DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
DOMINION EXPERIMENTAL FARMS

EXPERIMENTAL STATION

KAPUSKASING, ONT.

REPORT OF THE SUPERINTENDENT

SMITH BALLANTYNE

FOR THE YEAR 1928

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DOMINION EXPERIMENTAL STATION, KAPUSKASING, ONTARIO

REPORT OF THE SUPERINTENDENT, SMITH BALLANTYNE

THE SEASON

January, May, July, August, October, November, and December were all milder than usual, being 2·4, 2·3, 1·6, 3·5, 0·6, 3·0, and 11·8 degrees respectively above the average for an eleven-year period. February was 0·5, March 0·7, April 4·4, June 2·6, and September 2·2 degrees colder than the eleven-year average for these same months.

The total precipitation for the year was 32·46 inches, which is 7·66 inches above the eleven-year average of 24·80. This was the second highest precipitation received during the last eleven years, and has been surpassed only in 1921 when 37·68 inches were received.

During the five growing months, May 1 to September 30, 18·77 inches were received which equalled 57·8 per cent of the total for the year, while the average amount received during the same months over an eleven-year period was 13·44 inches or 54·2 per cent.

The ground was quite slow in drying up in the spring and no work could be done on the land until May 14, when disking was commenced. The first seeding was done on May 15, which was over a week later than in 1927. By June 7, the seeding was practically all completed, which is somewhat later than usual. Owing to the fact that 1·27 inches of rain occurred on June 7, 8 and 9, some of the grain was injured and did not give a full stand. Stooling also appeared to be particularly affected by the water-logged condition of the soil after seeding.

June received 2·98 inches of precipitation and July 3·59. This occurred on 14 different dates in June and 19 in July, which gave a very excellent growing period for most crops, particularly hay. Fortunately, a very good period of hay weather occurred from July 28 to August 15, during which only 0·94 inch of rain fell. From August 16 to the end of September, rain occurred on twenty-four different days and totalled 9·34 inches, which made it quite difficult to harvest and cure the grain crops, particularly the later varieties. Owing to a high mean temperature during July and August plus long hours of sunshine in the latter month, all of the cereal grains matured very well.

During the year 1,519·4 hours of sunshine were recorded, which is 216·9 hours less than the average for a ten-year period.

No damage was suffered from summer frost this season, but fall-ploughing was closed down by frost on November 1, which is unusually early.

METEOROLOGICAL RECORDS

Month	Temperature, Degrees Fah.						Precipitation (inches)				Sunshine (hours)	
	Mean		Maximum		Minimum				Total precipitation			
	1928	Average 11 years	Highest	Mean maximum	Lowest	Mean minimum	Rain 1928	Snow 1928	1928	Average 11 years	1928	Average 10 years
January	0·4	−2·0	33	12·7	−35	−11·9	.....	30·5	3·05	1·37	78·7	81·9
February	1·6	2·1	31	16·5	−36	−13·3	.....	5·5	0·55	0·78	91·3	102·8
March	12·7	13·4	42	24·2	−29	1·2	0·48	9·8	1·46	1·27	110·9	138·1
April	26·6	31·0	66	39·3	−11	14·0	0·47	17·5	2·22	1·91	182·2	175·2
May	47·7	45·4	75	59·6	25	35·8	2·08	.....	2·08	1·65	203·4	225·9
June	54·0	56·6	83	66·7	30	41·3	2·98	.....	2·98	2·11	174·4	239·5
July	63·0	61·4	85	74·4	39	51·6	3·59	.....	3·59	3·21	187·9	232·7
August	62·5	59·0	84	74·0	39	51·1	6·87	.....	6·87	3·09	230·2	205·2
September	48·5	50·7	76	58·7	27	38·3	3·25	.....	3·25	3·38	124·6	148·6
October	39·6	39·0	68	47·0	17	32·2	3·57	1·0	3·67	2·08	70·0	89·7
November	25·7	22·7	48	31·8	05	19·5	0·77	9·5	1·72	2·12	42·1	47·0
December	18·8	7·0	41	25·0	−17	12·5	0·34	6·8	1·02	1·83	23·7	49·7
Year	33·4	32·2	85	44·2	−36	22·7	24·40	80·6	32·46	24·80	1519·4	1736·3

ANIMAL HUSBANDRY

DAIRY CATTLE

The dairy herd totals fifty-two head, consisting of twenty-nine pure-bred Ayrshires and twenty-two grades. During the year three have qualified in the Canadian Record of Performance for pure-bred dairy cattle.

The herd is headed by Ottawa Supreme 12th —92925— a three year old bull which was transferred from the Experimental Station at La Ferme. This bull has been given class "A" standing in the Advanced Registry for pure-bred Ayrshire bulls. He is sired by Shewalton Mains Supreme (22659) —83930— an imported bull of extra good breeding. His dam is Dunlop Stellite (79155) —83932— an imported cow of show type and with good milk records behind her.

MILK RECORDS

The milk given by each cow is weighed morning and evening during her entire lactation period and recorded on a stable milk sheet. Each cow's milk is tested once per month to determine the percentage of fat which it contains. The feed consumed by each cow for the time during which she was dry previous to freshening as well as during her lactation period is also recorded. From these data are calculated the amount of feed required per year to maintain each animal, the feed cost of maintenance and the feed cost of milk production.

The accompanying table shows the amount of milk produced by each cow that completed a lactation period during the calendar year of 1928, the cost of feed and the value of the milk produced. The profit column is really a comparison between the cost of the feed consumed and the value of the milk produced, as both the labour and the value of the calf are not included.

In estimating the cost of feed the following values were used:—

Ensilage, sunflowers, per ton	$ 4 85
Ensilage, O.P.V. per ton	5 80
Roots, per ton	1 50
Hay, per ton	15 00
Meal, per 100 pounds	2 10
Pasture, per day	0 10

The hay and grain are valued at average local market prices, and the value of the silage is arrived at by assuming that 300 pounds of silage containing 25

Name of cow	Age at beginning of lactation period	Date of dropping calf	Number of days in lactation period	Total pounds of milk for period	Daily average yield of milk	Average per cent fat in milk	Pounds of butter produced in period	Value of butter at 45 cents per pound	Value of skim-milk at 50 cents per 100 pounds	Total value of product	Total cost of feed	Feed cost to produce 100 pounds milk	Feed cost to produce 1 pound butter, skim-milk neglected	Profit on cow, labour and calf neglected
	Years	Date	No.	lb.	lb.	%	lb.	$	$	$	$	$	$	$
Pure-bred Ayshires—														
Blossom of Glenborough	11	Oct. 5, 1927	325·5	9,066·3	27·85	3·74	403·43	181 54	43 64	225 18	138 64	1 529	0 344	86 54
Bessie 3rd	10	July 13, 1927	259·5	7,159·2	27·59	3·88	330·39	148 68	34 41	183 09	116 17	1 623	0 352	66 92
Ena of Glenborough	11	Nov. 21, 1927	270·5	6,780·8	25·07	3·87	312·58	140 66	32 59	173 25	114 06	1 682	0 365	59 19
*Kap. Kyle Ena	2	Apr. 14, 1927	319·0	6,336·7	19·86	4·63	349·27	157 17	30 22	187 39	105 59	1 666	0 302	81 80
*Lady Alice	8	Nov. 4, 1927	321·5	6,151·7	19·13	3·88	283·93	127 77	29 57	157 34	106 57	1 732	0 375	50 77
*Kap. Kyle Blossom	2	Aug. 18, 1927	317·5	5,902·4	18·59	4·25	298·62	134 38	28 26	162 64	120 74	2 046	0 404	41 90
Kap. Landlady	3	Oct. 7, 1927	316·0	5,003·9	15·84	4·11	244·99	110 25	23 99	134 24	107 33	2 144	0 438	26 91
Ottawa Supreme Trilby	2	Sept. 6, 1927	252·0	4,512·0	17·90	3·97	213·07	95 88	21 67	117 55	108 26	2 399	0 509	9 29
*Duchess of Geneva	10	Jul. 19, 1927	256·0	3,571·6	13·95	3·93	166·98	75 14	17 16	92 30	85 48	2 393	0 512	6 82
*Kap. Blossom	3	Jul. 13, 1927	231·0	2,706·3	11·72	4·12	132·75	59 74	12 97	72 71	63 28	2 338	0 477	9 43
*Dandy de St. Sulpice	4	Dec. 19, 1927	170·5	1,260·1	7·39	3·90	58·54	26 34	6 05	32 39	65 73	5 216	1 123	−33 34
Grade Ayshires—														
Maggie B 1	2	Dec. 27, 1926	377·0	10,515·2	27·89	3·81	477·46	214 86	50 57	265 43	165 60	1 574	0 347	99 83
Dewdrop C	3	Nov. 17, 1926	307·0	9,513·1	30·99	3·99	452·10	203 45	45 67	249 12	146 71	1 542	0 325	102 41
Phœbe C	2	Nov. 2, 1927	410·0	9,307·9	22·70	3·90	432·63	194 68	44 72	239 40	157 69	1 694	0 364	81 71
Bloomer A 1	5	Jul. 26, 1927	287·5	6,634·2	23·08	3·98	314·29	141 43	31 85	173 28	119 53	1 802	0 380	53 75
*Phœbe A 2	2	June 30, 1927	315·5	5,177·1	16·41	4·22	260·11	117 05	24 79	141 84	97 81	1 889	0 376	44 03
Phœbe B 2	2	Oct. 29, 1927	308·0	3,967·6	12·88	4·36	205·83	92 62	18 97	111 59	103 41	2 606	0 502	8 18
Pure-bred Shorthorns—														
*Kap. Browndale Grace	2	Sept. 16, 1927	319·5	3,486·9	10·91	4·24	175·86	79 14	16 70	95 84	80 68	2 314	0 459	15 16
Kap. Genevieve	2	Nov. 27, 1927	264·0	3,379·6	12·80	4·37	175·95	79 18	16 16	95 34	85 60	2 533	0 487	9 74
Kap. Prince Red Rose	2	May 22, 1928	193·0	3,029·6	15·70	4·49	162·02	72 91	14 47	87 38	63 00	2 079	0 389	24 38
Grade Shorthorns—														
*No. 76	2	Apr. 10, 1927	306·5	5,274·3	17·21	4·05	254·01	114 30	25 30	139 60	90 81	1 722	0 358	48 79
Averages—														
Pure-bred Ayshires	.....	.....	276·3	5,313·7	19·23	4·02	254·05	114 32	25 50	139 83	102 90	1 936	0 405	36 93
Grade Ayshires	.....	.....	334·2	7,519·2	22·50	3·98	357·07	160 68	36 10	196 78	131 79	1 752	0 370	64 99
Pure-bred Shorthorns	.....	.....	258·8	3,298·7	12·75	4·36	171·28	77 08	15 77	92 85	76 43	2 317	0 446	16 42
Grade Shorthorns	.....	.....	306·5	5,274·3	17·21	4·05	254·01	114 30	25 30	139 60	90 81	1 722	0 358	48 79

* Aborted.

per cent of dry matter is equal to 100 pounds of hay. On account of the O.P.V. silage containing a higher percentage of dry matter than the sunflower silage, it is given a higher value per ton.

The value of roots is arrived at in a similar manner except that the dry matter in roots is given a valuation of 15 per cent more than the dry matter in the silage. This makes 600 pounds of roots containing 10 per cent dry matter equal to 100 pounds of cured hay.

The actual cost of producing these different crops will be found in the Field Husbandry section of this report.

FEED COST OF REARING AYRSHIRE AND SHORTHORN CATTLE

A record is kept of the feed consumed by all of the young stock from date of birth until the males are sold for breeding and the females have freshened. From these data it is possible to calculate the feed requirements to different ages and the feed cost of same. The average age of the Ayrshires at the time of freshening is 2 years 7·4 months and the Shorthorn 2 years 6·3 months. In the calculation of the costs, the skim-milk was charged at 50 cents per 100 pounds, the whole milk at $2 per 100 pounds and the other feeds used at average farm market values.

