF VARIETIES AND STRAINS

Variety and source of seed	Number of marketable roots	Weight of marketable roots		Number of roots not marketable
		lb.	oz.	
New Oval Gem (Henderson)	43	11	14	13
Early Flat Egyptian (Moore)	39	11	4	6
Early Model (Graham)	39	9	12	9
Cardinal Globe (Rennie)	40	9	8	9
Eclipse (Vaughan)	46	9	6	10
Early Wonder (Burpee)	45	9	6	7
Flat Egyptian (James)	12	9	4	12
Detroit Dark Red (Graham)	43	8	6	7
Crosby Egyptian (D & F)	39	8	4	10
Detroit Dark Red (Moore)	35	8	0	9
Detroit Dark Red (Ottawa—2195)	30	6	8	14
Detroit Dark Red (McDonald)	40	6	0	11
Black Red Ball (Burpee)	19	5	0	18

SUCCESSIONAL SOWING.—The variety Detroit Dark Red (McD.) was sown at approximately 10-day intervals from May 1 to June 9 in 15-foot rows, two rows at each sowing. One row of each sowing was harvested when ready for use, and the other row on October 3. It will be noted from the table that the

sowing on May 30 gave the best yields of those pulled when ready, and the June sowing the best yields of those left to grow until fall.

BEETS, SUCCESSIONAL SOWING: ROOTS PULLED WHEN READY

Date of sowing	Date of taking records	Number of marketable roots	Weight of marketable roots	Number of roots not marketable	Number of days from sowing to taking of records
			lb. oz.		
May 1	July 17	40	13 8	2	77
May 12	July 17	41	10 8	3	65
May 20	July 17	38	5 8	8	58
May 30	Aug. 4	47	20 0	.....	66
June 9	Aug. 4	36	7 4	.....	56

BEETS, SUCCESSIONAL SOWING: ROOTS LEFT TO GROW TILL FALL

Date of sowing	Date of taking records	Number of marketable roots	Weight of marketable roots	Number of roots not marketable	Number of days from sowing to taking of records
			lb. oz.		
May 1	Oct. 3	.....	.....	31	155
May 12	Oct. 3	7	3 4	36	143
May 20	Oct. 3	10	5 0	35	136
May 30	Oct. 3	17	8 0	32	126
June 9	Oct. 3	26	11 0	20	116

CABBAGE

TEST OF VARIETIES.—Twenty varieties and strains were sown in the greenhouse March 25, and transplanted to the field May 16, in rows 37½ feet long and 2¾ feet apart, the plants 18 inches apart in the row. The best early varieties (listed in order of maturity) are Golden Acre, Copenhagen Market, and Enkhuizen Glory, and the best late variety, Danish Ballhead. The records obtained are given in the table.

CABBAGE—SOWN IN GREENHOUSE AND TRANSPLANTED

Variety and source of seed	Number days to maturity	Number of heads harvested	Weight of three average heads
			lb. oz.
Danish Ballhead S.S. (Harris)	170	21	11 15
Golden Acre (Dreer)	114	20	11 9
Fottlers Improved Brunswick (Rice)	121	17	11 0
Danish Ballhead (Rice)	170	20	10 13
Succession (Ewing)	121	21	10 9
Copenhagen Market (Graham)	91	20	10 3
Danish Roundhead (Burpee)	170	22	9 15
Extra Amager Danish Ballhead (Ott. 8937)	170	19	9 8
Midseason Market (Harris)	115	23	8 11
Enkhuizen Glory (Rennie)	115	19	8 7
Copenhagen Market (Rice)	106	21	7 14
Danish Ballhead (Burpee)	170	21	7 13
Golden Acre (McDonald)	102	20	7 13
Winnigstadt (McDonald)	121	7	7 6
Copenhagen Market (D & F)	113	24	7 6
Danish Roundhead (D & F)	170	17	7 4
Jersey Wakefield (McDonald)	102	20	7 4
Golden Acre (D & F)	102	23	6 11
Copenhagen Market (Strandholm)	170	12	5 2
Golden Acre (Ewing)	92	18	4 0

Most of these varieties and strains, and a few others, were sown in the field May 1, and planted out June 19, in rows 33 feet long. The yields were as given in the following table.

CABBAGE—SOWN IN FIELD AND PLANTED OUT

Variety and source of seed	Number of days to maturity	Number of heads harvested	Weight of three average heads	
			lb.	oz.
Copenhagen Market (Rice)	131	10	11	11
Copenhagen market (Graham)	112	13	9	4
Danish Ballhead (Harris)	219	12	8	4
Succession (Ewing)	133	21	7	14
Golden Acre (Dreer)	173	14	7	10
Danish Ballhead (Rice)	219	16	7	8
Danish Hollander (Strandholm)	219	12	7	8
Enkhuizen Glory (Rennie)	133	9	7	5
Fottlers Improved Brunswick (Rice)	141	14	7	3
Golden Acre (McDonald)	168	14	6	12
Danish Ballhead (Burpee)	219	12	6	8
Danish Roundhead (Burpee)	219	7	6	7
Golden Acre (D & F)	112	15	6	1
Extra Amager Danish Ballhead (Ott. 8937)	219	7	6	0
Golden Acre (Ewing)	100	15	5	15
Danish Ballhead (Strandholm)	219	15	5	13
Midseason Market (Harris)	158	8	4	14
Jersey Wakefield (McDonald)	112	6	3	12
Winnigstadt (McDonald)	121	7	3	0

SUCCESSIONAL SOWINGS.—Successional sowings of two varieties in the field from May 1 to June 9 were made, with results as given in the table.

CABBAGE—RESULTS FROM SUCCESSIONAL SOWINGS

Variety and source of seed	Date sown	Date planted in field	Ready for use	Weight of three average heads	
				lb.	oz.
Extra Amager Danish Ballhead (Ott. 8975)	May 1	June 19	Oct. 29	5	12
	May 12	June 19	Oct. 29	5	11
	May 20	June 19	Oct. 29	4	3
	May 28	June 19	*	—	
	June 9	June 19	*	—	
Copenhagen Market (Graham)	May 1	June 19	Aug. 21	6	0
	May 12	June 19	Aug. 21	7	0
	May 20	June 19	Aug. 21	7	9
	May 28	June 19	Sept. 30	3	12
	June 9	June 19	Sept. 30	4	8

* Did not mature.

KEEPING QUALITIES.—Copenhagen Market and Extra Amager Danish Ballhead sown in May were stored at the beginning of October. The former is not a suitable variety to store for winter. Most heads of this variety were rotted by March 3. Of the Ballhead the heads which had the roots removed kept better than those with the roots on. These latter were hung from joists, and the ones with the roots removed were stored on slatted shelves. The best time to sow to obtain heads for winter storage appears to be early in May, and a late variety should be sown.

CARROTS

TEST OF VARIETIES.—Usually early sowings are very badly injured by the carrot rust fly, so that it is necessary to sow from the 14th to the 24th of June to escape this injury, but this year no rust fly was in evidence on any sowings. Most of the varieties attain to suitable size for winter storage from the second sowing, and the quality seems superior to that of the earlier sowing. Chantenay is a good, reliable variety for general purposes. Coreless is a distinct kind, coreless and of fine quality. Thirteen varieties and strains were sown May 1, and sixteen on June 19. These were in 8½-foot rows, two feet apart, the plants thinned to 2 to 3 inches apart in the row. The yields from both sowings are given in the table.

CARROTS—RESULTS OF VARIETY TEST

Variety and source of seed	Number of roots marketable	Weight of marketable roots		Number of roots not marketable
		lb.	oz.	
Sown May 1 (harvested Aug. 7)				
Golden or Early Market (Andrewes Mountain)	35	6	0	2
Coreless (Rice)	38	5	10	2
Early Scarlet Horn (D. & F.)	37	5	8	7
Champion Scarlet Horn (Patmore)	46	5	4	12
Long Orange (Vaughan)	45	5	0	7
Nantes (Steele Briggs)	41	5	0	5
Chantenay (McDonald)	31	4	14	3
Favourite (Patmore)	27	4	14	10
Long Red (Sutton)	43	4	2	8
Intermediate (Rennie)	27	3	8	10
St. Valery (D. & F.)	33	3	4	8
Danvers (Rennie	27	2	14	5
Chantenay or Red Core (Morse)	31	2	12	16
Sown June 19 (harvested Oct. 4)				
Long Red Surrey (D. & F.)	60	14	8	10
Chantenay or Red Core (Morse)	47	14	0	9
Favourite (Patmore)	56	13	0	6
Chantenay (Ott. 085A)	62	11	8	18
Chantenay (McDonald)	54	11	8	17
Coreless (Rice)	66	11	0	14
Golden Ball or Early Market (Andrewes Mountain)	55	11	0	8
Nantes (Steele, Briggs)	61	10	8	13
Scarlet Intermediate (Patmore)	43	10	0	19
Danvers (Rennie)	47	10	0	17
Intermediate (Rennie)	45	9	0	27
Champion Scarlet Horn (Patmore	53	6	0	22
St. Valery (D. & F.)	30	4	8	40
Long Red (Sutton)	33	4	0	37
Long Orange (Vaughan)	31	4	0	29
Early Scarlet Horn (D. & F.)	67	*		9

* No weight taken.

SUCCESSIONAL SOWINGS.—The variety Chantenay was sown at intervals from May 1 to June 9, in 30-foot rows. Half of each row was harvested Sept. 8, and the other half Oct. 3, with yields as given in the table.

CARROTS—RESULTS FROM SUCCESSIONAL SOWINGS

Date of sowing	Number of marketable roots		Weight of marketable roots				Number of unmarketable roots	
	Sept. 8	Oct. 3	Sept. 8		Oct. 3		Sept. 8	Oct. 3
			lb.	oz.	lb.	oz.		
Chantenay (McDonald)								
May 1	52	57	19	8	17	8	10	5
May 12	60	70	17	8	35	8	14	5
May 20	55	53	15	8	30	8	13	11
May 30	57	72	12	0	26	0	15	9
June 9	60	56	10	0	8	10	6	9

KEEPING QUALITIES.—Twelve roots of each variety from the first sowing, and twenty-five of each from the second sowing, were stored early in October in flats in a cellar at a temperature of 36 to 38 degrees Fahr. On March 3, when they were examined, there was practically no rot or damage evident in any variety.

CAULIFLOWER

TEST OF VARIETIES.—Six varieties and strains were sown in the field May 1 and planted out in June in 22-foot rows $2\frac{3}{4}$ feet apart, the plants $1\frac{1}{2}$ feet apart in the row. The yields are given in the table. Snowball and Early Dwarf Erfurt are good varieties.

CAULIFLOWER—RESULTS OF TEST OF VARIETIES

Variety and source of seed	Number of days to maturity	Weight of five average marketable heads		Total weight of heads			
				Marketable		Unmarketable	
		lb.	oz.	lb.	oz.	lb.	oz.
Snowball (I.T.S. TM)	118	2	4	19	0	.....	
Early Snowball (Graham)	87	4	8	18	0	10	0
Danish Perfection (Madsen)	118	2	7	6	4	.....	
Danish Dry Weather (McD.)	118	2	1	6	4	.....	
Early Dwarf Erfurt (D. & F.)	107	1	15	4	10	.....	
Early Erfurt (Strandholme)	118	1	12	1	6	.....	

CORN

TEST OF VARIETIES.—Twenty-nine varieties and strains were sown on May 22, and thinned to about eight inches apart in the row in June. The rows were 66 feet long and $3\frac{1}{2}$ feet apart, there being 105 plants of each variety. Although the season was dry the plants stood up well and gave a fine crop. The late varieties gave much better yields than usual. The earliest variety was ready for the first picking on August 4, and the latest variety on August 29. The table gives the yield and other particulars of the highest-yielding fifteen varieties. Banting, Pickaninny and Early Malcolm are good early varieties, and Golden Sunshine and Golden Bantam good main-crop varieties.

CORN—RESULTS OF TEST OF VARIETIES

Variety and source of seed	Height	Date 10 per cent ready for use	Number of cars			Weight of 25 average ears	
			Marketable	Fair	Poor		
	ft.					lb.	oz.
Earliest Catawba (Burpee)	$6\frac{1}{2}$	Aug. 26	164	43	54	10	0
Early Malcolm (C.E.F.)	6	Aug. 16	140	14	51	13	0
Buttercup (Harris)	7	Aug. 20	127	8	25	11	8
Banting (C.E.F.)	$4\frac{1}{2}$	Aug. 6	122	17	67	8	4
Pickaninny (C.E.F.)	$3\frac{1}{2}$	Aug. 2	121	29	.....	7	8
Golden Country Gentleman (Henderson)	6	Aug. 29	115	19	41	10	8
Golden Bantam (Moore)	$6\frac{1}{4}$	Aug. 14	113	2	22	10	0
Seymour Sweet Orange (Burpee)	$6\frac{1}{2}$	Aug. 20	109	18	26	13	0
Alpha (Harris)	5	Aug. 4	106	9	39	11	0
New First In (Schell)*	6	Aug. 12	105	23	20	13	0
Golden Bantam (Graham)	$6\frac{1}{2}$	Aug. 20	104	23	32	13	0
Burbank (Stark)	7	Aug. 21	103	31	47	16	0
Early Bantam (Harris)	$6\frac{3}{4}$	Aug. 10	101	12	31	13	8
Golden Bantam (McD.)	$6\frac{3}{4}$	Aug. 18	99	15	27	11	0
Burpee (Burpee)	5	Aug. 10	93	10	72	12	8

* From 33-foot row.