The results in detail are presented in the following table:—

FEED COST OF REARING AYRSHIRE AND SHORTHORN CATTLE

Period	Number of animals	Whole milk	Skim-milk	Meal	Hay	Straw	Silage	Roots	Pasture	Cost
	No.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	days	$ cts.
Ayshire females—										
To 1 year	36	712	2,438	661	1,092	2	2,037	.....	73	56 59
To 2 years	25	677	2,435	1,111	2,868	182	7,988	23	202	100 44
To freshening	17	649	2,868	1,593	4,276	477	10,424	271	284	127 50
Ayrshire males—										
To 6 months	13	1,016	1,824	298	410	.....	430	.....	.....	39 54
To 1 year	4	896	2,622	1,184	1,703	.....	2,379	.....	.....	74 03
Shorthorn females—										
To 1 year	15	717	2,118	621	1,061	17	1,803	.....	81	53 48
To 2 years	10	749	2,081	1,132	3,009	160	6,745	.....	225	97 31
To freshening	7	804	2,089	1,407	4,351	229	10,336	114	281	126 24
Shorthorn males—										
To 18 months	1	800	1,850	1,662	3,193	.....	3,450	.....	103	92 28

SUNFLOWER VERSUS O.P.V. SILAGE FOR MILK PRODUCTION

Sunflowers and a mixture of oats, peas and vetch are the two crops most commonly grown in northern Ontario at the present time for silage purposes. The main object of this experiment is to determine the relative feeding value of these two silages for milk production. For this test ten milking cows were selected which were in such a stage of lactation that each would continue milking throughout the following four thirty-day periods which the experiment was to cover. This experiment has been conducted for a period of six years. In 1928 the ten cows used consisted of six pure-bred Ayrshires and four grade Ayrshires. The experiment commenced on November 15, 1927. Each animal received a uniform ration during the whole period, differing only in the variety and quantity of silage fed. The quantity of silage was determined by the percentage of dry matter which each contained, so that the amount of dry matter given would remain constant. During periods 1 and 3 each cow received 50 pounds per day of sunflower silage, while during periods 2 and 4 the O.P.V. was given at the rate of 36 pounds each per day.

Seven days are taken to transfer from one silage to the other at the beginning of each period. The milk records are calculated on the last twenty-one days in each thirty-day period, so that the cows are really two full days on the unmixed silage before the milk yields are considered. Besides the silage each cow got 12 pounds of hay per day, and five received 30 pounds each of roots per day. The grain mixture was fed in accordance with the individual requirements of the cows, and varied from 8 to 18 pounds each per day. The results to date are given in the following table:—

SUNFLOWER VERSUS O.P.V. SILAGE FOR MILK-PRODUCTION

Items		Average results 1928	Average results 1928	Six-year average 1923-28	Six-year average 1923-28
Experimental ration		Sunflowers	O.P.V.	Sunflowers	O.P.V.
Number of cows in test	No.	10	10	10	10
Milk produced by 10 cows in 21 days	lb.	5,403·40	5,305·25	5,245·87	5,175·67
Average milk per cow per day	"	25·73	25·26	24·98	24·65
Average per cent fat	%	3·72	4·06	3·78	3·92
Fat produced by 10 cows in 21 days	lb.	201·25	215·25	198·04	202·63
Average fat per cow per day	"	0·96	1·03	0·94	0·96
Meal consumed in 21 days	"	2,394·0	2,394·0	2,555·0	2,555·0
Hay consumed in 21 days	"	2,520·0	2,520·0	2,383·50	2,383·50
Roots (mangels) consumed in 21 days	"	3,150·0	3,150·0	945·0	945·0
Silage consumed in 21 days	"	10,500·0	7,560·0	9,275·0	8,260·0
Meal consumed per 100 pounds milk produced	"	44·31	45·13	48·70	49·37
Hay consumed per 100 pounds milk produced	"	46·64	47·50	45·44	46·05
Roots consumed per 100 pounds milk produced	"	58·30	59·38	18·01	18·26
Silage consumed per 100 pounds milk produced	"	194·32	142·50	176·81	159·59
Meal consumed per 100 pounds fat produced	"	1,189·57	1,112·20	1,290·14	1,260·92
Hay consumed per 100 pounds fat produced	"	1,252·17	1,170·73	1,203·54	1,176·28
Roots consumed per 100 pounds fat produced	"	1,565·22	1,463·41	477·18	466·37
Silage consumed per 100 pounds fat produced	"	5,217·39	3,512·20	4,683·40	4,076·40
Findings from experiment—					
Cost of meal mixture	$	50 27	50 27	50 21	50 21
Value of hay fed	$	18 90	18 90	17 09	17 09
Value of roots fed	$	2 36	2 36	0 76	0 76
Value of silage fed	$	25 46	21 92	18 74	23 81
Total cost of feed	$	96 99	93 45	86 80	91 87
Feed cost to produce 100 pounds milk	$	1 79	1 76	1 65	1 78
Feed cost to produce 100 pounds fat	$	48 19	43 41	43 83	45 34

DEDUCTIONS.—The data in this table would seem to indicate that either sunflower or O.P.V. silage may be used successfully as a winter feed for dairy cows.

Both in 1928 and in the six-year average the sunflowers have given a little the better results in milk production.

In feed cost to produce 100 pounds of milk and fat the O.P.V. shows some advantage in 1928, but in the six-year average for these factors the advantage is in favour of the sunflowers.

SUNFLOWER VERSUS O.P.V. SILAGE FOR GROWING CALVES

The object of this experiment is to determine the relative value of these two silages as a feed for growing calves. This experiment has also been conducted for six years, and it has covered the same periods each year as the one with milking cows.

In 1928, the calves on this test consisted of three pure-bred Shorthorns, one grade Shorthorn, two pure-bred Ayrshires and four grade Ayrshires. They were

weighed at the beginning and end of each thirty-day period. Their ration remained constant for the four periods except for the kind and quantity of silage fed.

As the calves varied some in age and size, it was found necessary to vary the amount of feed given to each to some extent, with the exception of the grain which was fed to one calf only, at the rate of 3 pounds per day. Each silage was fed so that an equal amount of dry matter would be given and the hay varied from 6 to 9 pounds each per day depending on the size of the calf. The grain mixture consisted of equal parts of bran, whole oats and oilcake.

The results to date are given in the following table:—

SUNFLOWER VERSUS O.P.V. SILAGE FOR GROWING CALVES

Items		Average results 1928	Average results 1928	Six-year average 1923-28	Six-year average 1923-28
Experimental ration		Sunflowers	O.P.V.	Sunflowers	O.P.V.
Number of calves in experiment	No.	10	10	10	10
Total gain of ten calves in 30 days	lb.	316·50	275·50	373·83	329·58
Average daily gain per calf	"	1·06	0·92	1·25	1·10
Meal consumed in 30 days	"	90·0	90·0	965·0	965·0
Hay consumed in 30 days	"	2,400·0	2,400·0	2,290·0	2,290·0
Silage consumed in 30 days	"	11,355·0	7,965·0	7,203·0	6,187·50
Meal consumed per 100 pounds gain	"	28·44	32·67	258·14	292·80
Hay consumed per 100 pounds gain	"	758·29	871·14	612·58	694·82
Silage consumed per 100 pounds gain	"	3,587·68	2,891·11	1,926·81	1,877·39
Findings from experiment—					
Cost of meal mixture	$	1 89	1 89	20 19	20 19
Value of hay	$	18 00	18 00	16 25	16 25
Value of silage	$	27 54	23 10	14 17	17 68
Total cost of feed	$	47 43	42 99	51 15	54 12
Feed cost to produce 100 pounds gain	$	14 99	15 60	13 68	16 42

DEDUCTIONS.—These figures show larger gains and at a lower cost per pound for the sunflower silage, both this year and in the six-year average.

BEEF CATTLE

On December 31, the herd of beef cattle totalled ten head. Of this number nine are pure-bred Shorthorns and one is a grade Shorthorn.

The herd sire, Comet —176360—, was bred by Mr. Harry Hughes, of Balderson, Ontario. He is sired by Roan Comet —156602—, a bull with excellent breeding from the standpoint of milk production. His dam is Lady Belle —107521—, with a five-year-old record of 14,754 pounds of milk in 365 days.

SUNFLOWER VERSUS O.P.V. SILAGE FOR WINTERING BEEF CATTLE

The object of this experiment is to determine the relative value of sunflower and O.P.V. silage when used as a major portion of the winter ration for dry cattle. This test has been conducted for six years and has covered the same four periods each year as those with milking cows and growing calves.

In 1928, ten head of dry cattle were selected and weighed on November 15. The ration given to each animal over the four thirty-day periods was identical with the exception of the variety and quantity of silage fed. During periods one and three they received sunflower silage, and during periods two and four O.P.V. was given. Each silage was fed so that an equal quantity of dry matter would be given, and the hay was fed at the rate of 10 pounds each per day. No grain was fed this year in this experiment.

The results to date are shown in the following table:—

SUNFLOWER VERSUS O.P.V. SILAGE FOR BEEF CATTLE

Items		Average results 1928	Average results 1928	Six-year average 1923-28	Six-year average 1923-28
Experimental ration		Sunflowers	O.P.V.	Sunflowers	O.P.V.
Number of cattle in experiment	No.	10	10	10	10
Total gain of ten cows in 30 days	lb.	340·0	345·50	292·25	264·50
Average daily gain per cow	"	1·13	1·15	0·97	0·88
Meal consumed by 10 cows in 30 days	"	.....	.....	210·0	210·0
Hay consumed by 10 cows in 30 days	"	3,000·0	3,000·0	3,100·0	3,100·0
Silage consumed by 10 cows in 30 days	"	14,400·0	10,320·0	10,625·0	9,195·0
Meal consumed per 100 pounds gain	"	.....	.....	71·86	79·40
Hay consumed per 100 pounds gain	"	882·35	868·31	1,060·74	1,172·02
Silage consumed per 100 pounds gain	"	4,235·29	2,986·98	3,635·59	3,476·37
Findings from experiment—					
Cost of meal mixture	$	.....	.....	3 95	3 95
Value of hay	$	22 50	22 50	20 69	20 69
Value of silage	$	34 92	29 93	21 71	26 59
Total cost of feed	$	57 42	52 43	46 35	51 23
Feed cost to produce 100 pounds gain	$	16 89	15 18	15 86	19 37

DEDUCTIONS.—The results in 1928 show greater gains and at a lower cost per pound for the O.P.V., while the average results over a six-year period are in favour of the sunflowers.

SHEEP

Pure-bred Shropshire is the breed of the sheep kept at this Statiton. At the present time the breeding flock consists of thirty-seven ewes, eight ewe lambs, and two rams.

During the year, thirty lambs were born. The average number of lambs born per ewe was 1·5, while the average over a ten-year period is 1·56 and the average number raised is 1·17, or 75 per cent.

SUNFLOWER VERSUS O.P.V. SILAGE FOR WINTERING LAMBS

The object of this experiment is to determine the relative value of sunflower and O.P.V. silage as a part of the ration for wintering lambs.

This experiment has been conducted for six years. In 1928, ten lambs were used and the test was commenced on November 17. The ration was exactly the same for the four thirty-day periods which the experiment covered with the exception of the kind of silage given. Sunflower silage was fed during periods one and three, and O.P.V. during periods two and four.

During the first five years of the test the ration given to each lamb consisted of silage 1 pound, clover hay 2 pounds, and grain ½ pound per day. In 1928, however, the amount of silage fed was determined by the percentage of dry matter which each contained, and consequently the O.P.V. was fed at the rate of 1 pound per day and the sunflowers at 1·5 pounds per day. The grain mixture was whole oats 3 parts, bran 1 part plus 5 per cent oilcake. The results are as follows:—

SUNFLOWER VERSUS O.P.V. SILAGE FOR WINTERING LAMBS

Items		Average results 1928	Average results 1928	Six-year average 1923-28	Six-year average 1923-28
Experimental ration		Sunflowers	O.P.V.	Sunflowers	O.P.V.
Number of lambs in test	No.	10	10	10	10
Total gain of ten lambs in 30 days	lb.	71·50	−10·50	68·55	53·32
Average daily gain per lamb	"	0·24	−0·04	0·23	0·18
Meal consumed in 30 days	"	150·0	150·0	150·0	150·0
Hay consumed in 30 days	"	600·0	600·0	600·0	600·0
Silage consumed in 30 days	"	450·0	300·0	325·0	300·0
Meal consumed per 100 pounds gain	"	209·79	.....	218·82	281·32
Hay consumed per 100 pounds gain	"	839·16	.....	875·27	1,125·28
Silage consumed per 100 pounds gain	"	629·38	.....	474·11	562·64
Findings from experiment—					
Cost of meal mixture	$	3 50	3 50	2 82	2 82
Value of hay	$	4 50	4 50	4 35	4 35
Value of silage	$	1 09	0 87	0 67	0 87
Total cost of feed	$	9 09	8 87	7 84	8 04
Feed cost to produce 100 pounds gain	$	12 71	.....	11 44	15 08

DEDUCTIONS.—These results are in favour of the sunflower silage, both this year and in the six-year average.

SWINE

Pure-bred Yorkshire is the breed of hogs kept at this Station. The herd of breeding stock on December 31, consisting of twelve sows and two boars. The senior boar is Ottawa Wonder 50 —124276—, a very good type of bacon hog. He is sired by Pine Grove Glory 9, —107847— which was bred by J. K. Featherstone. His dam is Dalmeny Maple Leaf 5 —88841— an imported sow from the herd of Geo. Sinclair, Edinburgh, Scotland.

The junior boar is Ottawa Augustus 350 —133678— a young boar with considerable promise. His sire is Orchard Grove Pat 76 —109848— bred by J. Lerch and Sons. His dam is Ottawa Augustine 240 —122309— which was bred at the Central Experimental Farm at Ottawa.

FEED COST OF MAINTAINING BROOD SOWS

A record is kept of the feed consumed by each sow during the year. A number of the sows spend a portion of the summer out on pasture and this is charged at the rate of 75 cents per month. The skim-milk used is charged at 50 cents per 100 pounds and the feeds at local market prices.

The accompanying table shows the figures for 1928 as well as the average for an eight-year period:—

FEED COST OF MAINTAINING BROOD SOWS

Items		1928	Eight-year average 1921-28
Number of sows	No.	7	11·5
Total grain consumed	lb.	21,631	29,536
Average grain per sow	lb.	3,090	2,568
Average grain per sow per month	lb.	258	214
Total cost of feed	$	498 76	579 83
Average cost of feed per sow	$	71 25	50 42
Average cost of feed per sow per month	$	5 94	4 20

FEED COST OF REARING PIGS TO TIME OF WEANING

A record is kept of the feed consumed by each sow from the time one litter is weaned until the next litter is ready to wean. From these data the feed cost of maintaining the sow from weaning to farrowing and the feed cost of rearing the pigs to time of weaning may be calculated. The following table shows the figures for 1928 as well as the average for a five-year period:—

FEED COST OF REARING PIGS TO TIME OF WEANING

Items		1928	Four-year average 1924-28
From weaning to farrowing—			
Number of sows	No.	18	19·4
Average length of period	days	142·7	183·9
Total grain consumed	lb.	21,516·0	22,615·0
Average grain per sow	lb.	1,195·3	1,165·7
Total cost of feed	$	492 57	470 60
Average cost of feed per sow	$	27 37	24 26
Total service fee	$	36 00	38 80
Total cost	$	528 57	509 40
Average cost per sow	$	29 37	26 26
From farrowing to weaning—			
Number of sows	No.	17	19
Average length of period	day	50·7	56·7
Total grain consumed	lb.	9,261·0	12,705·0
Average grain per sow	lb.	544·8	654·9
Total cost of feed	$	207 20	271 14
Average cost of feed per sow	$	12 19	13 98
Deductions—			
Total number of pigs born	No.	189·0	204·2
Average number of pigs born per sow	No.	10·5	10·5
Total number of pigs raised	No.	131·0	153·2
Average number of pigs raised per sow	No.	7·3	7·9
Total cost	$	735 77	780 54
Total cost per sow	$	40 88	40 24
Average cost per pig to time of weaning	$	5 62	5 09

COST OF PRODUCING PORK

In connection with the cost of pork production over a period of four years, both with spring and fall pigs some interesting data have been accumulated. In arriving at these costs the same prices have been used for feeds consumed as in the other work with swine, viz., skim-milk at 50 cents per 100 pounds and the other feeds at average market prices.

COST OF PORK PRODUCTION

Items		Spring pigs	Fall pigs
Total number of pigs	No.	171	165
Total weight at finish	lb.	27,504·0	30,214·0
Average weight per pig	lb.	160·8	183·1
Total meal consumed	lb.	85,594·0	104,910·0
Total milk fed	lb.	9,171·0	23,318·0
Meal consumed per pig	lb.	500·5	635·8
Milk fed per pig	lb.	53·6	141·3
Meal consumed per 100 pounds weight	lb.	311·2	347·2
Findings—			
Total cost of pigs to time of weaning	$	888 52	804 90
Total cost of feed	$	1,836 16	2,535 42
Total cost	$	2,724 68	3,340 32
Average cost per pig at time of weaning	$	5 20	4 88
Cost of feed per pig	$	10 74	15 37
Total cost per pig	$	15 94	20 25
Cost per 100 pounds live weight	$	9 91	11 06

THE EFFECT OF SUPPLEMENTARY FEEDS IN FEEDING FALL PIGS DURING THE WINTER

Many farmers find it difficult to get satisfactory results from the feeding of fall pigs during the winter, even when the same ration that develops spring pigs successfully is supplied.

The object of this experiment is to compare the results obtained from each of the following supplementary feeds: (1) skim-milk, (2) ten per cent tankage, (3) six per cent tankage plus 3 per cent chopped alfalfa, (4) six per cent tankage plus alfalfa hay fed in racks, (5) six per cent tankage plus mangels, and (6) a four per cent increase in the oil meal plus four per cent chopped alfalfa, but no tankage or skim-milk.

For this experiment, sixty pure-bred Yorkshire pigs ranging in age from eight to nine weeks were selected and weighed on November 15. These were divided equally into six lots of ten pigs each. On account of the range in age between the individual pigs, it was thought advisable to sub-divide each lot into two pens, so that the pigs which were together would be more nearly equal in age and size and they would also have more room. All lots were housed in the main hog-pen under similar conditions.

The basic meal ration was the same for each lot and during the first 60 days consisted of ground oats 2 parts and 1 part each of ground barley, shorts and middlings plus 3 per cent oil meal. After the first 60 days the meal ration was composed of 2 parts each of ground oats and barley, and 1 part of shorts plus 3 per cent oil meal.

Each lot was fed until the average weight per pig was between 188 and 200 pounds except lot 6 which averaged only 130 pounds when the experiment was closed.

In calculating the cost of producing pork in this experiment the skim-milk was charged at 50 cents per 100 pounds and the other feeds at average market prices which are as follows:—

	Per cwt.
Ground oats	$ 2 47
Ground barley	2 70
Shorts	1 87
Middlings	1 90
Oil meal	2 87
Tankage	4 18
Alfalfa	1 00
Mangels	07½

THE EFFECT OF SUPPLEMENTARY FEEDS IN FEEDING FALL PIGS DURING THE WINTER

Items	Lot 1 milk	Lot 2 10 per cent tankage	Lot 3 6 per cent tankage plus 3 per cent chopped alfalfa	Lot 4 6 per cent tankage plus alfalfa hay in racks	Lot 5 6 per cent tankage plus mangels	Lot 6 Oil meal increased to 7 per cent plus 4 per cent chopped alfalfa
Number of pigs in each lot..... No.	10	10	10	10	10	10
Total weight of 10 pigs..... lb.	404·0	404·0	404·0	403·0	405·0	404·0
Average weight of each pig..... "	40·4	40·4	40·4	40·3	40·5	40·4
Final weight of 10 pigs..... "	1,886·0	1,990·0	1,959·0	1,970·0	2,001·0	1,304·0
Average weight of each pig..... "	188·6	199·0	195·9	197·0	200·1	130·4
Total gain of each lot..... "	1,482·0	1,586·0	1,555·0	1,567·0	1,596·0	900·0
Average gain of each pig..... "	148·2	158·6	155·5	156·7	159·6	90·0
Average number of days fed per pig. No.	157·2	144·3	154·4	144·1	151·0	199·6
Average daily gain per pig..... lb.	0·94	1·10	1·01	1·09	1·06	0·45
Feed consumed—						
Ground oats to each lot..... lb.	2,701·0	2,676·0	2,730·0	2,786·0	2,659·0	2,689·0
Ground barley to each lot..... "	2,401·0	2,320·0	2,345·0	2,371·0	2,316·0	2,220·0
Shorts to each lot..... "	1,351·0	1,339·0	1,365·0	1,392·0	1,330·0	1,346·0
Middlings to each lot..... "	300·0	320·0	305·0	321·0	284·0	271·0
Oil meal to each lot..... "	203·0	202·0	200·0	199·0	195·0	437·0
Tankage to each lot..... "	.....	610·0	408·0	382·0	399·0	.....
Alfalfa to each lot..... "	.....	.....	205·0	780·0	.....	261·0

THE EFFECT OF SUPPLEMENTARY FEEDS IN FEEDING FALL PIGS DURING THE WINTER—*Concluded*

Items		Lot 1 milk	Lot 2 10 per cent tankage	Lot 3 6 per cent tankage plus 3 per cent chopped alfalfa	Lot 4 6 per cent tankage plus alfalfa hay in racks	Lot 5 6 per cent tankage plus mangels	Lot 6 Oil meal increased to 7 per cent plus 4 per cent chopped alfalfa
Feed consumed—Concluded							
Mangels consumed per lot	lb.	.....	.....	.....	.....	3,949·0	.....
Milk fed per lot	"	8,457·0	.....	.....	.....	.....	.....
Total grain ration per lot (tankage included)	"	6,956·0	7,476·0	7,353·0	7,451·0	7,183·0	6,963·0
Average grain ration per pig per day	"	4·42	5·17	4·76	5·17	4·76	3·49
Average alfalfa per pig per day	"	.....	.....	0·13	0·54	.....	0·13
Average mangels per pig per day	"	.....	.....	.....	.....	2·62	.....
Average milk per pig per day	"	5·38	.....	.....	.....	.....	.....
Amount of meal per 100 pounds gain	"	469·37	471·37	472·86	475·49	450·06	773·67
Total cost of feed per lot	$	210 62	191 16	186 92	194 44	183 72	171 83
Cost of feed to produce 100 pounds gain	$	14 21	12 05	12 02	12 41	11 51	19 09
Two year average cost of feed to produce 100 pounds gain	$	12 52	10 28	9 91	10 12	9 60	12 43

DEDUCTIONS.—Comparing lots one and two it is found that lot two made the better gains and at a lower cost per 100 pounds, the difference in cost being $2.16. This might be taken to indicate that when tankage can be purchased at $4.18 per cwt., the skim-milk is not worth 50 cents per 100 pounds. In fact, these figures show it to have a value of only 12 cents per 100 pounds.

When lots three and four are compared with lot two it is found that the gains made are slightly lower.

The alfalfa as fed to lot four in racks has given slightly larger gains than when chopped and mixed in the meal as feed to lot three; but the cost per 100 pounds gain has also been increased owing to the greater amount of alfalfa fed.

Lot five, which received mangels in place of alfalfa, has made the largest gains this year and at the lowest cost per 100 pounds, both this year and in the two-year average.

With lot six, where the animal protein as furnished in the skim-milk or tankage was replaced with vegetable protein by increasing the oil meal from 3 to 7 per cent and also increasing the chopped alfalfa from 3 to 4 per cent, it is found that a marked reduction in gain occurred both this year and in the two-year average. The cost of producing 100 pounds gain is much higher than any of the others this year. From observation it could easily be seen that lot six did not thrive like the other lots in the experiment.

HORSES

At the present time twenty horses are kept at this Station. Sixteen of these are heavy work horses. Three are pure-bred French Canadians, two mares and a two-year-old colt, and one is a driving horse.

Records are kept of the feed consumed and the number of hours of work performed by each horse. From these data are calculated the feed cost of maintenance and the feed cost of horse labour per hour.

In arriving at these figures the hay was charged at local farm prices, that is, the amount it would sell for on the farm without being pressed or hauled, while the grain was charged at local market prices. The results in detail are presented in the following table:—

Items		1928	Six-year average
Average number of horses fed	No.	17·4	14·9
Total hours worked	No.	48,287	39,333
Average hours per horse	No.	2,775	2,640
Average hours per horse per day	No.	9·3	8·8
Total hay fed	lb.	125,042	103,860
Total grain fed	lb.	101,827	84,701
Total days on pasture	days	.....	43
Average hay per horse	lb.	7,186	6,970
Average grain per horse	lb.	5,852	5,685
Average days on pasture per horse	days	.....	2·9
Average hay per horse per day	lb.	19·6	19·1
Average grain per horse per day	lb.	16·0	15·6
Findings—			
Cost of hay consumed	$	1,062 86	742 92
Cost of grain consumed	$	2,515 13	1,728 97
Cost of pasture	$	.....	4 27
Total cost of feed	$	3,577 99	2,476 16
Average cost of feed per horse	$	205 63	166 19
Average cost of horse labour per hour	cts.	7·4	6·3

FIELD HUSBANDRY

ROTATION OF CROPS

In order to ascertain the most practical and suitable rotations to use in northern Ontario, a comprehensive experiment in crop rotations was established in 1922. In this experiment one acre is included for each year that the rotation covers, making three acres for a three-year rotation, four acres in a four-year rotation, and so on. The area on which these rotations are established is a clay-loam soil which is apparently fairly uniform, although a few narrow strips of shallow muck are present. These are running crosswise of the rotations, however, and therefore should not materially affect the accuracy of the test. All these rotations have completed one full cycle, and some of the shorter ones nearly two.

In arriving at the cost of production figures, a record is kept of all items involved and a value is set on all products produced. These form a basis by which to compare the rotations. In arriving at these costs, actual prices are used wherever possible, such as the cost of labour, seed, twine, etc. The rent of the land is arrived at by multiplying the value of the land by the current rate of interest, on first mortgage plus taxes. The charge for machinery includes interest on investment, depreciation charges and a percentage for repairs. The cost of horse labour is calculated on the basis of the cost of maintenance for one year divided by the number of hours' work done.

The return values are based on the current market prices under local conditions for all crops that are saleable for the silage and root crops, it is assumed that 300 pounds of ensilage containing 25 per cent dry matter and 600 pounds of roots containing 10 per cent dry matter are each equal to 100 pounds of cured hay.