SUCKERING TEST.—Two varieties, Early Malcolm and Golden Bantam, were grown as detailed above, two rows of each variety. In one row the suckers were removed and in the other were allowed to remain. The yield of marketable ears was larger in one case where the suckers were removed, and in the other where the suckers were left on.

CORN—RESULTS OF SUCKERING TEST

Variety and source of seed	Number of ears		
	Marketable	Not marketable	Undeveloped
Early Malcolm (C.E.F.)—Suckers left on	92	17	16
Suckers taken off	85	5	17
Golden Bantam (Moore)—Suckers left on	68	7	19
Suckers taken off	71	4	19

CUCUMBERS

TEST OF VARIETIES.—Ten varieties of cucumber were sown May 29 in plots 8 feet by 16½ feet, 12 plants of each variety to a plot. Two pickling varieties and one gherkin were sown in plots 10 feet by 33 feet, 26 plants of each to a plot. The yields of the different sorts are given in the table. Improved Long Green, Early White Spine and Davis Perfect are good varieties for general use, and Snow Pickling for pickling.

CUCUMBERS—RESULTS OF TEST OF VARIETIES

Variety and source of seed	Length of 12 average fruit	Weight of fruit					
		Mature		Immature		Total	
	in.	lb.	oz.	lb.	oz.	lb.	oz.
Improved Long Green (McDonald)	9	160	2	6	6	166	8
Early White Spine (Burpee)	5½	148	12	5	4	154	0
Early Fortune (Bruce)	8½	132	4	8	12	141	0
Davis Perfect (Graham)	10	130	2	6	0	136	2
Long White Spine (Stokes)	12	130	0	5	10	135	10
XXX Table (Rennie)	10½	124	2	7	2	131	4
Perfection (Harris)	9½	120	2	5	4	125	6
Double Yield (Harris)	8½	105	2	15	2	120	4
Early Fortune (Rice)	8½	106	0	7	14	113	14
China (Harris)	22½	95	12	8	8	104	4
Pickling							
Jersey Pickling (Ferry)	3	113	12	48	2	161	14
Snow Pickling (Rennie)	3	113	12	45	5	159	1
West India Gherkin (Burpee)	2	75	12	.....		75	12

LETTUCE

TEST OF VARIETIES.—Twelve varieties were sown May 1 in 16½-foot rows, the rows 2 feet apart. Certain plants of each variety were transplanted to other rows on June 12, making the plants in both sets of rows 10 inches apart in the row. The yields under both treatments are given in the table. Good varieties to grow are: open head, Grand Rapids; curled head, Iceberg; cabbage head, All Heart and Crisp As Ice; Cos, Paris White Cos.

LETTUCE—RESULTS OF TEST OF VARIETIES

Variety and source	Ready for use		Number of days to maturity		Weight of three average heads	
	Thinned	Transplanted	Thinned	Transplanted	Thinned	Transplanted
					lb. oz.	lb. oz.
Black Seeded Simpson (Ewing)	July 4	July 16	64	76	2 5	2 5
Denver Market (Vaughan)	July 6	July 26	66	86	1 11	2 14
Grand Rapids (Burpee)	July 6	July 16	66	76	1 4	2 5
Prize Head (Burpee)	July 6	July 25	66	85	2 11	1 14
All Heart (Dreer)	July 10	July 24	70	84	3 0	2 6
Salamander (McD.)	July 12	July 24	72	84	3 0	2 6
New York (Graham)	July 12	July 28	72	88	4 4	3 4
Crisp as Ice (Wills)	July 12	July 26	72	86	2 6	1 14
Iceberg (Ewing)	July 12	July 30	72	90	4 8	2 12
Paris White Cos (Graham)	July 15	Aug. 2	75	93	6 0	6 0
Brittle Ice (Burpee)	July 16	July 30	76	90	5 1	3 2
Early Paris Market (Ott. 4459)*	.....	.....	.....	.....	.....	.....

*Seeded prematurely.

SUCCESSIONAL SOWING.—Sowings were made inside on March 25 and April 17, and in the field at intervals from May 1 to August 8. The plants were grown in rows 16½ feet long and 2 feet apart, the plants 10 inches apart in the row. The yields from the different sowings are given in the table.

LETTUCE—RESULTS FROM SUCCESSIONAL SOWINGS

Variety and source of seed	Date sown	Number days to maturity	Weight of three average heads	
			lb.	oz.
All Heart (Dreer)	Mar. 25	82	1	6
	April 17	69	2	6
	May 1	68	3	0
	June 19	33	2	8
Black Seeded Simpson (Ewing)	Mar. 25	77	1	7
	May 1	64	2	5
	May 23	50	2	2
	June 19	50	1	10
	Aug. 8	.....	*	
Crisp as Ice (Wills)	Mar. 25	81	1	6
	April 17	67	2	6
	May 1	72	2	6
	May 23	57	2	2
	June 19	63	2	2
	Aug. 8	.....	*	
Grand Rapids (Burpee)	Mar. 25	77	1	6
	April 17	62	2	4
	May 1	64	1	4
	May 23	50	2	4
	June 19	50	1	10
	Aug. 8	.....	*	
Iceberg (Ewing)	Mar. 25	87	3	7
	April 17	72	3	11
	May 1	72	4	8
	May 23	64	2	14
	June 19	62	3	4
New York (Graham)	Mar. 25	84	3	1
	May 1	72	4	4
	May 23	57	3	5
	June 19	63	3	0
Paris White Cos (Graham)	Mar. 25	92	5	6
	May 1	75	11	8
	May 23	.....	*	
	June 19	.....	*	
Salamander (McDonald)	Mar. 25	83	2	6
	May 1	72	3	0
	June 19	56	†	
	Aug. 8	63	†	

*No heads marketable Oct. 10.
†No weights taken.

ONIONS

TEST OF VARIETIES.—In order to have good, strong plants able to withstand the cold weather when set out, and the attack of the root maggot, it is advisable to sow the seed inside early, from the middle to the end of February being probably the best time. It is difficult to control this maggot with a poison solution so that early sowing inside seems advisable for large crops. This year the field sown onions did fairly well, the maggot not being so troublesome, and a record of the yields of this sowing, made April 30, is given below. The yields are from single rows 16½ feet long, the rows 13 inches apart, and the plants 3 inches apart in the row. Good varieties are: for outside seeding, Early Flat Red, Yellow Globe Danvers, and Cranston Excelsior; for pickling, White Portugal, sown thickly; for sowing inside and transplanting, Cranston Excelsior and Prizetaker.

ONIONS—RESULTS OF TEST OF VARIETIES, SOWN IN FIELD ON APRIL 30

Variety and source of seed	Number of marketable bulbs	Weight of marketable bulbs		Number of unmarketable bulbs
		lb.	oz.	
Denia (D. & F.)	41	15	8	6
Early Flat Red (Kentville)	54	15	0	5
Southport Red Globe (Steele, Briggs)	46	14	0	7
Mammoth Prizetaker (D. & F.)	46	14	0	2
Cranston Excelsior (Ewing)	42	14	0	8
Large Red Wethersfield (McDonald)	43	13	8	8
Large Red Wethersfield (D. & F.)	46	12	8	10
Large Red Wethersfield (Ott. 3882)	58	12	0	6
Giant Prizetaker (Steele, Briggs)	36	11	8	5
Ailsa Craig (Graham)	33	10	8	9
White Portugal (McDonald)	68	10	0	6
Southport White Globe (Steele Briggs)	50	10	0	0
Southport Red Globe (Graham)	39	9	0	8
Red Wethersfield (Graham)	35	8	0	3
Southport Red Globe (D. & F.)	30	7	8	3
Silver King (Graham)	32	7	8	18
Danvers Yellow Globe (Steele, Briggs)	29	7	0	14
Barletta (D. & F.)	.....	5	4	.....
Barletta (Graham)	.....	5	2	.....
Danvers Yellow Globe (Graham)	20	5	0	17
Danvers Yellow Globe (James)	16	4	0	20
Flat Red (Graham)	28	4	0	18

PLANTING DIFFERENT DISTANCES APART.—Four varieties sown inside on Feb. 11 were planted in the field May 14, in rows $8\frac{1}{4}$ feet long and 13 inches apart, two rows of each variety. In one row the plants were set 3 inches apart, and in the other row 6 inches apart. It will be noted that in three out of the four varieties the better yields came from the row in which the plants were 6 inches apart.

ONIONS—RESULTS FROM PLANTING DIFFERENT DISTANCES APART

Variety and source of seed	Distance apart	Number of marketable bulbs	Weight of marketable bulbs		Number of unmarketable bulbs
	in		lb.	oz.	
Southport Red Globe (D. & F.)	3	27	12	0	1
	6	18	11	8	.....
Cranston Excelsior (D. & F.)	3	22	13	0	.....
	6	17	19	8	.....
Large Red Wethersfield (D. & F.)	3	22	10	0	3
	6	17	13	8	.....
Yellow Globe Danvers (D. & F.)	3	19	12	0	.....
	6	17	13	0	.....

STORAGE TEST.—Twenty-five average bulbs from sowings in February and March were stored in a cool cellar Oct. 3. Yellow Globe Danvers and Selected Red Wethersfield kept considerably better than the others.

MULTIPLIER ONIONS.—The multiplier onion is a small, firm, late-keeping onion very suitable for the home garden. It increases by dividing into several sections, whence the name. Small, medium and large sections were planted, and, as is usual, the yield was practically the same from each size. The small divisions may thus be used satisfactorily for planting, being put aside for that purpose as the onions are used. Further, the larger sections are more apt to go to seed during the summer.

PARSNIPS

TEST OF VARIETIES.—Seven varieties and strains were sown May 1, and thinned to 4 inches apart in $16\frac{1}{2}$-foot rows, the rows 2 feet apart. They were harvested on October 8, with yields as given in the table. Hollow Crown is one of the best varieties.

PARSNIPS—RESULTS OF TEST OF VARIETIES

Variety and source of seed	Number of roots marketable	Weight of marketable roots		Number of roots not marketable
		lb.	oz.	
Evesham (Gates)	55	20	8	4
Hollow Crown (D. & F.)	48	19	8	.....
Elcome Improved Hollow Crown (Graham)	42	19	0	6
Hollow Crown (Graham)	35	16	0	4
Cooper Champion (D. & F.)	53	15	8	4
Dobbie Selected (D. & F.)	43	13	8	4
Dobbie Selected (Ewing)	40	10	8	8

SUCCESSIONAL SOWINGS.—Five successional sowings were made, with yields as given in the table from rows 15 feet long and 2 feet apart. The roots from the June sowing are somewhat small, so that towards the end of May would seem to be the best date to sow.

PARSNIPS—RESULTS FROM SUCCESSIONAL SOWINGS

Variety and source of seed	Date sown	Number roots marketable	Weight of marketable roots		Number of roots not marketable
			lb.	oz.	
Hollow Crown (Graham)	May 1	35	16	0	4
	May 12	44	10	8	4
	May 20	46	10	8	.....
	May 30	48	10	0	9
	June 9	38	7	0	29

PEAS

TEST OF VARIETIES.—Twenty-two varieties and strains were sown April 30 in 33-foot rows 3½ feet apart, one row of each variety for green peas and one row for seed. The table gives the yields and other particulars of the highest-yielding fifteen varieties. Thomas Laxton and Blue Bantam are good early varieties; Director, Bruce, and Kootenay good main-crop varieties, and Stratagem and Daisy or Dwarf Telephone good late varieties.