The prices and return values used in the 1928 report are as follows:—

PRICES USED IN FIGURING COST OF PRODUCING CROPS

Expenses

Rent	per acre	$ 4 75
Use of machinery	per acre	2 85
Manure	per ton	2 00
Threshing (oats, barley)	per bushel	0 07
Threshing (wheat)	per bushel	0 15
Ensiling	per ton	0 71
Manual labour	per hour	0 35
Teamsters	per hour	0 36
Horse labour (single)	per hour	0 10
Tractor and operator	per hour	1 85
Potatoes	per bushel	2 05
Turnip seed	per pound	0 75
Barley	per bushel	1 80
Wheat (spring)	per bushel	3 35
Wheat (fall)	per bushel	3 35
Buckwheat	per bushel	2 30
Oats	per bushel	2 01
Peas	per bushel	3 90
Vetch	per bushel	4 30
Sunflower seed	per pound	0 13
Corn	per pound	0 05
Timothy	per pound	0 10
Red Clover	per pound	0 37
Alsike	per pound	0 26
Sweet Clover	per pound	0 11
Twine	per pound	0 13

Return Values

Peas	per bushel	$ 2 50
Barley	per bushel	1 05
Wheat	per bushel	1 35
Oats	per bushel	0 71
Potatoes (marketable)	per bushel	0 90
Potatoes (unmarketable)	per ton	3 00
Hay	per ton	14 00
Straw (barley, oats)	per ton	5 60
Straw (wheat)	per ton	2 80
Sunflower silage	per ton	3 50
O.P.V. silage	per ton	4 80
Corn silage	per ton	3 50
Turnips	per ton	3 00

Following is a brief description of each rotation under test and the results obtained to date:—

ROTATION A (THREE YEARS' DURATION)

This rotation includes sunflowers, oats, and clover hay. The clover sod is manured at the rate of 12 tons per acre and fall-ploughed for sunflowers. The land is again fall-ploughed in preparation for seeding to grass and clover, using oats as a nurse-crop. The results in 1928 from the different crops are as follows:—

ROTATION A (THREE YEARS' DURATION)—RESULTS IN 1928

Rotation year	Crop		Yield per acre		Value of crop, 1928	Cost of production	Profit or loss per acre	
			1928	Average 4 years			1928	Average 4 years
					$ cts.	$ cts.	$ cts.	$ cts.
1	Sunflowers	ton	10·90	8·31	38 15	46 57	−8 42	−15 23
2	Oats (Alaska) straw	ton	0·63	0·68	.....	.....	.....	.....
	Oats (Alaska) grain	bush.	28·10	26·00	23 48	30 45	−6 97	− 8 02
3	Clover hay	ton	2·13	1·51	29 82	20 79	9 03	0 71
	Average per acre	.....	.....	.....	30 48	32 60	−2 12	− 7 52

ROTATION B (FOUR YEARS' DURATION)

This rotation includes sunflowers, oats, clover hay and timothy hay. The timothy sod is manured at the rate of 16 tons per acre and fall-ploughed for sunflowers. After the sunflowers are removed, the land is again fall-ploughed for oats, which are used as the nurse-crop for the grass and clover seed. The results in 1928 from the different crops are as follows:—

ROTATION B (FOUR YEARS' DURATION)—RESULTS IN 1928

Rotation year	Crop		Yield per acre		Value of crop, 1928	Cost of production	Profit or loss per acre	
			1928	Average 4 years	1928		1928	Average 4 years
					$ cts.	$ cts.	$ cts.	$ cts.
1	Sunflowers	ton	10·31	9·36	36 09	47 76	−11 67	−13 81
2	Oats (Alaska) straw	ton	0·63	0·67				
	Oats (Alaska) grain	bush.	32·40	27·90	26 53	33 95	− 7 42	−9 74
3	Clover hay	ton	1·66	1·50	23 24	19 99	3 25	0 85
4	Timothy hay	ton	1·66	1·49	23 24	16 38	6 86	4 81
	Average per acre				27 28	29 52	−2 24	−4 47

ROTATION C (FIVE YEARS' DURATION)

This rotation includes oats, sunflowers, barley, clover hay and timothy hay. The timothy sod is fall-ploughed for oats. The oat stubble is manured at the rate of 12 tons per acre and fall-ploughed for sunflowers. After the sunflowers are removed, the land is again fall-ploughed for barley which is the nurse-crop for the grass and clover. After the clover hay is cut, a top dressing of manure is applied at the rate of 8 tons per acre. The results in 1928 from the different crops are as follows:—

ROTATION C (FIVE YEARS' DURATION)—RESULTS IN 1928

Rotation year	Crop		Yield per acre		Value of crop, 1928	Cost of production	Profit or loss per acre	
			1928	Average 4 years	1928		1928	Average 4 years
					$ cts.	$ cts.	$ cts.	$ cts.
1	Oats (Alaska) straw	ton	0·67	0·95				
	Oats (Alaska) grain	bush.	36·50	38·70	29 67	30 33	−0 66	1 40
2	Sunflowers	ton	14·10	10·11	49 35	51 62	−2 27	−9 70
3	Barley straw	ton	0·75	0·77				
	Barley grain	bush.	30·20	28·00	35 91	29 96	5 95	0 48
4	Clover hay	ton	1·82	1·43	25 48	19 37	6 11	1 08
5	Timothy hay	ton	1·54	1·63	21 56	21 98	−0 42	1 12
	Average per acre				32 39	30 65	1 74	−1 12

ROTATION D (SIX YEARS' DURATION)

This rotation includes potatoes, wheat, barley, clover hay and timothy hay for two years. The timothy sod is manured at the rate of 16 tons per acre and fall-ploughed for potatoes. After the potatoes are dug, the land is again fall-ploughed for wheat, and is also fall-ploughed for barley, which is the nurse-crop for seeding out with. The new seeding is given a top dressing of manure at the rate of 8 tons per acre after the barley is harvested. The results in 1928 from the different crops are as follows:—

ROTATION D (SIX YEARS' DURATION)—RESULTS IN 1928

Rotation year	Crop		Yield per acre		Value of crop, 1928	Cost of production	Profit or loss per acre	
			1928	Average 4 years	1928		1928	Average 4 years
					$ cts.	$ cts.	$ cts.	$ cts.
1	Potatoes {unmarketable	ton	0·50	0·37				
	{marketable	bush.	141·50	122·79	128 85	87 52	41 33	48 64
2	Wheat (Garnet) {straw	ton	0·96	1·22				
	{grain	bush.	24·30	19·30	35 50	34 57	0 93	−0 92
3	Barley {straw	ton	0·74	0·79				
	{grain	bush.	30·00	26·00	35 64	28 17	7 47	0 60
4	Clover hay	ton	1·52	1·49	21 28	22 66	−1 38	−1 28
5	Timothy hay	ton	2·16	1·55	30 24	18 15	12 09	3 79
6	Timothy hay	ton	1·16	1·29	16 24	15 38	0 86	2 91
	Average per acre				44 63	34 41	10 22	8 96

ROTATION E (FIVE YEARS' DURATION)

Oats, summer-fallow, fall wheat, clover hay and timothy hay are included in this rotation.

The summer-fallow replaces the hoed crop as a means of cleaning the land, and the fall wheat replaces the barley as a grain crop.

The timothy sod is fall-ploughed for the oat crop and clover seed. The clover is allowed to grow until it is a fair height when it is ploughed under together with an application of manure at the rate of 8 tons per acre. After ploughing, the land is disked occasionally until the latter part of August, when the fall wheat is sown together with the timothy seed. The clover is sown the following spring. After the clover hay is cut during the fourth year of rotation, a top dressing of manure at the rate of 8 tons per acre is applied for the benefit of the next two crops.

In 1928, Kharkov fall wheat was the variety used, and although this is considered as a very hardy variety, it suffered to such an extent from winter killing that it was thought advisable to reseed it with Garnet spring wheat, hence the crop this year was a mixture of these two sorts.

The results in 1928 from the different crops are as follows:—

ROTATION E (FIVE YEARS' DURATION)—RESULTS IN 1928

Rotation year	Crop		Yield per acre		Value of crop, 1928	Cost of production	Profit or loss per acre	
			1928	Average 4 years	1928		1928	Average 4 years
					$ cts.	$ cts.	$ cts.	$ cts.
1	Oats (Alaska) {straw	ton	0·53	0·71				
	{grain	bush.	34·10	34·50	27 18	31 25	−4 07	−4 86
2	Summer-fallow							
3	Wheat {straw	ton	1·04	1·12				
	{grain	bush.	16·70	13·00	25 46	45 17	−19 71	−25 94
4	Clover hay	ton	1·98	1·45	27 72	26 01	1 71	−6 33
5	Timothy hay	ton	2·20	1·69	30 80	22 78	8 02	0 44
	Expense of seeding fall wheat							−1 73
	Average per acre				22 23	25 04	−2 81	−7 68

COST OF PRODUCING FARM CROPS

Records are kept on the cost of production for the various field crops grown. The figures which follow are in some cases from field areas which were not included in the rotations, while in other cases they represent an average of field areas and rotations.

COST OF PRODUCING SPRING WHEAT (GARNET)

The figures used in determining the cost of producing spring wheat represent one acre which was grown in the six-year rotation. The seed was sown on May 17, at the rate of 1¼ bushels per acre. The germination was good and a nice even stand developed. The crop was harvested on September 11, which made the period of maturing 117 days. The cost of production is as follows:—

Total cost per acre		$34 57
Yield of grain per acre	bush.	24·30
Yield of straw per acre	ton	0·96
Value of crop per acre		$35 50
Profit per acre		0 93
Cost per bushel		1 32
Cost per ton of straw		2 73

COST OF PRODUCING ALASKA OATS

The area in Alaska oats included 61·2 acres, 4 of which were in the rotations, 5 in the cultural experiments, and 52·2 in the regular field crop area. These were seeded from May 16 to 25, at the rate of 2½ bushels per acre. Being an early variety the grain matured very well and was harvested from August 23 to September 7. The quality of the grain was good. The cost of production is as follows:—

Total cost per acre		$24 85
Yield of grain per acre	bush.	24·80
Yield of straw per acre	ton	0·45
Value of crop per acre		$20 13
Loss per acre		4 72
Cost per bushel		0 88
Cost per ton of straw		6 91

COST OF PRODUCING BARLEY

The figures on the cost of producing barley are based on 35·1 acres, 8 of which were grown in the rotations and cultural experiments. The seed was sown from May 25 to June 5, at the rate of 2 bushels per acre. O.A.C. No. 21 was the variety used. The crop was harvested from September 5 to 13. The cost of production is as follows:—

Total cost per acre		$24 56
Yield of grain per acre	bush.	17·00
Yield of straw per acre	ton	0·38
Value of crop per acre		$19 96
Loss per acre		4 60
Cost per bushel		1 29
Cost per ton of straw		6 89

COST OF PRODUCING HAY

The standard hay mixture used is red clover 8 pounds, timothy 8 pounds, and alsike 2 pounds per acre. One-half of the cost of the grass and clover seed is charged to each year's crop, where the meadows are kept for two years.

The cost of production figures for hay include 22 acres in the rotations and cultural experiments, and 96·5 acres in the field areas. Haying commenced on July 23 and the cutting was completed on August 4. The cost of production is as follows:—

Total cost per acre		$15 24
Yield per acre	ton	1·36
Value per acre		$19 04
Profit per acre		3 80
Cost per ton		11 20

COST OF PRODUCING SUNFLOWERS

The figures on the cost of producing sunflowers are based on 16·3 acres, 4 of which were grown on the rotations and cultural experiments. The seed was planted from May 18 to 21, in rows 36 inches apart. The germination was good and a good average yield was obtained. The crop was harvested from September 18 to 25. The cost of production is as follows:—

Total cost per acre		$54 35
Yield per acre	ton	12·83
Value per acre		$44 91
Loss per acre		9 44
Cost per ton		4 24

COST OF PRODUCING OATS, PEAS, AND VETCH MIXTURE

The area from which these figures have been obtained includes 1 acre in the rotations and 30·8 acres under field crop. Only 4·7 acres received manure; 6·5 acres were on fall-ploughed sod and the remainder were on new land. The seed was sown from May 24 to June 5, and the crop was harvested and ensiled from August 27 to September 11. The cost of production is as follows:—

Total cost per acre		$30 49
Yield per acre	ton	2·82
Value per acre		$13 54
Loss per acre		16 96
Cost per ton		10 81

COST OF PRODUCING POTATOES

The 3·3 acres of potatoes from which these figures were obtained include 1 acre in the rotations and 2·3 acres under field crop. The land was manured at the rate of 16 tons to the acre and fall-ploughed.

The seed was planted from May 23 to 25, and the crop was harvested from October 1 to 4. The cost of production is as follows:—

Total cost per acre		$84 90
Yield of marketable potatoes	bush.	219·63
Yield of unmarketable potatoes	ton	0·36
Value of crop per acre		$198 75
Profit per acre		113 85
Cost per bushel of marketable potatoes		0 38
Cost per ton of unmarketable potatoes		1 28

CULTURAL EXPERIMENTS

RATE OF SEEDING SUNFLOWERS

The object of this experiment is to determine the rate of seeding which will give the largest yield and be the most satisfactory generally. In 1928 twelve

different rates were under test. The seed was sown on May 24, in quadruplicate one-fortieth acre plots, on fall-ploughed sod which was manured at the rate of 16 tons per acre previous to ploughing. The seed germinated well and a nice even stand developed. The results are as follows:—

RATE OF SEEDING SUNFLOWERS

Distance between rows	Distance between plants in row	Area occupied by each plant	Yield per acre							
			Green weight 1928		Dry weight 1928		Average green weight 1924-28		Average dry weight 1924-28	
inch.	inch.	sq. feet	tons	lb.	tons	lb.	tons	lb.	tons	lb.
24	6	1·0	24	333	2	1,966	14	1,873	2	104
24	12	2·0	23	760	2	1,500	13	1,364	1	1,542
24	18	3·0	19	1,080	2	399	12	182	1	1,167
30	6	1·25	27	1,587	3	28	15	389	1	1,898
30	12	2·50	23	1,293	2	1,140	13	815	1	1,374
30	18	3·75	20	1,653	2	955	12	501	1	1,172
36	6	1·50	24	1,707	2	1,371	15	43	1	1,649
36	12	3·00	22	1,827	2	1,361	13	1,453	1	1,445
36	18	4·50	19	1,293	2	820	12	213	1	1,168
42	6	1·75	22	1,707	2	1,085	14	1,461	1	1,762
42	12	3·50	20	1,147	2	643	12	891	1	1,179
42	18	5·25	16	1,667	1	1,570	10	1,639	1	642

The figures in this table would seem to indicate that the yield of sunflowers may be affected more by changing the distance between the plants in the row than by changing the distance between the rows.

It may be noticed in the average results of dry weight per acre over a five-year period that in every instance where the spacing of the plants in the row has been changed from 6 to 12 and 18 inches there has been a noticeable decrease in the yield; while on the other hand there has been a comparatively small decrease in the yield where the rows are widened from 24 to 30, 36 and 42 inches apart.

In order to make possible a more direct comparison between the average results from the rows different distances apart and also the plants at different distances within the row, the following table has been prepared:—

RATE OF SEEDING SUNFLOWERS. ROWS AND PLANTS AT DIFFERENT DISTANCES APART

Distance	Yield per acre							
	Green weight 1928		Dry weight 1928		Average green weight 1924-28		Average dry weight 1924-28	
	tons	lb.	tons	lb.	tons	lb.	tons	lb.
Rows 24 inches apart	22	724	2	1,288	13	1,140	1	1,604
Rows 30 inches apart	24	178	2	1,374	13	1,235	1	1,481
Rows 36 inches apart	22	942	2	1,184	13	1,236	1	1,421
Rows 42 inches apart	20	174	2	433	12	1,330	1	1,194
Plants 6 inches apart	24	1,834	2	1,613	14	1,942	1	1,853
Plants 12 inches apart	22	1,257	2	1,161	13	631	1	1,385
Plants 18 inches apart	19	423	2	436	11	1,634	1	1,037

This table also brings out quite vividly the greater tendency for the yields to lessen, as the plants are more widely spaced within the row, than where the rows are spaced at greater width.

While 24 inches between the rows has given the largest yield, this is not sufficient width to permit of convenient cultivation and harvesting, and 42 inches seems unnecessarily wide with a tendency to give coarse stalks and lower yields. A distance of 30 to 36 inches, with the plants around 6 inches apart in the row should prove a suitable spacing to use under ordinary farm conditions.

RATE OF SEEDING ENSILAGE CROPS

The object of this experiment is to compare the yield and quality of ensilage crops produced from various rates of seeding, using sunflowers, corn and different mixtures of oats, peas and vetch.

In 1928, twenty different mixtures and rates of seeding were under test. These were all seeded in quadruplicate one-fortieth-acre plots on fall-ploughed clay-loam soil which had been manured at the rate of 16 tons per acre for the previous crop. The three crops were seeded on June 1. The O.P.V. were harvested on September 6, the sunflowers on September 14, and the corn on September 17. Mammoth Russian sunflowers, North Western Dent corn, O.A.C. No. 72 oats, Mackay peas and Common vetch are the varieties used. The germination of the sunflowers and O.P.V. was good, but the corn was not more than half a stand. The results are as follows:—

DISTANCES BETWEEN ROWS AND RATE OF SEEDING ENSILAGE CROPS

Crops and rate						Yield per acre							
Sunflowers	Corn	Oats	Peas	Vetch	Clover	Green weight 1928		Dry weight 1928		Average green weight 1924-28		Average dry weight 1924-28	
inch.	inch.	lb.	lb.	lb.	lb.	tons	lb.	tons	lb.	tons	lb.	tons	lb.
24						12	370	1	1,208	17	634	2	251
30						13	210	1	1,397	16	1,144	1	1,953
36						10	1,480	1	817	15	1,194	1	1,915
42						10	490	1	775	13	899	1	1,310
	24					2	400	0	458	4	350	0	1,026
	30					2	510	0	453	4	344	0	984
	36					1	1,770	0	368	3	1,029	0	845
	42					1	1,330	0	336	2	1,713	0	676
		34	60			6	1 990	1	1 605	10	148	2	816
		51	60			8	120	2	147	10	324	2	928
		68	60			8	1,430	2	408	10	269	2	1,095
		34	60	28		9	1,360	2	371	11	385	2	893
		51	60	28		9	1,760	2	386	11	1,245	2	1,278
		68	60	28		9	1,620	2	323	11	661	2	1,115
		34	60		10	9	230	2	282	10	763	2	911
		51	60		10	8	1,390	2	109	10	701	2	960
		68	60		10	7	1,320	2	4	9	1,951	2	1,006
		34	60	28	10	7	1,650	1	1,638	10	1,755	2	766
		51	60	28	10	9	1,650	2	669	11	347	2	1,052
		68	60	28	10	8	500	1	1,922	10	1,855	2	1,135

The average figures in this table show that the largest yield has been obtained from rows 24 inches apart and the smallest yield from rows 42 inches apart with both sunflowers and corn. However, 24 inches apart has been found to be an inconvenient distance for cultivating and harvesting, consequently, either 30 or 36 inches is to be recommended in preference to either of the other two.

In order to make possible a more direct comparison between the different rates of seeding the O.P.V. the following table has been prepared:—

AVERAGE OF THE DIFFERENT RATES OF O.P.V.

Plots averaged	Yield per acre	
	Average green weight 1924-28	Average dry weight 1924-28
	tons lb.	tons lb.
Where 34 pounds of oats are included (4 plots)	10 1,263	2 847
Where 51 pounds of oats are included (4 plots)	10 1,654	2 1,055
Where 68 pounds of oats are included (4 plots)	10 1,184	2 1,088
Where oats and peas are sown (3 plots)	10 247	2 946
Where oats, peas and vetch are sown (3 plots)	11 764	2 1,095
Where oats, peas and clover are sown (3 plots)	10 472	2 959
Where oats, peas, vetch and clover are sown (3 plots)	10 1,986	2 984

The figures in this table indicate that there is a slight tendency for the yield to increase as the amount of oats included in the mixture has been increased.

The figures also show some advantage where the vetch is present, but the addition of the clover has failed to augment the yield.

It is really remarkable the very excellent yields that have been obtained, even with what might be considered as a rather light seeding of oats and peas.

DATE OF SEEDING ENSILAGE CROPS

The object of this experiment is to determine the best date or dates on which to seed the different ensilage crops using sunflowers, corn and a mixture of oats, peas and vetch. The sunflowers and corn were sown in drills 30 inches apart and the sunflowers were thinned 6 to 12 inches apart in the row, while the oats, peas and vetch were sown at the rate of 2 bushels of oats, 1 bushel of peas and ½ bushel of vetch per acre. Mammoth Russian sunflowers, Quebec 28 corn, O.A.C. No. 72 oats, Mackay peas and Common vetch were the varieties used.

In 1928, the seed was sown on six different dates at intervals of seven days commencing on May 23, on fall-ploughed clay-loam soil which was manured at the rate of 16 tons to the acre previous to seeding. The sunflowers and O.P.V. were seeded in quadruplicate one-fortieth-acre plots and the corn in one-eightieth-acre plots. The results are as follows:—

DATE OF SEEDING ENSILAGE CROPS

Crop	Date of seeding 1928	Yield per acre			
		Green weight 1928	Dry weight 1928	Average green weight 1924-28	Average dry weight 1924-28
		tons lb.	tons lb.	tons lb.	tons lb.
Sunflowers	May 23	26 1,560	3 524	19 1,423	2 1,196
Sunflowers	May 30	23 1,800	2 1,158	18 1,699	2 616
Sunflowers	June 6	23 1,750	2 1,646	18 890	2 569
Sunflowers	June 13	22 1,130	2 540	16 1,930	1 1,821
Sunflowers	June 20	21 1,380	2 744	15 1,118	1 1,579
Sunflowers	June 27	16 380	1 1,252	12 1,536	1 826
O.P.V.	May 23	15 1,190	3 246	11 1,740	2 1,749
O.P.V.	May 30	16 180	3 459	12 570	2 1,716
O.P.V.	June 6	16 1,540	2 1,850	12 485	2 1,208
O.P.V.	June 13	15 1,620	2 1,589	11 1,944	2 748
O.P.V.	June 20	16 1,950	2 1,449	11 1,922	2 329
O.P.V.	June 27	16 1,540	2 1,608	11 1,220	2 387
Corn	May 23	11 1,740	1 1,112	.....	.....
Corn	May 30	9 100	1 270	.....	.....
Corn	June 6	11 940	1 830	.....	.....
Corn	June 13	9 1,900	1 494	.....	.....
Corn	June 20	9 500	1 221	.....	.....
Corn	June 27	5 1,220	0 1,309	.....	.....

The figures in this table indicate that there is a general tendency for the earlier seedings of both sunflowers and O.P.V. to give the better results. In fact, over a five-year period the first seeding has given the largest yield. In this connection, however, it is interesting to note that these crops, particularly the O.P.V., may be seeded until quite late and still give fairly good results. This may sometimes prove a distinct convenience, particularly on an area of low-lying land which may be slow in drying up in the spring.

GREEN MANURE EXPERIMENTS

PLOUGHING DOWN SWEET CLOVER AND SUMMER-FALLOWING

The object of this experiment is to determine the value, if any, of sweet clover as a green manure when used in conjunction with a summer-fallow. This experiment was commenced in 1922 on virgin clay-loam soil, which had never received any fertilizer of any kind. It is operated on a five-year rotation including oats, sweet clover, barley, clover hay, and timothy hay. The land is fall-ploughed for the oat crop. When the sweet clover has attained a fair growth it is ploughed under, and the land is cultivated occasionally throughout the remainder of the season. The results from the different crops are as follows:—

PLOUGHING DOWN SWEET CLOVER AND SUMMER-FALLOWING—RESULTS IN 1928

Rotation year	Crops and treatment	Yield per acre		Cost of summer-fallowing, 1928	Value of crop minus cost of summer-fallowing	
		1928	Average 4 years		1928	Average 4 years
				$ cts.	$ cts.	$ cts.
1	Oats (Alaska) straw ton	0·52	0·60	.....	.....	.....
	Oats (Alaska) grain bush.	24·70	22·20	.....	20 45	19 22
2	Sweet clover ploughed down and summer-fallowed					
3	Barley straw ton	0·58	0·83	.....	.....	.....
	Barley grain bush.	18·50	21·80	8 40	14 28	18 52
4	Clover hay ton	1·07	1·01	4 20	10 78	10 77
5	Timothy hay ton	1·24	1·06	.....	17 36	14 83
	Average per acre	.....	.....	2 52	12 57	12 67

PLOUGHING DOWN SWEET CLOVER AND BUCKWHEAT

The objects of this experiment are to determine the respective value, if any, of sweet clover, ploughed under, and the practice of using an additional crop of buckwheat, one-half acre of which is also ploughed under and one-half acre harvested for grain. This experiment was commenced in 1922, on virgin clay-loam soil, which had never received any fertilizer. It is operated on a five-year rotation, including oats, sweet clover and buckwheat, barley, clover hay and timothy hay. The land is fall-ploughed for the oat crop. The sweet clover is allowed to grow until it is time to prepare the soil for buckwheat. While the buckwheat is still green, one-half acre is ploughed under and the other half is ploughed after the crop is harvested, in preparation for barley the next year, which is the nurse-crop for the grass and clover. The results from the different crops are as follows:—

PLOUGHING DOWN SWEET CLOVER AND BUCKWHEAT—RESULTS IN 1928

Rotation year	Crops and treatment	Yield per acre		Cost of summer-fallowing, 1928	Value of crop minus cost of summer-fallowing	
		1928	Average 4 years		1928	Average 4 years
				$ cts.	$ cts.	$ cts.
1	Oats (Alaska) straw ton	0·35	0·57	.....	.....	.....
	grain bush.	21·80	22·80	.....	17 44	20 03
2	Sweet clover ploughed down buckwheat sown, ½ acre threshed.					
	straw ton	0·25	0·06	.....	.....	.....
	grain bush.	7·30	1·80	.....	8 73	2 18
3	Barley straw ton	0·47	0·63	.....	.....	.....
	grain bush.	16·30	15·60	13 61	6 14	5 42
4	Clover hay ton	0·65	0·78	6 81	2 29	4 16
5	Timothy hay ton	0·86	0·85	.....	12 04	12 09
	Average per acre	.....	.....	4 08	9 33	8 77

The yield for buckwheat is for one-half acre.