PEAS—RESULTS OF TEST OF VARIETIES

Variety and source of seed	Height	Ready for use	Weight of green pods		Yield of seed		Per cent moth injury in seed
	ft.		lb.	oz.	lb.	oz.	%
Stratagem (Rennie)	2½	July 12	24	4	6	0	24
No. 42 (Invermere)	2½	July 12	24	0	3	6	26
Bruce (Invermere)	3	July 12	23	0	6	6	21
Lincoln (Patmore)	2	July 8	22	10	5	4	20
Quite Content (Vaughan)	4	July 8	20	14	5	2	21
Telephone (McDonald)	4½	July 12	20	12	4	12	23
Lincoln (Sharpe)	1¾	July 8	17	2	3	8	15
Director (Invermere)	2½	July 4	16	12	4	2	27
Daisy or Dwarf Telephone (Patmore)	3	July 12	15	10	3	10	29
Lincoln (Invermere)	1¾	July 4	15	10	2	12	23
McLean Advancer (Ferry)	2	July 8	14	9	3	2	9
No. 6 (Invermere)	3	July 4	13	12	1	4	25
Kootenay (Invermere)	4	July 12	13	2	2	14	18
Gradus x American Wonder (Ott. 4143)	4	July 2	10	15	2	4	25
Laxton Superb (McKenzie)	1¾	July 2	10	6	1	6	33

GROWN AT DIFFERENT DISTANCES APART.—Three varieties were each thinned to 1, 2 and 3 inches apart in rows 33 feet long. With two of the varieties the highest yields were from the 1-inch-apart rows.

PEAS—RESULTS FROM PLANTING DIFFERENT DISTANCES APART

Variety and source of seed	Distance apart in rows	Total yield of green pods	
		lb.	oz.
English Wonder (C.E.F.)	1	6	12
	2	9	4
	3	12	8
Thomas Laxton (McDonald)	1	12	0
	2	9	12
	3	8	14
Stratagem (C.E.F.)	1	25	2
	2	21	12
	3	23	10

POTATOES

SPROUTED VS. UNSPROUTED SEED.—The variety Irish Cobbler, put in the greenhouse April 2, and allowed to sprout in full light, was compared with tubers of the same variety planted in the field direct from the cellar on April 2 and others planted May 3.

Six hills from each lot were dug at different dates. The heaviest yield of tubers to August 2, and also the heaviest total yield was from tubers sprouted in the greenhouse. The yields as given below are from single rows $8\frac{1}{4}$ feet long, the rows 3 feet apart and the plants 15 inches apart in the row.

POTATOES—RESULTS FROM SPROUTED VS. UNSPROUTED SEED TEST

Date of digging	Number of marketable tubers	Weight of marketable tubers		Weight of tubers not marketable	
		lb.	oz.	lb.	oz.
Sprouted in Greenhouse					
July 12	36	4	10	0	8
July 19	42	9	8	0	6
July 25	45	9	4	0	6
August 2	40	9	12	0	6
August 9	44	11	8	0	6
September 29	42	15	8	0	4
Totals	249	60	2	2	4
From Cellar Direct, April 2					
July 12	27	2	6	0	10
July 19	40	7	0	0	6
July 25	44	8	4	0	10
August 2	45	9	8	0	10
August 9	52	11	0	1	0
September 29	54	14	0	0	12
	262	52	2	4	0
From Cellar Direct, May 3					
July 12	18	2	0	1	0
July 19	43	6	8	0	12
July 25	46	9	4	0	2
August 2	51	9	8	0	10
August 9	54	11	8	1	0
September 29	38	10	0	1	2
	250	48	12	4	10

PUMPKIN, SQUASH, AND VEGETABLE MARROW

TEST OF VARIETIES.—Four varieties and strains of pumpkin, nine of squash, and four of vegetable marrow were sown May 29, in plots 12 by 16½ feet, ten plants to a plot. The yields, etc., are given in the table. Small Sugar is an excellent small pumpkin and Connecticut a good main-crop variety. Golden Hubbard and Green Hubbard are two of the best squashes and Long White Bush one of the best vegetable marrows.

PUMPKIN, SQUASH AND VEGETABLE MARROW—RESULTS OF TEST OF VARIETIES

Variety and source of seed	Number of plants	Number of fruit harvested	Weight of fruit harvested	
			lb.	oz.
Pumpkin				
Connecticut (McDonald)	10	17	265	0
Pie (Brand)	10	48	229	0
Small Sugar (Ott. 11015)	10	54	228	0
Small Sugar (Graham)	10	32	206	0
Squash				
Boston Marrow (McDonald)	10	16	229	0
Warted Hubbard (Rice)	10	14	184	8
Hubbard Green (Graham)	10	14	166	12
Hubbard (McDonald)	10	13	162	0
Kitchenette (Vaughan)	10	17	159	8
Golden Hubbard (McDonald)	10	19	144	0
Golden Hubbard (Ott. 4884)	10	16	93	0
Blue Hubbard (Rice)	10	7	90	8
Acorn (Buckbee)*	6	49	65	10
Vegetable Marrow				
English Vegetable Marrow Trailing (Steele, Briggs)	10	27	208	0
Cocozelle (Vaughan)	10	30	115	8
White Bush Scallop (Graham)	10	42	115	0
Long White Bush (McDonald)	10	19	97	8

* Row 16½ feet long.

FORCING RHUBARB IN THE GREENHOUSE

Three roots each of rhubarb plants grown from seed (Ruby Ott. 45) sown in 1924, 1925, 1926, 1927 and 1928 were lifted in late November, and allowed to freeze outside until January 12. They were then stored in the cool end of the greenhouse under a bench, with some soil around the roots, and the space curtained off from the light. The first stalks were ready for use on February 14, and the last picking was April 4. It would appear that the age of the root makes little or no difference in the earliness of the forcing, but the older roots give the larger yields.

TOMATOES

TEST OF VARIETIES.—Thirty-one varieties and strains were sown in the greenhouse March 28, and set out to the field May 26, six plants of each variety, in rows 5 feet apart, the plants spaced 4 feet apart in the row. The table gives the yields of both ripe and green fruit of the highest-yielding fifteen varieties. Alacrity x Earlibell, Alacrity, Herald, and Bonny Best are good varieties.

TOMATOES—RESULTS OF TEST OF VARIETIES

Variety and source of seed	Weight of marketable fruit first fourteen days	Weight of fruit						Total weight ripe and green fruit	
		Marketable				Unmarketable			
		Ripe		Green					
	lb. oz.	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.
Landreth (Landreth)	10 14	182	14	2	4	39	4	185	2
Nova Scotia (New Glasgow)	6 6	156	2	17	6	34	2	173	8
Earliana (Moore)	53 6	171	8	0	0	63	0	171	8
Langportonian (Kelway)	9 6	144	6	22	8	31	6	166	14
Heterosis (D. &F.)	10 0	117	0	37	0	45	2	154	10
Pink No. 1 (Ott. 973)	6 8	114	8	39	0	25	8	153	8
John Baer (Andrewes Mountain)	6 0	133	4	12	0	26	8	145	4
The Burbank (Stark)	26 4	143	14	0	0	45	4	143	14
Jewel (Langdon)	5 0	133	0	9	0	34	0	142	0
Bonny Best (Stokes)	19 4	131	12	9	8	45	6	141	4
Bonny Best (Keith)	9 0	130	12	10	0	26	12	140	12
Earliana (Grade 3 (Langdon)	28 2	138	4	0	0	61	2	138	4
Herald (Ott. 9726)	47 14	134	6	0	4	59	6	134	10
Success (Harris)	23 12	122	4	3	8	30	10	125	12
Alacrity (Ott. 6365)	33 6	124	10	0	4	58	4	124	14

TRAINING TO SINGLE STEMS AND STAKING.—Two varieties were planted in rows 2½ feet apart, the plants one foot apart in the row and tied to stakes, all laterals being kept removed. Certain plants were cut off above the second, third, and fourth trusses of fruit respectively, and others were allowed to grow full length, twenty plants of each, and these are compared in the table with three bush plants, which occupied approximately the same space as twenty plants trained to single stems. It will be noted that, as might be expected, the full-grown trained plants gave almost twice the yield of the bush plants. It will also be noted that, the more thorough the pruning, the greater the yield of ripe fruit in the first two weeks, but the smaller the total yield of ripe fruit and the total yield of fruit of all kinds. As the pruning and staking take considerable time this practice is probably of value only in the home garden.

TOMATOES—RESULTS OF DIFFERENT TREATMENTS

Variety and how trained	Ready to use	Weight of marketable fruit first fourteen days	Weight of fruit						Total weight ripe and green fruit	
			Marketable				Unmarketable			
			Ripe		Green					
Alacrity (C.F.F.)		lb. oz.	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.
Single stem, two trusses	July 30	14 8	42	4	0	0	10	8	42	4
Single stem, three trusses	July 28	16 0	60	4	0	0	21	6	60	4
Single stem, four trusses	Aug. 2	8 8	92	14	2	12	29	4	95	10
Single stem, full grown	July 30	23 4	108	4	7	0	41	10	115	4
Bush plants	.....	11 11	62	5	0	2	29	2	62	7
Bonny Best (Stokes)										
Single stem, two trusses	Aug. 30	23 12	46	12	0	0	7	6	46	12
Single stem, three trusses	Aug. 30	7 2	79	0	0	0	38	12	79	0
Single stem, four trusses	Aug. 30	12 10	105	6	1	6	24	12	106	12
Single stem, full grown	Aug. 30	10 8	122	6	2	2	34	6	124	8
Bush plants	.....	9 2	65	14	4	12	22	11	70	10

PAPER MULCH

Extensive tests of the value of mulch paper in vegetable growing are being carried on over a three-year period, and will be reported on at the end of the period.

CEREALS

Some ploughing was done at this Station April 19, and the first grain, one and one-half acres of Huron wheat, was seeded April 30. Farm work was general by May 3, and the larger fields of oats, barley and wheat were seeded from May 9 to May 20. Sixteen varieties of wheat, 17 of oats and 31 of barley were tested by the rod-row system; these were seeded May 7 and 8. The condition of the land at this time was good, germination was rapid, and the stand of plants was excellent. The precipitation for May and June was 2·09 inches less than normal. The rainfall for July was above the average but fell in the first half of the month. August and September were very dry, and ideal for grain harvesting. The last of the grain was harvested August 22.

The total grain harvested at this Station was: oats, 803 bushels; barley, 55 bushels; wheat, 32 bushels.

TEST OF VARIETIES

Thirty-one varieties of barley, 17 of oats and 16 of wheat were tested by the rod-row system, which furnishes a good index as to yield and general suitability of the various grains.

The field tests this season were confined to three varieties of oats, one of wheat and one of barley. The yields were lighter than usual owing to the extremely dry season.

In the tables below will be found the yields per acre and other particulars for 1930, and the relative yields for the years 1914 to 1930.

CEREALS, TEST OF VARIETIES

Variety and source of seed	When ripe	Number of days to maturity	Height	Yield per acre	
			in.	lb.	bush.
Oats—					
Victory	Aug. 4	88	41	1,924	56·6
Alaska	July 28	81	33	962	28·3
Liberty	July 28	81	35	860	25·3
Banner	Aug. 3	87	39	1,570	46·2
Barley—					
Charlottetown No. 80	Aug. 8	80	39	1,641	34·2
Wheat—					
Huron (St. Anne de la Pocatière)	Aug. 17	97	43	1,338	22·3

RELATIVE YIELDS OF VARIETIES OF OATS, 1914–1930

Year	Yield of Banner per acre	Percentage of yield of Banner Ott. 49 (Banner=100)			
		Victory	Daubeney (Ott. 47)	Liberty (Ott. 480)	Alaska (Ott. 10307)
	lb.				
1914	1,981	.....	90·6	.....	.....
1915	1,872	108·8	63·5	.....	.....
1916	1,474	120·2	98·3	59·7	.....
1917	1,487	95·8	87·4	57·3	.....
1918	2,595	95·6	89·0	58·9	.....
1919	2,423	117·2	.....	47·5	.....
1920	2,530	102·1	.....	61·9	.....
1921	1,776	118·0	.....	108·5	.....
1922	2,052	108·2	.....	72·1	.....
1923	1,788	123·3	.....	66·1	.....
1924	2,594	105·1	.....	68·6	.....
1925	2,065	99·4	.....	69·4	70·8
1926	1,528	121·4	.....	105·2	90·1
1927	1,848	108·6	.....	40·2	66·6
1928	2,001	103·6	.....	69·3	78·0
1929	1,564	126·1	.....	80·9	.....
1930	1,570	122·5	.....	54·8	61·3

RELATIVE YIELDS OF VARIETIES OF BARLEY, 1916-1930

Year	Yield of Charlottetown No. 80 (2-row) per acre	Percentage of yield of Charlottetown No. 80				
		Charlottetown 80=100				
		Duckbill Ott. 57 (2-row)	Gold Swedish (2-row)	Manchurian Ott. 50 (6-row)	Canadian Thorpe (6-row)	Mensury Ott. 60 (6-row)
1916	1,408	.....	.....	72·7	66·6	.....
1917	1,060	.....	.....	70·5	81·1	.....
1918	1,623	.....	.....	88·7	73·6	.....
1919	1,873	93·9	.....	84·8	.....	.....
1920	1,797	69·4	.....	62·3	.....	.....
1921	1,912	61·7	.....	.....	.....	.....
1922	2,171	68·2	.....	.....	.....	52·5
1923	1,122	62·8	.....	.....	.....	87·1
1924	1,789	100·7	.....	.....	.....	103·8
1925	1,575	61·1	.....	.....	.....	90·6
1926	1,936	73·1	52·8	.....	.....	68·1
1927	784	88·7	103·1	.....	.....	136·7
1928	1,740	.....	53·2	.....	.....	59·5
1929	1,455	.....	74·5	.....	.....	74·5
1930	1,641	41·2	.....	.....	.....	52·1

RELATIVE YIELDS OF VARIETIES OF WHEAT, 1914-1930

Year	Yield of Marquis per acre	Percentage of yield of Marquis Ott. 15		
		Marquis=100		
		Huron (Ott. 3)	Red Fife (Ott. 17)	Charlottetown No. 123
	lb.			
1914	1,575	.....	87·9	.....
1915	994	.....	102·4	.....
1916	1,107	.....	95·3	.....
1917	899	.....	96·6	.....
1918	1,273	130·4	115·3	.....
1919	1,489	97·3	107·4	.....
1920	1,245	99·9	111·8	.....
1921	1,294	110·6	105·2	.....
1922	947	99·2	84·2	.....
1923	606	95·0	82·1	.....
1924	1,780	60·4	82·1	81·9
1925	1,199	90·6	94·1	90·0
1926	748	176·4	144·3	.....
1927	432	261·1	.....	.....
1928	1,150	150·1	.....	.....
1929	1,116	125·4	.....	.....
1930	633	211·4	.....	.....