NO GREEN MANURE CROP PLOUGHED DOWN

In this experiment no green manure crop is ploughed down, but a legume grain is introduced to supplement the clover crop in building up the soil. It was commenced in 1922 under a four-year rotation, including peas, oats, clover hay and timothy hay. In 1927, however, it was decided to replace the oat crop by barley in order to make possible a more direct comparison between this and the other experiment. The timothy sod is fall-ploughed for peas. After the pea crop is harvested, the land is again fall-ploughed in preparation for seeding to grass and clover using barley as a nurse-crop. The results from the different crops are as follows:—

NO GREEN MANURE CROP PLOUGHED DOWN—RESULTS IN 1928

Rotation year	Crop	Yield per acre		Value of crop	
		1928	Average 2 years	1928	Average 2 years
				$ cts.	$ cts.
1	Peas straw ton	0·22	0·68	.....	.....
	grain bush.	8·30	16·70	21 37	52 06
2	Barley straw ton	0·36	0·81	.....	.....
	grain bush.	16·00	22·10	18 82	27 71
3	Clover hay ton	0·57	0·52	7 98	7 99
4	Timothy hay ton.	0·83	0·77	11 62	11 76
	Average per acre	.....	.....	14 95	24 88

EFFECT OF GROWING NON-LEGUMES, LEGUMES, AND OF PLOUGHING UNDER GREEN MANURE

The object of this experiment is to use it as a check or base with which to compare the other experiments. It was commenced in 1922 under a four-year rotation, including oats, barley, clover hay and timothy hay. The timothy sod is fall-ploughed for the oat crop. After harvest the land is again fall-ploughed in preparation for barley which is the nurse-crop for the grass and clover. The results from the different crops are as follows:—

EFFECT OF GROWING NON-LEGUMES—RESULTS IN 1928

Rotation year	Crop		Yield per acre		Value of crop	
			1928	Average 4 years	1928	Average 4 years
					$ cts.	$ cts.
1	Oats (Alaska) straw	ton	0·34	0·52	.....	.....
	Oats (Alaska) grain	bush.	28·80	24·00	22 35	19 98
2	Barley straw	ton	0·35	0·40	.....	.....
	Barley grain	bush.	15·60	14·10	18 34	16 29
3	Clover hay	ton	0·68	1·02	9 52	14 35
4	Timothy hay	ton	0·84	0·91	11 76	12 94
	Average per acre		.....	.....	15 49	15 89

FARM MANURE EXPERIMENT

The object of this experiment is to compare the effect of manure applied in two applications, 8 tons disked in for barley and 8 tons applied on the clover stubble for timothy, with green manure ploughed down and with no manure of any kind. This experiment was commenced in 1922 under a four-year rotation including oats, barley, clover hay and timothy hay. The land is fall-ploughed for oats. After the oats are harvested, it is again fall-ploughed and seeded out to grass and clover the next spring using barley as a nurse-crop. The results from the different crops are as follows:—

FARM MANURE EXPERIMENT—RESULTS IN 1928

Rotation year	Crops and treatment		Yield per acre		Cost of manure	Value of crop minus cost of manure	
			1928	Average 4 years		1928	Average 4 years
					$ cts.	$ cts.	$ cts.
1	Oats (Alaska) straw	ton	0·47	0·74	.....	.....	.....
	Oats (Alaska) grain	bush.	32·40	31·30	6 40	19 23	15 35
2	Barley straw	ton	0·80	0·76	.....	.....	.....
	Barley grain	bush.	15·00	21·50	9 60	10 63	15 69
3	Clover hay	ton	1·69	1·28	6 40	17 26	15 06
4	Timothy hay	ton	1·86	1·65	9 60	16 44	18 61
	Average per acre		.....	.....	8 00	15 89	16 18

LIME EXPERIMENT

The object of this experiment is to determine the results from the application of 2 tons of ground limestone per acre during the second year of the rotation. This experiment was commenced in 1922 under a four-year rotation, including oats, barley, clover hay, and timothy hay. The timothy sod is fall-ploughed for oats. After these are harvested, it is again fall-ploughed and given an application of ground limestone in addition to 8 tons of manure in preparation for seeding out to grass and clover using barley as a nurse-crop. After the clover hay is cut, a top dressing of manure at the rate of 8 tons per acre is applied for the benefit of the timothy hay and oat crop which follow. The results from the different crops are as follows:—

LIME EXPERIMENT—RESULTS IN 1928

Rotation year	Crops and treatment	Yield per acre		Cost of manure	Value of crop minus cost of manure	
		1928	Average 4 years		1928	Average 4 years
				$ cts.	$ cts.	$ cts.
1	Oats (Alaska) straw ton	0·56	0·92	.....	.....	.....
	Oats (Alaska) grain bush.	33·10	31·20	6 40	20 24	16 23
2	Barley straw ton	0·48	0·74	.....	.....	.....
	Barley grain bush.	17·30	22·60	9 60	11 26	16 72
3	Clover hay ton	1·38	1·21	6 40	12 92	10 86
4	Timothy hay ton	2·35	1·82	9 60	23 30	21 26
	Average per acre			8 00	16 93	16 27

DRAINAGE EXPERIMENT

The object of this experiment is to compare the results from tile-drained land with that which is not tile drained. For this test 20 acres of uniform clay-loam soil, which had some shallow muck areas in each half, were selected. Ten acres of this area were under-drained in 1921 with four tile drains, while the other 10 acres were left undrained.

The whole area was placed under the following four-year rotation:—

First year.....Sunflowers or O.P.V.
Second year.....Oats
Third year.....Clover hay
Fourth year.....Timothy hay

The results in 1928 from the Alaska Oats are as follows:—

DRAINAGE EXPERIMENT—RESULTS IN 1928

Items	Drained	Undrained
Total cost per acre ... $	27 65	26 60
Yield of grain per acre ... bush.	36·44	21·50
Yield of straw per acre ... ton	0·65	0·72
Value of crop per acre ... $	29 53	19 29
Profit or loss per acre ... $	1 88	−7 31
Cost per bushel ... $	0 67	0 98
Cost per ton of straw ... $	5 24	7 72

The cost of drainage is not included in figuring the above cost of production.

SURFACE DRAINAGE EXPERIMENT

The object of this experiment is to compare the results from using four different widths of lands when ploughing as follows:—

First area.....18 feet in width
Second area.....24 feet in width
Third area.....36 feet in width
Fourth area.....48 feet in width

This experiment is operated under a four-year rotation, including sunflowers or O.P.V., oats, clover hay and timothy hay. The results from the clover hay in 1928 are as follows:—

SURFACE DRAINAGE EXPERIMENT—RESULTS IN 1928

Width of lands	Yield per acre
	ton
Lands 18 feet in width	2·19
Lands 24 feet in width	1·73
Lands 36 feet in width	1·20
Lands 48 feet in width	1·50

HORTICULTURE

ORCHARD

The orchard which was set out in 1918 made excellent growth during the summer, but each winter seems to kill off a percentage of the more tender trees. Those that are killed are being replaced each spring by new and more promising varieties, so that in time this process of natural elimination should result in the establishment of the most hardy and best suited varieties for the district.

SMALL FRUITS

RED CURRANT.—The seven varieties which were set out in 1920 gave the following yields in pounds from six bushes: Red Grape, 43·6; Simcoe King, 32·2; London Red, 25·9; Victoria, 24·6; Long Bunch Holland, 22·8; Red Dutch, 18; and Red Cross, 17·8.

WHITE CURRANTS.—Two varieties were set out in 1920. White Grape gave 18 pounds and White Cherry 12 pounds from six bushes.

BLACK CURRANT.—Fourteen varieties are under test since 1920. The yields in pounds from six bushes are as follows: Climax, 43·3; Saunders, 42·2; Buddenborg, 41·8; Collins Prolific, 40; Topsy, 38·5; Magnus, 37·6; Eclipse, 34·8; Beauty, 34·6; Ontario, 34·3; Victoria, 32·8; Kerry, 32·4; Eagle, 27·5; Clipper, 17·4; and Lee Prolific, 14·9.

RASPBERRIES.—Eight varieties have been under test since 1920. The results in pounds in 1928 per 30-foot row are as follows: Herbert, 24·6; Cuthbert, 15·9; Newman No. 23, 14; Early June, 12·4; Brighton, 11·8; St. Regis, 9·4; King, 8·9; and Sunbeam, 7·1.

AUTUMN VERSUS SPRING PLANTING OF RASPBERRIES.—The object of this experiment is to compare the results from raspberries when planted in the autumn and in the spring. Nine varieties were used. The autumn lot were planted in October, 1925, and the spring lot in May, 1926. Both plantings have given a full stand and some fruit was borne in 1927. The results in 1928 are as follows:—

AUTUMN VERSUS SPRING PLANTING OF RASPBERRIES—RESULTS IN 1928

Varieties	Yield per 50-foot row			
	Fall planting		Spring planting	
	lb.	oz.	lb.	oz.
Brighton	21	13	10	7
Herbert	18	14	16	5
Early June	15	13	11	7
Newman, 23	11	0	11	10
King	10	8	13	12
St. Regis	7	12	6	2
Sunbeam	6	9	5	9
Viking	6	2	3	7
Count	4	5	4	14
Average	11	7	9	5

VEGETABLES

SUMMARY OF VARIETY TESTS IN 1928

Vegetable	Number of varieties	Where sown	Date sown	Date planted in garden	Distance between rows	Distance between plants
					inch	inch
Bean	22	Garden	June 11		30	2
Broad Beans	3	Garden	May 17		36	6
Beet	17	Garden	May 17		18	2
Cabbage, Early	9	Hotbed	May 7	June 14	30	18
Cabbage, Late	7	Hotbed	May 7	June 14	30	24
Cauliflower	2	Hotbed	May 7	June 15	30	18
Celery	11	Greenhouse	April 16	June 29	48	6
Carrot	10	Garden	May 17		18	1½
Egg Plant	3	Greenhouse	April 16	June 27	18	12
Endive	1	Garden	May 17		18	6
Kohl Rabi	2	Garden	May 17		30	8
Kale or Borecole	2	Hotbed	May 7	June 15	30	24
Leek	2	Hotbed	May 7	June 27	18	6
Lettuce	13	Garden	May 17		18	6
Onion	14	Garden	May 18		18	1
Parsnip	4	Garden	May 18		30	2
Peas	8	Garden	May 18		36	1
Potato	2	Garden		June 2	30	15
Radish	11	Garden	May 16		18	
Spinach	4	Garden	May 16		18	6
Salsify	3	Garden	May 17		18	1½
Turnip	3	Garden	May 16		18	2
Tomato	18	Greenhouse	April 16	June 27	36	36

BEANS.—Twenty-two varieties were under test. The results in quarts per 30-foot row from the ten highest yielding varieties are as follows: Hidasta, 23·5; Plentiful French, 22·5; Stringless Green Pod, 22·5; Pencil Pod Black Wax, C.E.F., 21·3; Davis White Wax, 18·5; Pencil Pod Black Wax, Burpee, 18·5; No. 1, White Pole, 18·5; Round Pod Kidney Wax, C.E.F., 17; Hodson Long Pod, 17; and Round Pod Kidney Wax, McDonald, 16·8.

BROAD BEANS.—Three varieties were under test. The results in quarts per 30-foot row are as follows: Early Mazagan, 55·5; Long Pod Green, 54·5; and Masterpiece, 48·5.

BEETS.—Seventeen varieties were under test. The results in pounds per 30-foot row are as follows: Eclipse, Frith, 50·9; Crimson Globe, 43; Detroit Dark Red, C.E.F., 42·1; Eclipse, McD., 40; Flat Egyptian, 38·9; Detroit Dark Red, Moore, 38·5; Crosby Egyptian, D. & F., 38·3; Early Flat Egyptian, 38; New Oval Gem, 37·8; Early Wonder, 37·3; Cardinal Globe, 36·9; Crosby Egyptian, St. Briggs, 35·8; Detroit Dark Red, McD., 35·5; Detroit Dark Red, Graham, 33·5; Black Red Ball, Burpee, 30·4; Improved Dark Red, 29·6; and Black Red Ball, C.E.F., 22·4.

CABBAGE.—Sixteen varieties were under test. The results in pounds per 30-foot row are as follows: Extra Amager Danish Ballhead, 109·5; Enkhuizen Glory, 108·5; Perfection Drumhead, 106·5; Babyhead, 106; Etampes, 89·5; Copenhagen Market, 80; Empress Extra Early, 74; Golden Acre, 71·5; Dala, 71; Kildonan, 66·5; Early Paris Market, 64; Drumhead Savoy, 62·5; Early Jersey Wakefield, 59; Early Summer, 58·5; Marblehead Mammoth, 57; and Kinver Globe, 36.

CAULIFLOWER.—Two varieties were under test. Dwarf Erfurt gave 38·8 and Early Snowball 32·4 pounds per 30-foot row.

CELERY.—Eleven varieties were under test. The results in pounds per 30-foot row are as follows: Evans Triumph, 54; Giant Pascal, 53; Easy Blanching, 47·5; Winter Queen, 46; French Success, 46; Paris Golden, 39·5; White Plume, 37·5; Paris Golden Yellow, 37; Fordhook Emperor, 36·5; Golden Self Blanching, McD., 28; and Golden Self Blanching, C.E.F., 17·5.

CARROTS.—Ten varieties were under test. The results in pounds per 30-foot row are as follows: Garden Gem, 67·9; Improved Danvers, 67·6; Nantes, 67·6; Danvers Half Long, 62·1; Early Scarlet Horn, 60·9; Chantenay, 55·8; Oxheart, 51·5; Chantenay or Model, 51·1; Maux, 44; and Early Nantes, 40·6.

EGG PLANTS.—Three varieties were under test. Extra Early Dwarf gave 3·6; Black Nagasacki, 2·9; and Purple Earliest, 1·5 pounds per 30-foot row.

ENDIVE.—Only one variety, Fine Green Curled, was under test. A yield of 38·3 pounds per 30-foot row was obtained.

KOHL RABI.—Two varieties were under test. Purple Vienna gave 61; and White Vienna 49·5 pounds per 30-foot row.

KALE OR BORECOLE.—Two varieties were under test. Tall Green gave 61; and Dwarf Green Curled 49·5; pounds per 30-foot row.

LEEKS.—Two varieties were under test. Carentan gave 9·5; and Musselburgh 8·5, pounds per 30-foot row.

LETTUCE.—Thirteen varieties were under test. The average yield from the thirteen varieties was 46 pounds per 30-foot row.

All three types, head, cos and leaf, do well in this district, and give a product which is high in quality and crispness.

ONIONS.—Fourteen varieties were under test. The results in pounds per 30-foot row are as follows: Giant Prizetaker, 12; Southport Red Globe, 12; Yellow Globe Danvers, Graham, 11·5; White Spanish, 11; Yellow Globe Danvers, Steele Briggs, 10·5; Yellow Globe Danvers, C.E.F., 10·5; Large Yellow Prizetaker, 10; Southport White Globe, 10; Large Red Wethersfield, 10; Early Flat Red, 9·5; Ailsa Craig, 9·5; Australian Brown, 9·5; White Barletta, 9; and Southport Yellow Globe, 8·5.

Two varieties grown from sets were under test Yellow Globe Danvers gave 30·5; and Large Red Wethersfield, 20 pounds per 30-foot row.

PARSNIP.—Four varieties were under test. The results in pounds per 30-foot row are as follows: Hollow Crown, McKenzie, 64; Hollow Crown, C.E.F., 61; Guernsey XXX, 59·5; and Elcombe Improved Hollow Crown, 54.

GARDEN PEAS.—Eight varieties were under test. The results in quarts per 30-foot row are as follows: Gregory Surprise x English Wonder, 29·5; Stratagem, 26·5; Gradus x English Wonder, 24·5; Gregory Surprise x American Wonder, 24·5; Laxtonian, 22; Thomas Laxton, 22; American Wonder, 20·5; and McLean Advancer, 19·5.

POTATOES.—Two varieties were under test. The tubers were planted in quadruplicate one-eightieth-acre plots. The Irish Cobbler variety gave 201 bushels of marketable and 35 bushels and 20 pounds of unmarketable per acre, and the Green Mountain gave 228 bushels and 20 pounds of marketable and 30 bushels of unmarketable per acre.

RADISH.—Eleven varieties were under test. The results in pounds per 30-foot row are as follows: French Breakfast, Madsen, 44; XXX Scarlet Oval, 39·5; Saxa, 37·5; French Breakfast, Frith, 35; Sparkler or Perfection, 33·5; Scarlet Turnip White Tip, 33; French Breakfast, James, 30; Chartier, 30; French Breakfast, Patmore, 29·5; Non Plus Ultra, 24; and Icicle, 22.

SPINACH.—Four varieties were under test. Victoria gave 22, Broad Flanders, 19·5; Long Standing, 19; and Viroflay, 18·5 pounds per 30-foot row.

SALSIFY.—Three varieties were under test. Long Black gave 51·5; Long White, 34; and Mammoth Sandwich Island, 34 pounds per 30-foot row.

TURNIP.—Three varieties were under test. Red Top Strap Leaf gave 43·3; Early Purple Top Milan, 33; and Purple Milan, 29 pounds per 30-foot row.

TOMATOES.—Eighteen varieties were under test. The results are as follows:—

VARIETY TEST WITH TOMATOES, RESULTS IN 1928

Variety	Source	Date first ripe fruit	Yield per 30-foot row			
			Ripe		Green	
			lb.	oz.	lb.	oz.
Alacrity x Earlibell	C.E.F.	Sept. 11	0	7	57	8
Alacrity x Bonny Best	C.E.F.	Aug. 31	2	13	53	4
Avon Early	Dreer				52	12
Prosperity	Patmore				50	9
Early Mascot	Graham				50	4
Select Earliana	Moore				50	0
Herald	C.E.F.	Sept. 11	1	13	47	8
Alacrity	C.E.F.	Aug. 31	0	11	47	0
Chalk Early Jewel	Steele Briggs				46	0
John Baer	Moore				42	8
Bonny Best	Stokes				42	0
Avon Early	Ferry				40	0
Bonny Best	Moore				35	0
Pink No. 1	C.E.F.	Aug. 31	1	0	33	0
Pink No. 2	C.E.F.	Sept. 11	1	4	32	0
Bonny Best	Keith				26	13
L.G. and B.B	C.E.F.				21	0
Marglobe	Stokes				15	0

CULTURAL EXPERIMENTS

RATE OF PLANTING BEANS.—The object of this experiment is to compare the results from planting beans, 2, 4, and 6 inches apart in the row. Two varieties were used. The seed was planted on June 11, in rows 30 feet in length and 30 inches apart. The results are as follows:—

RESULTS OF DIFFERENT RATES OF PLANTING BEANS

Variety	Yield per thirty-foot row					
	1928			Five-year average		
	Two inches	Four inches	Six inches	Two inches	Four inches	Six inches
	quart	quart	quart	quart	quart	quart
Round Pod Kidney Wax	14·0	16·5	7·8	12·2	10·8	7·1
Stringless Green Pod	19·5	10·6	8·7	13·5	10·6	8·7

The figures in this table would seem to indicate that 2 inches is a very good distance for planting beans. It should also be mentioned that the best quality was obtained from the close planting.

PAPER POTS OR COLLARS WITH CAULIFLOWER.—The object of this experiment is to determine to what extent paper pots or collars will protect cauliflower plants from attack by insects. When the plants are being transplanted to the garden a paper pot about 3 inches in diameter is placed around each plant, while an equal number is planted in the usual way. Those protected gave a 97 per cent stand and a yield of 30 pounds 7 ounces, while those unprotected gave a 92 per cent stand and a yield of 25 pounds 2 ounces per 30-foot row.

RATE OF PLANTING PEAS.—The object of this experiment is to compare the results from planting peas, 1, 2, and 3 inches apart in the row. Three varieties were used. The seed was planted on May 18, in rows 30 feet in length and 30 inches apart. The results are as follows:—

RESULTS FROM DIFFERENT RATES OF PLANTING PEAS

Variety	Yield per thirty-foot row					
	1928			Four-year average		
	One inch	Two inches	Threeinches	One inch	Two inches	Threeinches
	quart	quart	quart	quart	quart	quart
English Wonder	18·3	15·8	14·0	15·5	13·3	12·5
Thomas Laxton	22·5	19·8	15·8	17·0	14·8	12·6
Stratagem	25·3	21·3	18·5	25·3	15·5	15·1

SPROUTING EXPERIMENT WITH POTATOES.—The object of this experiment is to compare the results from potatoes which are sprouted previous to planting by being exposed for six weeks to subdued light at a temperature of 40 to 50 degrees Fahrenheit, with those kept dormant in a cool, dark root-cellar. Two varieties were used. The tubers were planted in quadruplicate rows, 66 feet in length, 30 inches apart, and the sets were placed 1 foot apart in the row. In 1928 they were planted on May 30, and harvested on October 2. The results are as follows:—

RESULTS OF SPROUTING EXPERIMENT WITH POTATOES

Variety	How treated	Yield per acre							
		1928				Five-year average			
		Marketable		Unmarketable		Marketable		Unmarketable	
		bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.
Irish Cobbler	Sprouted	290	24	60	20	316	8	49	30
Irish Cobbler	Unsprouted	146	18	70	42	272	8	52	52
Green Mountain	Sprouted	216	42	67	6	372	28	46	5
Green Mountain	Unsprouted	174	54	78	6	341	0	51	55

The figures in this table indicate that sprouting the tubers previous to planting has quite a marked effect in increasing the yield. It may also be mentioned that the period from time of planting until date ready for use was reduced by about two weeks by this method.

SPRAYING EXPERIMENT WITH POTATOES.—The object of this experiment is to compare the results from sprayed and unsprayed potatoes, using Bordeaux mixture. In 1928 the first spraying occurred on July 16, and six sprayings were applied at intervals of seven days. The variety used was Irish Cobbler, which was planted on June 2, in quadruplicate one-eightieth-acre plots, and harvested on October 6. The results are as follows:—

RESULTS OF SPRAYING EXPERIMENT WITH POTATOES

Treatment	Yield per acre			
	1928		Five-year average	
	Marketable	Unmarketable	Marketable	Unmarketable
	bush. lb.	bush. lb.	bush. lb.	bush. lb.
Sprayed	215 40	26 40	222 32	27 13
Unsprayed	228 20	28 40	223 24	28 8

The figures in this table indicate that the application of Bordeaux mixture does not increase the yield of potatoes in this district. This may be attributed to the fact that late blight is rarely present.

DATE OF PLANTING POTATOES.—The object of this experiment is to compare the results from potatoes planted at different dates, at intervals of fourteen days, beginning as early as possible and continuing for five dates. Two varieties were used and the first date of planting in 1928 was on May 24. The tubers were planted in quadruplicate 66-foot rows, and the sets were placed 1 foot apart in the row. The results are as follows:—

RESULTS FROM DIFFERENT DATES OF PLANTING POTATOES

Variety	Date planted 1928	Date ready for use 1928	Yield per acre			
			1928		Five-year average	
			Marketable	Unmarketable	Marketable	Unmarketable
			bush. lb.	bush. lb.	bush. lb.	bush. lb.
Irish Cobbler	May 24	Aug. 16	196 54	38 30	275 26	46 52
Irish Cobbler	June 7	Sept. 1	173 48	47 18	254 19	53 1
Irish Cobbler	June 21	Sept. 15	140 48	60 30	214 30	60 43
Irish Cobbler	July 5	Sept. 15	74 48	60 30	166 46	56 19
Irish Cobbler	July 19	Oct. 3	22 00	47 18	87 47	48 50
Green Mountain	May 24	Aug. 24	198 00	53 54	280 17	56 59
Green Mountain	June 7	Sept. 4	161 42	56 6	278 44	54 7
Green Mountain	June 21	Sept. 15	145 12	55 00	213 17	64 54
Green Mountain	July 5	Sept. 15	56 6	53 54	163 41	65 34
Green Mountain	July 19	Oct. 3	3 18	70 24	60 56	55 13

The figures in this table indicate in a very vivid manner the importance of early planting if the best results are to be obtained.

FALL VERSUS SPRING SEEDING OF VEGETABLES.—The object of this experiment is to compare the results in earliness and yield from vegetables when the seed is sown just before the ground freezes in the fall and when sown in the spring in the regular way. Seven kinds of vegetables were used in this test. The seed was sown on October 29, 1927, and on May 14, 1928. The results are as follows:—

RESULTS OF FALL VERSUS SPRING SEEDING OF VEGETABLES

Crop	Variety	Date ready for use 1928		Yield per thirty-foot row					
				1928				Five-year average	
		Fall seeding	Spring seeding	Fall seeding		Spring seeding		Fall seeding	Spring seeding
				lb.	oz.	lb.	oz.	lb. oz.	lb. oz.
Beet	Detroit Dark Red	Aug. 18	Aug. 24	25	0	47	8	9 0	28 12
Carrot	Chantenay Copenhagen	Aug. 16	Aug. 16	52	8	62	12	28 3	37 4
Cabbage	Market								7 14
Lettuce	Grand Rapids	July 29	Aug. 2	43	0	48	0	33 0	34 13
Onion	Red Wethersfield	July 20	Aug. 2	6	0	16	8	6 3	10 0
Radish	Scarlet White Tip	June 26	June 26	8	8	37	12	7 8	33 15
Turnip	Purple Milan	July 20	July 25	12	8	41	6	4 8	37 13

It is interesting to note that all of these vegetables except cabbage can be produced from fall seeding. However, in no case was the yield as large as when sown in the spring in the ordinary way. In a few cases the date ready for use was advanced a few days but it is doubtful if the difference in this factor is sufficient to offset the reduction in yield.