FORAGE PLANTS

FIELD ROOTS—TEST OF VARIETIES AND STRAINS

The land on which these were grown had been in roots in 1929, and was ploughed that fall. It was manured at the rate of 20 tons per acre in the spring of 1930, again ploughed, disked, and received a broadcast application of a 5-9-8 fertilizer at the rate of 700 pounds per acre. This was well cultivated in, and rows were run with the horse hoe and lightly rolled down. Carrots were seeded May 16; mangels, May 17, and turnips, May 29. Mangels were harvested October 24, and carrots and turnips, October 31 and November 1. The green weight and the absolute dry matter per acre are given in the following tables.

CARROTS—RESULTS OF TEST OF VARIETIES AND STRAINS

Variety and source of seed	Average yield per acre				
	Green weight			Dry matter	
	tons	lb.	bush.	tons	lb.
White Half Long (McFayden)	10	1,600	432·0	1	1,380
Mammoth White Intermediate (Rennie)	9	1,440	388·8	1	1,140
Ontario Champion (Graham Bros.)	9	1,680	393·6	1	760
Long Red Surrey (Steele Briggs)	8	60	321·2	1	750
Long Orange Belgian (Rennie)	6	1,680	273·6	1	580
Improved Danvers (Graham Bros.)	8	1,040	340·8	1	560
Danish Champion (C.E.F.)	7	1,120	302·4	1	500
New Yellow Intermediate (Ewing)	9	720	374·4	1	300
Large White Vosges (Graham Bros.)	7	1,360	307·2	0	1,880
Improved White Vosges (McDonald)	6	1,200	264·0	0	1,780
White Belgian (Dupuy & Ferguson)	6	1,440	268·8	0	1,740
Improved Short White (McDonald)	4	880	177·6	0	1,440
Improved Intermediate White (Ewing)	4	160	163·2	0	1,020

MANGELS—RESULTS OF TEST OF VARIETIES AND STRAINS

Variety and source of seed	Average yield per acre				
	Green weight			Dry matter	
	tons	lb.	bush.	tons	lb.
Yellow Intermediate (C.E.F.)	19	160	763·2	3	740
Giant White Feeding (Steel Briggs)	16	400	648·0	2	1,880
Danish Sludstrup (Ewing)	15	720	614·4	2	1,760
Sludstrup Barres (H. Hartman Co.)	18	1,744	754·9	2	1,540
Yellow Leviathan (Ewing)	15	1,680	633·6	2	1,440
Eclipse (McKenzie)	15	1,440	628·8	2	1,120
Stryno Barres (H. Hartman Co.)	17	80	681·6	2	920
Yellow Intermediate (Sutton)	16	1,600	672·0	2	920
Mammoth Long Red (Deputy & Ferguson)	16	400	648·0	2	800
Danish Sludstrup (Dupuy & Ferguson.)	17	560	691·2	2	580
Improved Giant Sugar (Rennie)	15	1,920	638·4	2	420
Red Tankard (K. McDonald)	18	240	724·8	2	420
Eckendorfer Red (H. Hartman Co.)	15	960	619·2	2	400
Elvethan Mammoth (H. Hartman Co.)	14	560	571·2	2	320
Elvethan Long Red (Sutton)	15	1,440	628·8	2	220
Gate Post (Bruce)	17	1,040	700·8	2	200
Eckendorfer Yellow (H. Hartman Co.)	18	720	734·4	2	160
Golden Tankard (Dupuy & Ferguson)	13	1,840	556·8	1	1,980
Taaroje Barres (H. Hartman Co.)	20	560	811·2	1	1,840
Giant Yellow Globe (Rennie)	13	400	528·0	1	1,780
Improved Tankard Cream (Rennie)	16	400	648·0	1	1,600
Jumbo Sugar Beet (Rennie)	18	960	739·2	1	1,600
Fjerritslev Barres (H. Hartman Co.)	16	1,640	672·8	1	1,400

TURNIPS—RESULTS OF TEST OF VARIETIES AND STRAINS

Variety and source of seed	Average yield per acre			
	Green weight		Dry matter	
	tons lb.	bush.	tons	lb.
Bangholm (Studsgaard)	14 1,040	580·8	2	180
Wilhelmsburger (D. L. F.)	17 1,280	705·6	2	60
Bangholm (Lyngby) (D. L. F.)	13 1,840	556·8	2	20
Invicta Bronze Top (Ewing)	15 240	604·8	1	1,880
Sutton Champion Purple Top (Rennie)	15 240	604·8	1	1,700
Derby Bronze Green Top (Rennie)	15 1,200	624·0	1	1,700
Bangholm (Exp. Farm, Nappan)	13 400	528·0	1	1,660
Bangholm (Lyngby x Studsgaard) (D.L.F.)	13 1,600	552·0	1	1,600
Kangaroo Bronze Top (Rennie)	16 1,600	672·0	1	1,560
Best of All (Rennie)	15 1,680	633·6	1	1,540
Good Luck (Steele, Briggs)	15 1,440	628·8	1	1,520
Hartley Bronze Top (Rennie)	15 720	614·4	1	1,500
Selected Westbury (Steele, Briggs)	14 1,760	595·2	1	1,440
Bangholm (Kentville)	12 480	489·6	1	1,380
Jumbo or Elephant (Rennie)	15 0	600·0	1	1,320
Kangaroo (Steele, Briggs)	15 960	619·2	1	1,320
Bangholm (Dupuy & Ferguson)	16 400	648·0	1	1,280
Bangholm Purple Top (Rennie)	15 0	600·0	1	1,280
Favourite (Dupuy & Ferguson)	17 800	696·0	1	1,260
Up to Date (Sutton)	16 1,600	672·0	1	1,140
Champion Purple Top (Graham)	13 1,600	552·0	1	1,120
Ne Plus Ultra (Dupuy & Ferguson)	17 560	691·2	1	1,100
Crimson King (Sutton)	13 160	523·2	1	1,100
Best of All (Graham)	15 1,440	628·8	1	1,060
New Century (Rennie)	13 1,840	556·8	1	1,000
Magnum Bonum (Rennie)	14 560	571·2	1	1,000
New Universal Purple Top (Dupuy & Ferguson)	14 1,280	585·6	1	960
Halls Westbury (Rennie)	13 880	537·6	1	960
Canadian Gem (Rennie)	14 1,760	595·2	1	920
Durham (Steele, Briggs)	13 400	528·0	1	820
Canadian Gem (Steele, Briggs)	12 0	480·0	1	280
Ditmars (McNutt) (seeded late)	10 200	404·0	1	240

SUGAR BEETS—TEST OF VARIETIES

These were grown on land which had been used for roots in 1929. It was fall ploughed, manured in spring at the rate of 20 tons per acre, again ploughed, and disked. A 5-9-8 fertilizer at the rate of 700 pounds per acre was then applied broadcast. Rows were run with the horse hoe and lightly rolled down, and the seed sown with the garden drill, May 17. The crop was harvested October 24. The yield per acre of green material and also of absolute dry matter is given in the following table, together with the percentage of sugar in the juice, for each variety.

SUGAR BEETS—RESULTS OF TEST OF VARIETIES

Variety and source of seed	Average yield per acre				Per cent of sugar in juice	Co-efficient of purity	Average weight of one root
	Green weight			Dry matter			
	tons lb.	bush.	tons lb.		%		lb. oz.
Rabbethge (Chemistry Division)	12 480	439·6	3 820		20·43	90·95	1 9
Dippe (Chemistry Division)	11 1,280	465·6	3 320		20·06	89·02	1 3
Fredericksen (Chemistry Division)	11 360	447·2	2 1,540		21·13	92·49	1 4

CORN FOR ENSILAGE—TEST OF VARIETIES AND STRAINS

Sixteen varieties and strains were grown on land which had been ploughed last fall. In the spring of 1930 it was manured at the rate of 20 tons per acre, again ploughed, and disked. A 5-9-8 fertilizer at the rate of 700 pounds per

acre was then applied and cultivated in. The corn was seeded May 30, and harvested September 3. The yields of green material and also of absolute dry matter are given in the table.

CORN FOR ENSILAGE—RESULTS OF TEST OF VARIETIES AND STRAINS

Variety and source of seed	Average height	Stage of maturity at harvest	Average yield per acre			
			Green weight		Dry matter	
	ft.		tons	lb.	tons	lb.
Yellow Dent (Wimple)	6	Early milk	16	640	3	1,520
Leaming No. 9 (Duke)	6½	Late milk	14	1,280	3	960
Pride Yellow Dent (D.I.S. Co.)	6½	Late milk	16	1,360	3	800
Hybrid (Wimple)	6½	Late milk	16	400	3	500
Sweepstake (J. Harris)	6¼	Silk	15	960	3	400
Northwestern Dent (D.I.S. Co.)	5	Early dough	13	1,820	3	20
Burr Leaming (Carter)	6½	Silk	16	1,120	2	1,940
Pride of the North (Lot 3236) (D.I.S. Co.)	6¼	Early milk	14	560	2	1,460
Bailey (Duke)	6½	Early milk	13	1,360	2	1,460
Amber Flint (Wimple)	6	Early dough	14	1,280	2	1,420
Golden Glow (Duke)	5¾	Early milk	12	1,200	2	1,400
Wisconsin No. 7 (Duke)	6¼	Early milk	12	1,680	2	1,400
Longfellow (Duke)	6	Early milk	13	1,360	2	1,180
Ninety Day White Dent (D.I.S. Co.)	5	Early milk	11	1,280	2	1,040
North Dakota White Flint.. (Steele, Briggs)	6	Early silk	11	1,520	2	340
Northwestern Dent (E. F., Brandon)	5	Early dough	8	320	1	1,720

A good clover stand.

SOY BEANS—TEST OF VARIETIES

In the table below will be found the results of the test with different varieties of soy beans in 1930. Many inquiries reach this Station as to the value of this crop as an annual hay, and tests of a number of varieties have been conducted here since 1923. The average yield per acre of green material has

been 3·64 tons per acre, with an average dry matter content of 33 per cent, giving a yield of 1·38 tons per acre of hay containing 15 per cent moisture. Among the higher yielding varieties have been Ito San, Black Eyebrow, A.K., Mammoth Yellow, Hollybrook and O.A.C. 211. This plant does fairly well on many types of soil, the best results being obtained on mellow, fertile loams or sandy loams. The soil requirements are about the same as for corn, and the seed should be planted about the same time as corn, after the ground has warmed up somewhat. Inoculation has proved beneficial when the crop is grown on land which has not previously grown soy beans. The amount of seed required per acre varies according to the size of the seed sown. With fairly large seed sown in rows two feet apart about 50 pounds per acre are needed.

This crop cannot compete with the clover crop in the production of feed for cattle, but there may be times, clover having failed, when it might be advisable to seed soy beans.

The land on which the test was conducted in 1930 had been in hemp in 1929 and had been manured for that crop at the rate of 25 tons per acre. No manure or fertilizer was used for the soy beans in 1930. Seeding was done June 5 and the crop was harvested September 23. The yields per acre of both green and absolute dry material are given in the following table.

Soy Beans—Results of Test of Varieties

Variety	Height	Stage of maturity	Average yield per acre				Per cent dry matter
			Green weight		Dry matter		
	in.		tons	lb.	tons	lb.	%
Home-grown seed		Seed inoculated					
Ito San	24	Seed, dough	3	1,920	1	119	26·76
Chinatown Echo	28	Early dough; foliage green	6	0	1	1,270	27·25
Manchu	24	Medium dough; foliage green	3	1,680	1	137	27·83
A. K	28	Early dough; foliage very green	4	640	1	446	28·32
Early Brown	20	Seed, dough; foliage green	1	160	0	881	40·82
Black Eyebrow	30	Beans, just formed; foliage green	5	1,280	1	1,282	29·10
St. Anne No. 92	18	Late dough	1	1,120	0	1,069	34·28
O.A. C. 221	24	Beans just formed; foliage green	3	720	0	1,890	28·13
Ottawa Seed							
A. K	36	Early dough; foliage green	4	460	1	413	27·93
O. A. C. 211	26	Beans formed; foliage green	2	1,280	0	1,588	30·08
Yellow 17	24	Medium dough, foliage very green	4	400	1	746	32·71
Mandarin	15	Late dough; foliage off	1	1,360	0	1,236	36·81
Chinatown Echo	26	Early dough; foliage very green	7	400	2	21	27·93
Early Brown	24	Nearly ripe; foliage off	2	80	0	1,689	41·41
Black Eyebrow	36	Medium dough; foliage fairly green	4	1,600	1	1,168	33·01
Manchu	31	Seed formed: foliage fairly green	4	1,840	1	873	29·20
Home-grown Seed		Seed not inoculated					
Ito San	27	Seed dough	2	1,040	0	1,624	32·23
Chinatown Echo	28	Seed doogh; foliage green	3	720	1	244	33·40
Manchu	34	Seed ripe; foliage, half off	3	240	1	266	36·33
A. K	42	Pods formed; foliage green	5	560	1	1,083	29·20
Early Brown	24	Seed ripe, foliage off	1	1,840	1	152	56·05
Black Eyebrow	32	Nearly ripe; foliage partly off	3	0	1	226	37·11
St. Anne No. 92	26	Very ripe	2	320	0	1,961	45·41
O. A. C. 211	25	Dough; foliage off	3	240	1	169	34·77
Ottawa Seed							
A. K	36	Early dough	5	800	1	1,089	28·61
O. A. C. 211	28	Dough	2	1,520	0	1,945	35·25
Yellow 17	24	Late dough; foliage partly off	1	1,840	0	1,769	46·09
Mandarin	18	Late dough; foliage off	1	400	0	1,169	48·73
Chinatown Echo	30	Dough	3	1,200	1	700	37·50
Early Brown	19	Seed ripe: foliage off	1	880	0	1,650	57·32
Black Eyebrow	24	Nearly ripe; foliage off	1	1,360	0	1,227	36·52
Manchu	28	Seed about ripe; foliage half off	3	1,200	1	601	36·13

Alfalfa seeded 1930—first cut, 1931.

SUMMARY—AVERAGE YIELD PER ACRE, SOY BEANS, 1930

—	Green weight	Dry matter	Average per cent dry matter
	lb.	lb.	%
Home-grown Seed			
Inoculated	7,440	2,137	30·31
Not inoculated	6,120	2,216	38·06
Ottawa Seed—			
Inoculated	7,950	2,467	32·38
Not inoculated	5,400	2,020	40·77

ALFALFA

One acre of alfalfa seeded in 1929 and cut July 2, 1930, yielded 4,556 pounds of cured hay.

GRASSES AND CLOVERS—TEST OF VARIETIES AND STRAINS

These were seeded late in May, 1929, on land which had been in corn in 1928. Manure had been applied for the corn crop at the rate of 20 tons per acre. No manure or fertilizer was applied in 1929 previous to seeding the grasses and clovers. The object of the experiment is to obtain information as to the yield and general suitability for this locality of the various clovers and grasses. The yields, together with notes on winter injury, will be found in the table herewith.

GRASSES AND CLOVERS—RESULTS OF TEST OF VARIETIES AND STRAINS

Variety or source of seed	Average yield per acre				Remarks
	Green weight		Dry matter		
	tons	lb.	tons	lb.	
Red Clovers					
Alta Swede	5	740	1	580	No winter injury
Late Swedish (Svalof)	4	800	1	20	No winter injury
English Red (Sutton)	3	1,680	0	1,920	5 per cent killed out
Kiev 4 (Russian), 1st cutting	3	1,680	0	1,840	No winter injury
Ufa 1 (Russian)	3	1,900	0	1,740	No winter injury
Rosalie	3	1,160	0	1,700	No killing; plants very short
Biisk 3 (Russian)	3	480	0	1,620	No winter injury
Perm. 2 (Russian)	3	1,440	0	1,620	No winter injury
Welsh Red (Sutton)	3	1,440	0	1,600	7 per cent killed out
Violet du nord (France)	3	260	0	1,580	No winter injury
Chateauguay	3	40	0	1,420	No winter injury
Violet du sud (France)	2	1,440	0	1,420	7 per cent killed out
Violet de l'ouest (France)	3	260	0	1,240	3 per cent killed out
St. Clet	2	1,600	0	1,180	No winter injury
White Clovers					
Stryno	0	1,560	0	420	
Ladino	0	1,560	0	380	
Danish Morso	0	1,220	0	320	
Common White	0	900	0	240	
English Wild	0	900	0	220	
Kentish Wild	0	660	0	180	
Alsike Clovers					
Alsike	0	1,420	0	400	60 per cent killed out
Alfalfa					
Baltic	2	240	0	1,340	No winter injury
Crimm (Brooks)	1	1,800	0	1,160	Some winter injury
Grimm (Lyman)	2	20	0	1,300	Some injury at centre of plot
Cossack	1	1,360	0	1,080	Slight injury centre of plot
Ontario Variegated	1	240	0	700	Centre of plot injured
Grasses					
Red Top	1	240	0	1,360	
Meadow Fescue	1	900	0	980	
Orchard Grass	1	240	0	720	
Kentucky Blue Grass	0	1,560	0	640	
Sweet Clovers					
White Blossom	3	480	0	1,660	
Yellow Blossom	2	1,720	0	1,520	
Pasture Mixtures (Pounds per acre seeded)					
Teff Grass (seeded May 31, 1930; cut Aug. 25, 1930)	4	1,360	1	1,217	34·38 per cent dry matter
Timothy, 10; Red clover, 5; Alsike, 5; White clover, 2	3	1,310	1	959	40·43 per cent dry matter
Red clover, 8; Timothy, 8; Alsike, 2	3	840	1	870	41·99 per cent dry matter
Kentucky Blue, 20; White clover, 2; Timothy, 5	2	1,160	1	146	41·60 per cent dry matter
Red Top, 20; White clover, 2; Timothy, 5	2	1,080	1	9	39·55 per cent dry matter
Red Top, 10; Kentucky Blue, 10; White clover, 2; Timothy, 5	1	1,800	0	1,618	42·58 per cent dry matter

EXPERIMENTS WITH FERTILIZERS

GYPSUM AND SULPHUR, 1924

This experiment was begun in 1924, and was reported upon page 51 of the 1928 report of this Station. This test has for its object the ascertaining of the effect of gypsum and sulphur on crop yields, and of gypsum, sulphur and superphosphate on the suppression of potato scab. Sulphur has been advised for use on soils infested with scab, and as this land had been limed twice at the rate of

two tons per acre when seeding down in two three-year rotations, and as the potatoes grown on this area in 1923 were infested with scab, it was thought suitable for the experiment. There are approximately 100 pounds of sulphur in 550 pounds of gypsum and the same amount in 890 pounds of superphosphate. Sulphur was applied to plots 5, 6, and 7 at the rate of 100, 200, and 400 pounds per acre, respectively. Gypsum was applied to plots 1, 2, and 3 to furnish 100, 200, and 400 pounds of sulphur per acre, while the superphosphate applied to plots 8 and 9 furnished approximately 100 and 200 pounds of sulphur per acre, respectively. No plant food was supplied except to plots 8, 9, and 11. Plots 8 and 9 received 150 and 300 pounds of phosphoric acid per acre, respectively, in the form of superphosphate. Plot 11 received 150 pounds of phosphoric acid per acre as ground rock phosphate. Plots 15 and 16 each received manure at the rate of 10 tons per acre. All plots were replicated four times.

Timothy following clover. This is a fine stand for seed.

In 1929 the land was again treated as in 1924 and in addition 1,000 pounds per acre of 5-8-5 fertilizer was applied over the whole area, including the check plots. Untreated Irish Cobbler potatoes showing a large percentage of scab were planted.

The average yields per acre of the different crops from 1924 to 1930, inclusive, are given in the following table, together with the total value of the crops during this period. In calculating this total value potatoes have been valued at 60 cents and oats at 70 cents per bushel, straw at $6 and hay at $10 per ton.

GYPSUM AND SULPHUR EXPERIMENT, 1924; YIELDS PER ACRE AND TOTAL VALUE OF CROPS, 1924–1930, INCLUSIVE

Plot	How treated, 1924, pounds per acre	Potatoes, 1924		Oats, 1925		Clover hay, 1926	Total timothy hay, 1927 and 1928	Potatoes, 1929		Oats, 1930		Total value of product, 1924–1930 inclusive
		Average per cent of scab	Average yield per acre	Grain	Straw			Average per cent of scab	Average yield per acre	Grain	Straw	
		%	bush.	bush.	tons	tons	tons	%	bush	bush.	tons	$
1	Gypsum, 550	6·2	153·8	50·0	1·38	2·73	2·88	55·1	136·7	30·6	0·92	300 62
2	Gypsum, 1100	6·7	144·6	50·3	1·39	2·69	2·62	54·7	141·3	31·8	0·74	294 89
3	Gypsum, 2200	9·2	179·9	54·1	1·45	2·69	3·04	61·1	122·0	35·3	0·92	315 24
4	Check, not treated	7·0	130·6	50·3	1·21	2·23	2·19	49·6	119·3	34·1	0·82	265 41
5	Sulphur, 100	16·7	159·8	50·1	1·44	2·87	2·83	57·8	128·0	37·6	0·88	304·99
6	Sulphur, 200	9·7	171·9	56·0	1·45	2·73	2·88	36·7	148·6	39·4	0·89	329 21
7	Sulphur, 400	10·5	164·5	48·9	1·44	2·42	3·15	45·7	149·4	35·3	0·72	315 94
8	Superphosphate, 890	3·2	171·9	50·3	1·55	2·63	2·67	51·6	138·0	31·8	0·78	310 39
9	Superphosphate, 1780	12·2	169·2	58·8	1·66	3·20	3·15	62·0	142·7	38·8	0·94	334 56
10	Check, not treated	3·7	144·5	54·8	1·48	3·06	3·20	70·5	126·7	30·6	0·86	299·13
11	Ground natural rock phosphate, 500	7·5	183·2	60·2	1·63	3·02	3·68	59·6	142·0	41·4	0·94	348 66
12	Ground limestone, 4000	9·5	152·6	59·3	1·63	3·25	3·56	74·4	126·0	42·3	0·92	322 60
13	Sulphur, 200; ground limestone, 4000	6·7	147·2	48·9	1·01	2·69	2·59	75·8	110·7	34·1	0·90	277 11
14	Check, not treated	12·7	163·9	53·1	1·52	2·94	2·92	65·3	121·4	29·4	0·70	300 85
15	Gypsum, 500; manure (10 tons)	9·5	198·5	55·3	1·69	3·06	2·87	65·7	171·3	41·2	1·02	364 99
16	Manure (10 tons)	6·5	176·4	54·1	1·65	3·05	3·08	76·3	147·3	40·0	0·94	337 47
17	Check, not treated	3·2	149·2	49·8	1·45	2·88	2·55	60·3	132·3	32·9	0·82	294 71
	Average of all check plots	6·6	147·0	52·0	1·41	2·78	2·71	61·4	124·9	31·7	0·80	290 02

CALCITIC VS. MAGNESIAN LIMESTONE, 1924

This experiment was undertaken to ascertain whether applications of magnesian limestone are as effective in crop production as calcitic limestone, and to learn if continued applications of ground magnesian limestone had a depressing effect on subsequent crop yields. These materials were also compared with gypsum, and hydrated lime. The test was to have covered a four-year rotation of turnips, grain, clover hay, and timothy hay, but at the end of the four-year period it was decided to extend it one year, taking off another crop of timothy hay. The land was manured at the start in 1924 with 16 tons of stable manure per acre, which was ploughed under and the land disked. The limestone and gypsum were then applied and worked into the plots. Nitrate of soda at the rate of 150 pounds, and superphosphate at the rate of 300 pounds per acre were then applied to all the plots, including the check plots, and lightly harrowed in.

Turnips were seeded in 1924, and in 1925 grain, with clover and timothy. In 1926 two cuttings of clover were made. The hay crops in 1927 and 1928 were practically all timothy. The yields during the first rotation, 1924 to 1928, inclusive, are given on page 51 of the 1928 report of this Station.

The area was ploughed in the fall of 1928, and seeded to Longfellow corn in 1929, after receiving an application of 1,200 pounds per acre of a 5-8-5 fertilizer. No limestone was applied. In 1930 Victory oats were seeded over the whole area, no fertilizers being applied. These were seeded May 10 and harvested August 6.

The average yields per acre of the different crops from 1924 to 1930 are given in the table below, together with the total value of the crops during this period. In calculating the total value of the product turnips are valued at 5 cents and oats at 70 cents per bushel, corn at $4, straw at $6 and hay at $10 per ton. The yields as given are calculated from the average of four plots located at different places in the field.

In 1916 the whole area on which this test was made received 2 tons of ground limestone and 1,000 pounds of Sydney slag per acre. The subsequent treatment and crops were the same until 1924, with no intervening applications of limestone or slag. It will be noticed that the yields from the plots not limed in 1924 compare favourably with those from the limed plots; this would indicate an influence from the 1916 application of lime and slag.

CALCITIC VS. MAGNESIAN LIMESTONE, 1924; YIELDS AND TOTAL VALUE OF CROPS, 1924–1930, INCLUSIVE

Plot	How treated, 1924, tons per acre	Average yield per acre								Total value of crops, 1924–1930 inclusive
		Turnips 1924	Oats, 1925		Clover hay, 1926, two cuttings	Total timothy hay, 1927 and 1928	Corn, 1929	Oats, 1930		
			Grain	Straw				Grain	Straw	
		bush.	bush.	tons	tons	tons	tons	bush.	tons	$
1	Magnesian limestone, 2	500·4	58·8	1·90	3·33	3·71	11·84	28·2	0·72	219 40
2	Magnesian limestone, 4	554·8	64·9	1·88	3·37	4·16	12·28	27·1	0·82	232 76
3	Magnesian limestone, 6	567·6	63·0	2·09	3·59	4·24	12·56	32·9	0·92	242 11
4	Magnesian limestone, 8	528·0	62·1	1·94	3·33	4·08	12·64	29·4	0·78	231 50
5	Check, not treated	551·6	52·7	1·64	3·54	3·88	12·56	28·2	0·72	222 81
6	Calcitic limestone, 2	602·9	61·4	1·90	3·18	3·69	11·56	28·2	0·84	225 08
7	Calcitic limestone, 4	582·4	59·2	1·75	3·40	3·57	12·56	34·1	0·82	229 78
8	Calcitic limestone, 6	568·6	61·6	1·86	3·30	3·77	12·04	36·4	0·98	232 93
9	Calcitic limestone, 8	595·2	66·8	2·04	3·22	3·92	12·52	30·6	0·80	235 56
10	Check, not treated	570·8	64·3	1·82	3·61	3·53	13·56	34·1	0·86	239 14
11	Gypsum, 2	567·6	57·6	1·72	2·82	3·31	11·52	31·8	0·74	213 10
12	Gypsum, 4	572·8	58·3	1·63	2·47	2·88	11·60	32·9	0·80	206 96
13	Check, not treated	532·4	61·2	1·72	2·78	3·08	12·08	30·6	0·64	211 96
14	Hydrated lime, 1	529·2	63·0	1·74	2·76	3·48	12·16	31·8	0·78	218 98
15	Hydrated lime, 2	542·0	67·5	2·22	3·47	4·08	12·92	30·6	0·82	241 31
16	Hydrated lime, 3	532·5	64·9	2·20	3·70	4·28	13·12	32·9	0·82	245 60
17	Hydrated lime, 4	503·6	62·1	2·20	3·35	3·88	12·08	31·8	0·94	230 37
18	Check, not treated	497·2	61·4	1·78	3·03	3·36	12·76	30·6	0·76	219 44

Average value of crops where magnesian limestone was used	$ 231 44
Average value of crops where calcitic limestone was used	230 84
Average value of crops where hydrated lime was used	234 06
Average value of crops where gypsum was used	210 03
Average value of crops where no lime was used	223 34

MANURE VS. COMMERCIAL FERTILIZER

This experiment was begun in 1925, to obtain information as to the relative values of manure and commercial fertilizer in a four-year rotation of corn, oats, clover and timothy. Both the manure and the fertilizer were applied previous to planting the corn, the manure at the rate of 16 tons per acre and the fertilizer to furnish approximately the same amount of plant food as was supplied by the manure. Manure is estimated to contain 8 pounds of nitrogen, 6 pounds of phosphoric acid, and 8 pounds of potash per ton; sixteen tons would therefore supply 128 pounds of nitrogen, 96 pounds of phosphoric acid and 128 pounds of potash. To furnish these different amounts of plant food by means of commercial fertilizers would require 853 pounds of 15 per cent nitrate of soda, 600 pounds of 16 per cent superphosphate, and 256 pounds of 50 per cent muriate of potash. These quantities were mixed and applied to various crops, and compared with applications of 16 tons of manure. At the commencement of the experiment the manure and the fertilizer cost practically the same, valuing manure at $2.16 per ton.

The annual and average yields will be found in the following table.

Placing the value of corn and sunflowers at $4 per ton, oats at 70 cents per bushel, and hay at $12 per ton, the total value of the crops from a four-acre field under this rotation is as follows: treated with 16 tons of manure per acre, applied previous to the hoed crop, $155.93; treated with commercial fertilizer as mentioned above, $164.77. This shows a small difference of $8.84 in favour of the fertilizer treatment.

MANURE VS. COMMERCIAL FERTILIZER—AVERAGE YIELDS PER ACRE

Crop	Manure (16 tons per acre)						Commercial fertilizer (Nitrate of soda, 853 pounds; superphosphate, 600 pounds; muriate of potash, 256 pounds per acre)						Average yields, 1925 to 1930	
	1925	1926	1927	1928	1929	1930	1925	1926	1927	1928	1929	1930	Manure	Commercial fertilizer
Corn.....tons	17·32	14·24	.....	.....	8·94	11·36	16·39	14·82	.....	.....	11·06	14·60	12·96	14·22
Oats.....bush.	.....	23·50	27·00	30·60	18·80	15·05	.....	28·20	24·00	27·30	18·80	21·40	22·99	23·90
Clover.....tons.	.....	.....	1·42	1·82	1·41	0·96	.....	.....	1·47	1·60	1·40	0·94	1·40	1·35
Timothy.....tons	.....	.....	.....	2·30	1·72	1·36	.....	.....	.....	2·08	1·50	1·42	1·76	1·66
Sunflowers.....tons	.....	.....	13·96	11·08	.....	.....	.....	.....	14·48	13·04	.....	.....	12·52	13·76

NITROGENOUS FERTILIZERS ON GRAIN (1927)

This experiment was begun in 1927 to secure information as to the relative value of different nitrogenous fertilizers. Those indicated in the table were used with different phosphatic fertilizers and with ground limestone. A blanket application of 100 pounds per acre of muriate of potash was applied to the whole area, including the check plots, in 1927. Oats were seeded in 1927, and a clover crop harvested in 1928. In the spring of 1929 two plots of the three replications of each treatment received a surface dressing of the nitrogenous fertilizer originally used in 1927, and at the same rate per acre. All of these applications gave an increased yield over those plots not surface dressed, the average increases being as follows: nitrate of soda, 0·77 of a ton; sulphate of ammonia, 0·46 of a ton; cyanamide, 0·06 of a ton; urea, 0·3 of a ton, and nitrate of lime, 0·3 of a ton. The increases were greatest on Range A, which had received a blanket application of Belgian slag in 1927. There was an increase on this range also in 1930, but, unexplainably, on the ranges that had received blanket applications of Sydney slag and ground limestone in 1927 the yields from the plots that had received the extra dressing in 1929 were less than those from the plots fertilized in 1927 only. Some gain in yield was secured from the surface-dressed plots on the range which received a blanket application of superphosphate in 1927, the larger gains coming from those plots treated with nitrate of lime and sulphate of ammonia. Considering the two years' crops the gains from the surface dressing have been noticeably greater on the range that received the blanket application of Belgian slag in 1927 than on the other three ranges.

NITROGENOUS FERTILIZERS ON GRAIN (1927)—AVERAGE YIELDS PER ACRE, 1927 TO 1930, INCLUSIVE

Plot	Pounds per acre of nitrogenous fertilizers applied in 1927 and 1929	RANGE A Blanket application Belgian Slag, 500 poupds per acre, 1927					RANGE B Blanket application Sydney Slag, 570 pounds pre acre, 1927				
		Oats, 1927		Clover, 1928	Timothy, 1929	Timothy, 1930	Oats, 1927		Clover, 1928	Timothy, 1929	Timothy, 1930
		Grain	Straw				Grain	Straw			
		bush.	tons	tons	tons	tons	bush.	tons	tons	tons	tons
1	Nitrate of soda, 150 (1927)	18·8	0·64	1·63	1·28	0·96	22·6	0·60	1·48	2·08	0·88
1a, 1b	Nitrate of soda, 150 (1929)				2·48	1·56				2·00	1·24
2	Sulphate of ammonia, 110 (1927)	18·8	0·77	1·68	1·60	1·44	21·6	0·62	1·28	1·92	0·96
2a, 2b	Sulphate of ammonia, 110 (1929)				2·64	1·52				1·44	0·76
3	Cyanamide, 110 (1927)	25·4	0·66	1·84	1·92	1·44	19·6	0·66	1·23	1·76	1·04
3a, 3b	Cyanamide, 110 (1929)				2·64	1·80				1·28	0·76
4	Urea, 50 (1927)	21·2	0·65	1·40	1·60	1·20	21·2	0·63	1·84	1·92	1·52
4a, 4b	Urea, 50 (1929)				2·24	1·32				1·44	0·84
5	Nitrate of line, 150 (1927)	21·6	0·70	1·84	2·24	1·60	16·9	0·40	1·55	1·76	1·20
5a, 5b	Nitrate of lime, 150 (1929)				2·72	1·32				1·36	0·68
	Checks, average of three in each range	14·8	0·46	2·19	2·24	1·20	11·8	0·44	1·80	0·91	0·72

NITROGENEOUS FERTILIZERS ON GRAIN (1927)—AVERAGE YIELDS PER ACRE, 1927 TO 1930, INCLUSIVE (*Continued*).

Plot	Pounds per acre of nitrogenous fertilizers applied in 1927 and 1929	RANGE C Blanket application superphosphate, 500 pounds per acre, 1927					RANGE D Blanket application ground limestone, 2 tons per acre, 1927				
		Oats, 1927		Clover, 1928	Timothy, 1929	Timothy, 1930	Oats, 1927		Clover, 1928	Timothy, 1929	Timothy, 1930
		Grain	Straw				Grain	Straw			
		bush.	tons	tons	tons	tons	bush.	tons	tons	tons	tons
1	Nitrate of soda, 150 (1927)	14·1	0·65	1·48	1·28	0·88	20·7	0·60	2·51	1·48	1·20
1a, 1b	Nitrate of soda, 150 (1929)	.....	.....	.....	2·16	0·84	.....	.....	.....	2·56	1·12
2	Sulphate of ammonia, 110 (1927)	19·6	0·59	1·68	1·44	0·96	20·8	0·60	2·24	1·92	1·28
2a, 2b	Sulphate of ammonia, 110 (1929)	.....	.....	.....	2·40	1·16	.....	.....	.....	2·24	1·00
3	Cyanamide, 110 (1927)	21·2	0·79	1·71	2·08	1·44	22·6	0·60	1·96	1·12	0·80
3a, 3b	Cyanamide, 110 (1929)	.....	.....	.....	2·16	1·20	.....	.....	.....	1·04	0·64
4	Urea, 50 (1927)	19·6	0·67	1·47	1·28	0·88	22·7	0·65	2·43	1·60	1·28
4a, 4b	Urea, 50 (1929)	.....	.....	.....	1·84	0·96	.....	.....	.....	2·08	0·84
5	Nitrate of lime, 150 (1927)	18·1	0·57	1·96	1·28	0·64	19·6	0·59	2·13	1·60	1·04
5a, 5b	Nitrate of lime, 150 (1929)	.....	.....	.....	2·24	1·04	.....	.....	.....	1·76	0·88
	Checks, average yield of three in each range.	9·4	0·32	1·63	1·00	0·64	9·4	0·43	2·32	1·48	0·80

NITROPHOSKA, 1929

Nitrophoska is a concentrated fertilizer containing 15 per cent of nitrogen, 30 per cent of phosphoric acid, and 15 per cent of potash. This experiment was outlined to compare this material with other complete fertilizers furnishing the same amounts of plant food but deriving their nitrogen from various sources, their phosphoric acid from superphosphate, and their potash from muriate of potash. On one series of plots nitrogen was not applied. The average yields of potatoes in 1929 and of Victory oats in 1930 are given in the table below. The oats were seeded May 10 and harvested August 12. The land had been ploughed in the fall of 1929 and well worked before seeding the oats. No fertilizer was applied in 1930. The plots from which these yields are calculated are one-eightieth of an acre, and are replicated four times.

NITROPHOSKA—RESULTS IN 1929

Plot	How fertilized, 1929—Pounds per acre	Average yield per acre		
		Potatoes, 1929	Oats, 1930	
			Grain	Straw
		bush.	bush.	tons
1	Nitrophoska, 400	202·7	42·3	0·97
2	Nitrate of soda, 400; superphosphate, 750; muriate of potash, 120	216·0	40·0	0·87
3	Sulphate of ammonia, 300; superphosphate, 750; muriate of potash 120	218·7	41·1	1·10
4	Check, not fertilized	145·3	31·1	0·74
5	Calcium nitrate, 400; superphosphate 750; muriate of potash, 120	229·3	38·8	0·76
6	Cyanamide, 285; superphosphate, 750; muriate of potash, 120	176·0	41·1	0·85
7	Check, not fertilized	142·7	32·3	0·75
8	Urea, 130·5; superphosphate, 750; muriate of potash, 120	205·3	34·7	0·68
9	Nitro-chalk, 400; superphosphate, 750; muriate of potash, 120	217·3	34·7	0·66
10	Superphosphate, 750; muriate of potash, 120	169·3	31·1	0·64

PHOSPHATIC FERTILIZERS FOR OATS, 1929

This experiment was begun in 1929 to compare different phosphatic fertilizers for the production of oats, and to secure data as to their relative value in the succeeding clover crop. Slag, 16 per cent; superphosphate, 16 per cent; and treble superphosphate, 45 per cent, were used singly, each to furnish 75 pounds of phosphoric acid per acre. These were also combined with nitrate of soda and muriate of potash, which were used to furnish 37·5 pounds of nitrogen and 37·5 pounds of potash per acre, respectively. Nitrophoska, a concentrated fertilizer containing 15 per cent of nitrogen, 30 per cent of phosphoric acid, and 15 per cent of potash, was also used at a rate per acre to supply the same amounts of plant food as were furnished by the other complete fertilizers used. In another series of plots these same fertilizers and combinations of fertilizers were applied to furnish half the above amounts of plant food in each case. Ground limestone was added to superphosphate in a series of plots in order to secure a closer comparison between superphosphate and basic slag. Plot 17 was fertilized with 469 pounds of superphosphate and 235 pounds of ground limestone. Plot 18 was fertilized with 234·5 pounds of superphosphate and 235 pounds of ground limestone. The 235 pounds of ground limestone on plot 18 would furnish approximately the same amount of calcium oxide as would be furnished by the 234·5 pounds of basic slag in plot 11. There was no increase of yield of either grain or clover as a result of the addition of the limestone to the superphosphate.

The land used for this test had been in a flax fertilizing experiment in 1926, clover and timothy being seeded with that crop, and no fertilizer had been applied since 1926. This land was ploughed in the fall of 1928, well worked

up in the spring of 1929, staked off into plots of $\frac{1}{320}$-acre each, and the fertilizers applied by hand to each plot and well worked into the soil. All plots were replicated four times. Alaska oats were grown in 1929, followed by clover in 1930. The plots fertilized alike were well separated in the area. The results from both the grain and the clover crops are recorded in the following table, and would indicate that phosphorus is essential for the production of oats; that on this land in the dry season of 1929 superphosphate, 16 per cent, gave larger yields of oats than either slag or treble superphosphate, but that in the clover crop of 1930 the plots receiving slag in 1929 gave higher yields than those receiving either 16 per cent of treble superphosphate. The addition of nitrogen and potash did not increase the yield of either grain or clover in this particular test. The heavier applications were more profitable than the lighter applications. Both 1929 and 1930 were dry seasons and the yields recorded are light, but they nevertheless offer a fairly accurate comparison within each year.

PHOSPHATIC FERTILIZERS FOR OATS, 1929

Plot	How fertilized, 1929—Pounds per acre	Average yield per acre		
		Oats, 1929		Clover, 1930 (green weight)
		Grain	Straw	
		bush.	tons	tons
1	Nitrophoska, 250	30·1	0·78	1·68
2	Slag, 16 p.c., 469	30·1	0·75	2·12
3	Superphosphate, 16 p.c., 469	34·8	0·81	1·84
4	Treble superphosphate, 45 p.c., 166·6	28·2	0·75	1·60
5	Check, not fertilized	18·8	0·54	0·60
6	Nitrate of soda, 250; slag, 16 p.c., 469; muriate of potash, 75	31·1	0·80	1·68
7	Nitrate of soda, 250; superphosphate, 469; muriate of potash, 75	33·9	0·85	1·96
8	Nitrate of soda, 250; treble superphosphate, 45 p.c., 166·6; muriate of potash, 75	25·4	0·74	1·84
9	Nitrophoska, 125	20·7	0·67	0·72
10	Check, not fertilized	20·7	0·61	0·76
11	Slag, 16 p.c., 234·5	24·5	0·64	1·92
12	Superphosphate, 16 p.c., 234·5	28·2	0·66	1·64
13	Treble superphosphate, 83·3	24·5	0·64	1·52
14	Nitrate of soda, 125; slag, 234·5; muriate of potash, 37·5	24·5	0·61	1·28
15	Nitrate of soda, 125; superphosphate, 234·5; muriate of potash, 37·5	25·4	0·62	1·16
16	Nitrate of soda, 125; treble superphosphate, 83·3; muriate of potash, 37·5	23·5	0·64	1·12
17	Superphosphate, 469; ground limestone, 235	33·9	0·80	1·16
18	Superphosphate, 234·5; ground limestone, 235	20·7	0·54	0·84

DOUBLE-STRENGTH FERTILIZER

An 8-16-20 fertilizer applied at the rate of 600 pounds per acre, was compared with a home-mixed 4-8-10 fertilizer (sulphate of ammonia being used as the nitrogenous material), applied at a rate to give the same amounts of plant food as the other fertilizer. The land on which the test was conducted is a fairly heavy sandy loam. The previous crop was grain. Manure was applied in the spring of 1930 at the rate of 12 tons per acre, and the land ploughed, disked and cultivated. Rows were run with the potato planter, the fertilizers applied in the rows by hand, the weeder run lightly over the rows to mix soil with the fertilizer, and Green Mountain potatoes planted with the potato planter May 29. These were cultivated as required through the season, sprayed four times, and the crop harvested October 21. The stand of plants was uniform on both plots, and there were very few small potatoes and no rot. The yields, calculated from $\frac{1}{4}$-acre plots, were at the rate of 228 bushels per acre from the plot treated with the home-mixed fertilizer, and 230 bushels per acre from the 8-16-20 plot.

POSITION OF FERTILIZER

This experiment was planned to determine the effect of the position of the fertilizer (relative to the roots of the plant) on the crop yield. It was begun this year, with potatoes. The fertilizer was applied in four different ways: broadcast; below the seed in the row and covered with one inch of soil; along the row at the side of the seed, and in contact with the seed. A home-mixed 4-8-10 fertilizer was used, and applied at two rates, 750 and 1,500 pounds per acre.

The land was ploughed, well worked with disk and cultivator, and the fertilizer applied broadcast to certain plots and well worked in. Rows were then run with the potato planter, with the disks removed. The fertilizer for the other treatments was then applied by hand to each plot in the manner called for, and the potatoes (Green Mountain) planted, June 4. The crop was dug October 21. No scab was present.

The yields as given in the table are calculated from the total crop, as all were marketable.

EFFECT OF POSITION OF FERTILIZER ON YIELD—RESULTS, 1930

Plot	Position of fertilizer	Average yield of marketable potatoes per acre
		bush.
	1,500 pounds per acre	
1	Broadcast	174·1
2	Below seed in row and covered with 1 inch of soil	205·3
3	Along row at side of seed	230·6
4	In contact with seed	162·6
	750 pounds per acre	
1	Broadcast	164·5
2	Below seed in row and covered with 1 inch of soil	178·8
3	Along row at side of seed	225·3
4	In contact with seed	208·0

POULTRY

BREEDING STOCK

The breeding pens for 1930 had twenty-one S.C.W. Leghorn hens with an average production of 216 eggs, and sixty-two B.P. Rocks with an average production of 217 eggs. The average production of the breeding stock shows an increase of 12 eggs per hen over that of 1929.

Below is shown the average second-year production of the hens carried to the end of their second year, as compared with their pullet year production.

Number of hens	Breed	First year production	Second year production
7	S.C.W. Leghorn	219	169
17	B. P. Rock	235	157

The hatching results for 1930 were as follows:—

Eggs set	Per cent fertile	Number of chicks	Per cent of total eggs to hatch	Per cent of fertile eggs to hatch	Number of chicks alive at three weeks	Per cent mortality to three weeks
2,529	93·2	1,279	50·57	54·26	1,167	8·8

The chicks were raised to ten weeks of age in two shed-roof laying houses, each 16 feet by 32 feet, heated by two coal-burning brooder stoves. They were then put into the colony houses on range. Early in October 353 pullets were put in laying quarters, and feeding tests commenced November 1. Sixty cockerels from hens laying over 200 eggs were distributed to the Illustration Stations or sold as breeders.

FEEDING EXPERIMENTS

FISH MEAL VS. BEEF MEAL

The purpose of this experiment is to determine the best amounts of these feeds to add to the laying mash, and also to determine if they are better fed separately or in combination. Eight pens of 20 B.P. Rock pullets each were used in the test which extended from November 1, 1929, to May 1, 1930, a period of six months. A common dry mash was used in all the pens and to this was added the beef meal and fish meal as required for the individual pens. The pens were given a wet mash daily, being the common dry meal moistened with a small amount of buttermilk and cod liver oil.

It is expected to gain some information as to the effect of these different feeds on egg size. The eggs were weighed twice a week and divided into three groups, according to weight, as shown in the following table. The table also gives for each pen the cost of the different feeds consumed, the value of the eggs laid, and the profit over the cost of the feed. The average of two years' results with this experiment are also given.

FISH MEAL VS. BEEF MEAL: COSTS, PROFITS, ETC.

—	Beef meal, 20 per cent	Beef meal, 15 per cent	Beef meal, 10 per cent; fish meal, 5 per cent	Beef meal, 5 per cent; fish meal, 5 per cent	Beef meal, 5 per cent; fish meal 5 per cent; cod liver meal, 2 per cent	Beef meal, 5 per cent; fish meal, 10 per cent	Fish meal, 15 per cent	Fish meal, 20 per cent
	$	$	$	$	$	$	$	$
Scratch grain	15 96	15 71	16 13	15 07	15 71	16 10	15 26	16 03
Dry mash	9 85	10 81	10 82	10 94	9 26	9 58	9 62	8 60
Buttermilk	0 60	0 60	0 60	0 60	0 60	0 60	0 60	0 60
Green feed	0 87	0 87	0 87	0 87	0 87	0 87	0 87	0 87
Grit	0 14	0 10	0 14	0 11	0 14	0 15	0 14	0 16
Shell	0 36	0 36	0 38	0 34	0 35	0 34	0 30	0 32
Cod liver oil	0 75	0 75	0 75	0 75	0 75	0 75	0 75	0 75
Wet mash	3 21	3 21	3 21	3 21	3 21	3 21	3 21	3 21
Cost of feed	31 74	32 41	32 90	31 89	30 89	31 60	30 75	30 54
Value of eggs	52 90	57 70	58 84	63 39	68 99	62 79	63 99	55 52
Profit over cost of feed	21 16	25 29	25 94	31 50	38 10	31 19	33 24	24 98
Average profit, two years	20 33	23 74	21 18	23 67	28 44	32 67	30 84	25 43
Deaths					2	1	1	2
Number of eggs below 20 ounces to the dozen	42	14	6	34	28		41	87
Number of eggs from 20 ounces to to 24 ounces per dozen	1,285	635	1,035	1,075	889	650	1,175	1,254
Number of eggs 24 ounces per dozen or over	303	1,038	726	785	1,187	1,152	655	396

These results are interesting in that they show a high-grade fish meal to have been a better source of animal protein than beef meal. It would appear that it is not desirable to feed pullets a mash with more than 15 per cent of animal protein, as there seems to be a relationship between egg size and the percentage of animal protein fed. The two pens receiving 20 per cent of animal protein had the smallest number of eggs grading 24 ounces or over to the dozen, and these pens also show the smallest profit over cost of feed for the period.

FISH MEAL VS. BEEF MEAL: HATCHING RESULTS

B.P. Rock hens were used in the breeding pens to determine the value of feeding different percentages of beef meal and fish meal in promoting egg fertility and hatchability. These pens were put on the experimental rations January 1 and fed two months prior to collecting the eggs for hatching.

The results for 1930 are given in the table, and also the average results for the two years 1929 and 1930.

FISH MEAL VS. BEEF MEAL—RESULTS IN 1930 AND AVERAGE

Animal meal fed in mash		Eggs set	Eggs fertile	Eggs hatched	Per cent eggs fertile	Per cent fertile eggs hatched	Per cent total eggs hatched
Beef meal, 20 per cent.....	(a)	208	204	112	98·1	54·9	53·8
	(b)	355	344	195	96·9	56·7	54·9
Beef meal, 15 per cent.....	(a)	327	324	203	99·1	62·7	62·1
	(b)	401	395	243	98·5	61·5	60·6
Beef meal, 10 per cent.....	(a)	161	151	60	93·8	39·7	37·3
Fish meal, 5 per cent.....	(b)	248	236	106	95·2	44·9	42·7
Beef meal, 5 per cent.....	(a)	255	240	89	94·1	37·1	34·9
Fish meal, 5 per cent.....	(b)	375	354	147	94·4	41·5	39·2
Beef meal, 5 per cent.....	(a)	236	215	139	91·1	64·7	58·9
Fish meal, 5 per cent.....							
Cod liver meal, 2 per cent..	(b)	335	306	194	91·3	63·4	57·9
Beef meal, 5 per cent.....	(a)	204	191	127	93·6	66·5	62·3
Fish meal, 10 per cent.....	(b)	339	319	209	94·1	65·5	61·7
Fish meal, 15 per cent.....	(a)	214	178	91	83·2	51·1	42·5
	(b)	354	309	183	87·3	59·2	51·7
Fish meal, 20 per cent.....	(a)	188	183	135	97·3	73·8	71·8
	(b)	280	274	193	97·9	70·4	68·9

(a) Results for 1930.
(b) Average results for 1929 and 1930.

These results indicate the advisability of feeding the breeding stock a mash that has a high percentage of animal protein, preferably fish meal. The pen receiving only 10 per cent of animal protein in the mash has given the poorest results for the two years.

NEW PROJECTS

A number of new projects were started this year and tables relating to these are given below.

PROJECT P. 3—BEST DATE FOR INCUBATION

Date of hatch	Eggs set	Per cent fertile	Eggs fertile	Per cent hatched	Number hatched	Number of deaths to 3 weeks	Per cent mortality to 3 weeks
1930							
April 2	503	91·4	43	50·9	256	11	4·3
April 16	457	96·1	18	53·0	242	32	13·2
April 30	590	94·7	31	52·7	311	33	10·6
May 9	439	90·4	42	52·6	231	15	6·5
May 22	540	93·0	38	44·3	239	21	8·8

PROJECT P. 7—HATCHABILITY FROM LARGE AND MEDIUM-SIZED EGGS

Weight per dozen	Eggs set	Number fertile	Number hatched	Per cent hatched
25 ounces	218	10	140	64·2
26 ounces	455	24	242	53·2
27 ounces	348	6	180	51·7
Over 27 ounces	110	14	48	43·6

Records from B. Rock hens.

PROJECT P. 12—HATCHING RESULTS BY BREEDS

Breed	Eggs set	Per cent fertility	Eggs fertile	Number hatched	Per cent hatched	Number of deaths to 3 weeks	Per cent mortality to 3 weeks
B.P. Rocks	1,793	94·0	107	955	53·3	82	8·6
S.C.W. Leghorns	736	91·2	65	324	44·0	30	9·3

In the projects below the records are all from B.P. Rock hens.

PROJECT P. 111—BREEDING FOR HATCHABILITY AND VIABILITY—EXPERIMENT B., GOOD VS. POOR LAYERS

Record of layers	Eggs set	Number infertile	Number hatched	Per cent hatched	Number of deaths to 3 weeks	Per cent mortality to 3 weeks
Below 200 eggs	420	10	219	52·1	26	11·9
Over 200 eggs	711	44	391	55·0	36	9·2

PROJECT P. 113—RELATION OF WINTER PRODUCTION TO FERTILITY, HATCHABILITY AND VIABILITY

Records of hens to March 1	Eggs set	Number infertile	Number hatched	Per cent hatched	Number of deaths to 3 weeks	Per cent mortality to 3 weeks
30 or over	278	19	137	49·3	14	10·2
15 to 30	493	27	295	59·8	33	11·2
Under 15	360	8	178	49·4	15	8·4

PROJECT P. 114—INHERITANCE OF EGG SIZE CHARACTERISTICS

Below is a summary of the progeny of five Barred Rock males.

Male number	Second year egg weights per dozen of sire's dam's eggs	Number of pullets	Average size of eggs of pullets	Number of pullets laying eggs below 23 ounces to the dozen
	oz.		oz.	
106	24	40	23·0	17
115	24	32	23·0	8
109	28	47	23·8	9
105	29	21	24·8	1
107	29	20	25·3	.....

PROJECT P. 163—RELATION BETWEEN ANNUAL PRODUCTION AND DATE OF FIRST EGG, AND PROJECT P. 204; RELATION BETWEEN DATE OF FIRST EGG AND SIZE OF EGG

Number of birds	Number of days to first egg	Average egg size oz. per doz.	Average production	Average body weight
				lb.
16	185 or less	24·2	210	6·7
9	185 – 200	24·5	203	6·7
13	200 – 215	24·4	202	6·7
19	Over 215	25·5	195	6·8

PROJECT P. 203—RELATION BETWEEN BODY WEIGHT AND SIZE OF EGG

Number of birds	Average weight	Egg size	Average production
	lb.	oz. per doz.	
27	Under 6	24·5	180
27	6 to 7	24·0	204
22	Over 7	25·0	188

N.S. SOUTHERN EGG LAYING CONTEST

The sixth egg-laying contest to be held at this Station commenced November 1, 1929, and closed October 23, 1930. This year's records are superior to those of any previous contest conducted at Kentville.

1. The average production per bird is higher, reaching 180.
2. The number of birds to qualify for registration is higher, reaching 48.
3. This is the first year in which the total points have exceeded the total eggs, and denote that an improvement is being obtained in egg size.
4. Barred Rock No. F 94, belonging to Rev. J. B. Daggett, Kingston, N.S., is the first bird to lay 300 eggs. B. Rock No. F101 and W. Leghorn No. F115, both belonging to the Experimental Station, Kentville, are the first birds to obtain records of over 300 points.
5. The pen of R.I. Reds belonging to Mrs. G. F. Reed, Middleton, N.S., was high pen with a total of 2,152·9 points, which is 0·2 point higher than the record obtained by Hillside O. Farm's pen in 1925-26.

The cost of feed for the year 1929-30 was as follows:—

Scratch grain, 9,105 pounds at $3.20 per cwt.	$	291 36
Dry mash, 9,347 pounds at $2.88 per cwt.		269 19
Green feed, 9,180 pounds at 25 cents per cwt.		22 95
Buttermilk, 3,700 pounds at 35 cents per cwt.		12 95
Grit, 234 pounds at $1.25 per cwt.		2 93
Oyster shell, 663 pounds at $1.25 per cwt.		8 29
Cod liver oil, 17 gallons at $1 per gal.		17 00
Meat scrap, 340 pounds at $5.75 per cwt.		19 55
Epsom salts, 30 pounds at $4 per cwt.		1 20
Total cost of feed	$	645 42
Total revenue (sale of eggs)	$	1,099 14
Total cost of feed		645 42
Total profit over cost of feed	$	453 72

APIARY

The autumn of 1929 was favourable for the preparation of bees for winter but not for brood-rearing, as very little goldenrod honey was gathered. Consequently a higher percentage of old bees were in the hives than normally when put away for winter.

The months of March, April, and May, 1930, were cold; consequently brood-rearing was retarded and the consumption of stores was heavy, making it necessary to feed the colonies. Owing to the dry weather in June and July very little surplus was gathered from Dutch and alsike clovers. Although the weather continued dry throughout the season a surplus of honey was gathered from the goldenrod especially from the white species *(Solidago bicolor)*, enabling the bees to carry on brood-rearing to a late date.

PACKAGE BEES AS A MEANS OF ESTABLISHING AN APIARY

Seven 3-pound packages of bees imported from Alabama arrived May 12. These were put in ten-frame hives on drawn combs, and fed sugar syrup.

These colonies were used in orchard pollination experiments, but for only two days, and were not poisoned. The average production of the seven packages was 46·8 pounds; practically all of this was gathered from goldenrod. The greatest production from any one of these packages was 62 pounds.

COMPARISON OF YIELD FROM COLONIES POISONED AND NOT POISONED

On May 27 thirty-seven colonies were distributed through the Station orchards and left there during the bloom period. Five colonies were moved two miles from the Station, out of the area where poisoned dust is used. Twelve colonies were left in the apiary. Practically all the colonies that were left at the Station were poisoned, while those removed were not poisoned.

The following table gives the strength of the colonies before and after poisoning, and the crop of honey gathered:—

STRENGTH OF COLONIES AND YIELD OF HONEY

Group	Number colonies in group	Average number combs covered before colonies were placed in orchard	Average number combs covered after bloom fell	Average amount honey produced
				lb.
Left at Kentville and poisoned	49	5·1	5	36·2
Removed and not poisoned	5	6·4	9·4	87·6

COLONIES IN KOOTENAY CASES

This is a comparison of two colonies in Kootenay cases with ten in quadruple cases. While the average production of honey from these two groups is practically the same the time required to handle colonies in Kootenay cases is much less than that required to handle those in quadruple cases. The former are packed the year around while the quadruple cases are only packed from October to May, thus requiring labour in packing and unpacking.

COMPARISON OF CASES

Group	Number in group	Average number combs covered in spring	Average amount honey produced
			lb.
Kootenay cases	2	7	37·5
Quadruple cases	10	5·8	36·4

COMPARISON OF DIFFERENT TYPES OF HIVES

The three types of hives in use at this Station are eleven-frame Modified Dadant, ten-frame Jumbo, and ten-frame Langstroth. The table below gives a comparison of the strength of the colonies in the spring and the yields per colony, the figures in each case being those from the three highest-yielding colonies in each type of hive.

COMPARISON OF HIVES

Type of hive	Number of colonies	Average number combs covered at first examination	Total crop honey	Average crop of honey
			lb.	lb.
Langstroth	3	6·0	249	83
Jumbo	3	6·6	201	67
Modified Dadant	3	3·3	100	33·3

EFFECTS OF POISONED DUSTS AND SPRAYS ON BEES

The following table gives the average number of combs of bees and combs of brood in eighty-five colonies, before they were placed in the orchards and after they were removed from the orchards. The two groups that were not poisoned were the eight colonies at Pereau and the five at North Alton.

POISONED DUSTS AND SPRAYS—RESULTS ON BEES IN 1930

Location of apiary	Number colonies in group	Number combs covered by bees before being placed in orchard	Number frames brood before being placed in orchard	Number combs covered by bees when removed from orchard	Number frames brood when removed from orchard	Number colonies dead from poisoning
Poisoned—						
Lakeville	7	7·2	5·0	5·4	3·1	0
Berwick	10	4·5	2·5	2·3	1·2	0
Billtown	7	7·0	3·1	2·8	1·7	0
Port Williams	20	5·2	2·8	0·5	0·3	9
Greenwich	4	5·8	3·0	4·0	2·4	0
Blomidon	8	6·4	4·0	4·2	2·7	0
Weston	10	6·0	3·2	2·7	1·5	0
Port Williams	2	6·0	3·7	2·0	1·0	0
Wolfville	4	6·1	3·2	2·4	1·2	0
Not Poisoned—						
North Alton	5	6·4	4·1	9·4	5·2	0
Pereau)	8	6·0	3·4	7·0	5·0	0

CELLAR WINTERING VS. WINTERING IN CASES

On November 21, 1929, one hundred and four colonies were placed in a cellar 20 feet by 12 feet constructed during the summer of 1929. Owing to the cold weather they were not removed until April 26. The average temperature of the cellar during this period was 43 degrees F. The consumption of stores by the colonies wintered in the cellar was greater than by those wintered outside. Before the bees were put away for winter any deficiency in the weight of the colonies was made up by feeding sugar syrup. Of the fifty-eight colonies wintered outside, fifty-six were in quadruple cases and two in Kootenay cases.

The following table gives the strength of the colonies before they were put away in the fall and their strength in the spring:—

STRENGTH OF COLONIES

Group	Average number combs covered in fall of 1929	Average number combs covered in spring of 1930	Number colonies that died during winter
Wintered in cellar	8·8	5·8	8
Wintered outside	8·5	5·2	2

WINTERING, 1930-31

One hundred and forty-five colonies were prepared for the winter of 1930-31. Of these fifty-six are wintering in quadruple cases, two in Kootenay cases, and eighty-seven in the bee cellar. All colonies were weighed on October 3 and immediately fed. On November 28 the bees were put in the cellar just after having a good flight.

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