PRUNING EXPERIMENT WITH TOMATOES.—The object of this experiment is to compare the results in yield, quality and maturity of fruit produced from various methods of pruning tomato plants to a single stem. Two varieties were used. The seed was sown in the greenhouse on April 16, and the plants set out in the garden on July 3, in rows 2 feet apart, and the plants 1 foot apart in the row. The results are as follows:—

RESULTS OF PRUNING EXPERIMENT WITH TOMATOES

Variety	Method of pruning to single stem	First ripe fruit	Yield from 25 plants			
			Ripe		Green	
			lb.	oz.	lb.	oz.
Bonny Best	Not headed back	Aug. 17	12	0	89	0
Bonny Best	Stopped at third truss of fruit	Aug. 17	16	4	46	0
Bonny Best	Stopped at second truss of fruit	Aug. 25	17	11	18	0
Bonny Best	Stopped at first truss of fruit	Aug. 25	12	2	13	0
Alacrity	Not headed back	Aug. 17	16	15	61	0
Alacrity	Stopped at third truss of fruit	Aug. 17	13	13	32	0
Alacrity	Stopped at second truss of fruit	Aug. 17	19	10	20	0
Alacrity	Stopped at first truss of fruit	Aug. 17	19	1	10	0

NITRATE OF SODA FOR VEGETABLES.—The object of this experiment is to compare the results from vegetables which are treated with nitrate of soda versus those which received only the usual application of manure. The nitrate was applied on one-half of each row at the rate of 300 pounds per acre divided into three applications of 100 pounds each. The first application was given on June 29, and the other two at intervals of 10 days. The results are as follows:—

RESULTS WITH NITRATE OF SODA FOR VEGETABLES

Vegetables	Yield per 30-foot row							
	1928				Two-year average			
	Nitrate		No nitrate		Nitrate		No nitrate	
	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.
Beet	37	13	37	0	42	1	39	10
Cabbage	78	3	77	9	75	14	64	5
Carrot	57	13	56	0	70	11	62	4
Cauliflower	41	4	30	2	39	6	27	3
Kohl Rabi	61	0	52	0	50	0	42	8
Lettuce	48	11	43	2	46	10	43	13
Onion Sets	28	0	23	0	32	8	25	2
Parsnip	62	0	56	4	75	6	59	8
Salsify	44	11	35	0	53	8	44	3
Garden turnip	36	3	34	0	40	2	38	1

FLOWERS

The season of 1928 was fairly good for the production of annual flowers. The bloom was profuse and continued from early summer until late autumn.

Sixty-two distinct types or kinds of annual flowers were under test. Several of these were represented by many varieties and colours. Thirty-four were sown in the greenhouse on April 17 and 18. These were transplanted to the borders on June 25 and 26.

Among those which are started in the greenhouse and have been found to give the best results over a period of years are the following: Aster, Chrysanthemum (Bridal Robe), Cosmos, Gaillardia, Helichrysum, Marigold, Nicotiana, Phlox Drummondii, Stock, Salpiglossis, Tagetes, Verbena, and Zinnia.

Twenty-eight sorts were sown direct in the open on June 5 and 6, with the exception of the Sweet Peas which were seeded on May 30. Among the best of those tried for growing in this manner are the following: Alyssum, Browallia, Calendula, Candytuft, Cornflower, Clarkia, Eschscholtzia, Gypsophila, Larkspur, Lavatera, Virginian Stock, Linaria, Mignonette, Nasturtium, Poppy, Sunflower, Sweet Sultan, and Sweet Peas.

Bulbs have been used quite extensively as a means of getting magnificent bloom in the very early spring. Each autumn a number of the best varieties of Hyacinths, Tulips, Narcissus and Crocus are planted and the majority of these have been proving hardy and giving excellent results.

PERENNIAL FLOWERS

The following perennials are proving hardy: Anemone, Aquilegia, Campanula, Chrysanthemum, Coreopsis, Delphinium, Dianthus, Papaver, Paeonia, Platycodon, Rudbeckia, Spiraea, and Iris.

TREES AND SHRUBS

The past season has been quite favourable to the growth and development of trees and shrubs.

The laurel-leaved willow and Russian poplar have proved to be rapid growers and the former may be used either for individual trees or hedge purposes. The Caragana is also one of the best sorts tried as a deciduous hedge. White Spruce is also proving very excellent as a permanent evergreen hedge.

Some of the more hardy ornamental shrubs are, the lilac, Caragana, Japanese rose, Japanese barberry, Golden currant, Tartarian honeysuckle, Viburnam lantana and Mountain ash.

CEREALS

SPRING WHEAT

Five varieties were under test. The seed was sown on May 18, in quadruplicate, one-fortieth-acre plots, at the rate of 2 bushels per acre, with the exception of Reward which was in triplicate plots only. The results are as follows:—

VARIETY TEST WITH SPRING WHEAT

Variety	Date of ripening	Number of days maturing	Average length of straw including head	Strength of straw on scale of ten points	Actual yield of grain per acre	Number of days maturing 9-year average 1920-28	Yield of grain per acre 9-year average 1920-28
			in.		bush. lb.		bush. lb.
Reward, Ottawa 928	Sept. 6	111	38	10·0	31 20	.....	.....
Marquis, Ottawa 15	" 20	125	37	9·0	28 40	120	26 49
Huron, Ottawa 3	" 22	127	38	9·0	25 50	121	28 19
Garnet, Ottawa 652	" 6	111	35	9·8	25 30	.....	.....
Ruby, Ottawa 623	" 5	110	36	9·8	24 20	110	21 15

It is worthy of note that the Reward, Garnet and Ruby varieties are at least ten days earlier than either the Marquis or Huron. This should prove to be a strong point in their favour, particularly for sections of the country where the growing season is of short duration.

OATS

Seven varieties were under test. The seed was sown on May 18, in quadruplicate one-fortieth-acre plots, at the rate of 2½ bushels per acre. The results are as follows:—

VARIETY TEST WITH OATS

Variety	Date of ripening	Number of days maturing	Average length of straw including head	Strength of straw on scale of ten points	Actual yield of grain per acre	Number of days maturing 7-year average	Yield of grain per acre 7-year average 1922-28
			in.		bush. lb.		bush. lb.
Gold Rain	Sept. 16	121	44	8·3	70 20	120	61 26
Victory	" 22	127	46	8·0	69 24	123	63 25
O.A.C. No. 72	" 22	127	46	9·0	66 26	.....	.....
Banner, Ottawa 49	" 22	127	48	7·9	61 26	124	60 1
Liberty, Ottawa 480	" 5	110	42	7·5	53 28	114	40 21
Laurel, Ottawa 477	" 5	110	40	9·5	52 22	.....	.....
Alaska	" 1	106	43	8·5	52 22	112	52 26

It may be noted that over a seven-year period the Alaska variety is 12 days earlier than the Banner and the yield is only a little over 7 bushels less. The Gold Rain is ahead this year, but the characteristic yellowish colour prevents this variety from becoming popular. Liberty and Laurel are both hulless varieties.

BARLEY

Seven varieties were under test. The seed was sown on May 18, in quadruplicate one-fortieth-acre plots at the rate of 2 bushels per acre. The results are as follows:—

VARIETY TEST WITH BARLEY

Variety	Date of ripening	Number of days maturing	Average length of straw including head	Strength of straw on scale of ten points	Actual yield of grain per acre	Number of days maturing 8-year average 1921-28	Yield of grain per acre 8-year average 1921-28
			in.		bush. lb.		bush. lb.
Gold	Sept. 20	125	38	4·0	49 38	.....	.....
Himalayan, Ottawa 59	Aug. 23	97	30	8·5	48 46	107	34 36
O.A.C. No. 21	Sept. 10	115	41	8·0	42 44	111	41 24
Duckbill, Ottawa 57	" 20	125	43	9·0	42 24	119	40 30
Charlottetown 80	" 20	125	41	5·0	41 2	.....	.....
Chinese, Ottawa 60	" 15	120	46	7·4	40 40	.....	.....
Manchurian, Ottawa 50	" 17	122	48	8·0	35 20	113	39 33

The Gold barley which is ahead this year is a two-rowed variety, as are also the Duckbill and Charlottetown 80 varieties. The Himalayan is a six-rowed hulless variety. O.A.C. No. 21 is ahead in the eight-year average and is a standard six-rowed variety with fairly early maturity, and good quality.

FIELD PEAS

Five varieties were under test. The seed was sown on May 21, in quadruplicate one-fortieth-acre plots. The average rate of seeding was 3 bushels per acre. The results are as follows:—

VARIETY TEST WITH FIELD PEAS

Variety	Date of ripening	Number of days maturing	Average length of plant	Actual yield of grain per acre		Number of days maturing 5-year average 1924-28	Yield of grain per acre 5-year average 1924-28	
			in.	bush.	lb.		bush.	lb.
Arthur, Ottawa 18	Sept. 19	121	49	48	40	130	37	36
Mackay, Ottawa 25	" 23	125	64	43	30	137	33	18
Chancellor, Ottawa 26	" 6	108	48	35	50	125	34	36
Golden Vine	" 9	111	58	35	40	125	34	40
Early Raymond	" 9	111	54	29	10	.....	.....	

Early maturity is one of the big factors in the successful growing of peas in this district, and the Chancellor, Golden Vine and Early Raymond are about equal in this regard, although the Chancellor, being a small pea, appears to harden up just a little better than any of the others tried.

COMMON VETCH

One variety of vetch, namely, common vetch, was sown on May 21, in quadruplicate one-fortieth-acre plots, at the rate of 1½ bushels per acre. An average yield of 22 bushels and 8 pounds to the acre was obtained, but the grain was not sufficiently matured to be suitable for seed.

SPRING RYE

One variety, namely, common spring rye, was under test. The seed was sown on May 21, in quadruplicate one-fortieth-acre plots at the rate of 1½ bushels per acre. It matured in 122 days and gave a yield of 29 bushels and 26 pounds per acre. Over a seven-year period the average yield is 26 bushels and 3 pounds, and the number of days to mature 122.

ROD-ROW PLOTS

In 1928, twenty-six varieties and strains of spring wheat, thirty-seven of oats and thirty-five of barley were under test by this method. The seed germinated well and a fairly nice stand developed although some of the plots suffered from too much rain.

FORAGE CROPS

ENSILAGE CROPS

VARIETY TEST WITH SUNFLOWERS

Five varieties were under test. The seed was sown on May 25, in quadruplicate one-fortieth-acre plots, on fall-ploughed sod which was manured at

the rate of 16 tons per acre previous to ploughing. The rows were 30 inches apart, and the plants were thinned to from 6 to 12 inches apart in the row. Germination was good and a nice even stand developed. They were harvested on September 14. The results are as follows:—

RESULTS OF VARIETY TEST WITH SUNFLOWERS

Variety	Source of seed	Average height, 1928	Per cent in bloom when cut, 1928	Yield per acre							
				1928				Average 1924-28			
				Green weight		Dry weight		Green weight		Dry weight	
		in.		tons	lb.	tons	lb.	tons	lb.	tons	lb.
Mam. Russian	D.I.S. Co	83	0	20	830	2	1,336	15	322	1	1,894
Mam. Russian	McDonald	79	1	19	1,580	2	654	14	1,986	1	1,739
Manchurian	McKenzie	79	28	14	1,920	2	329	11	565	1	1,257
Mennonite	Rosthern	64	100	13	300	1	1,959	.....		.....	
Early Ottawa 76	C.E.F	74	61	15	1,080	1	1,854	11	1,395	1	1,117

Mammoth Russian is the variety used in the field crop areas on this Station.

VARIETY TEST WITH CORN

Twenty-four varieties were under test. The seed was planted on May 30, in quadruplicate one-eightieth-acre plots on fall-ploughed clay land which was manured at the rate of 16 tons per acre previous to ploughing. The corn was put in hills 30 inches apart each way with 4 to 6 kernels to the hill. The seed germinated fairly well and a good stand developed. In fact, the yield was one of the most promising to date for this crop from the standpoint of silage production. The plots were not harvested until September 17, and even at this late date had not been seriously injured by frost. The average yield per acre of green material from the twenty-four varieties is 8 tons 1,164 pounds, and of dry material 1,726 pounds. The ten highest-yielding varieties gave an average yield of 9 tons 1,822 pounds of green material and 1 ton 41 pounds of dry material. Their names and source of seed in order of yield of dry material are as follows: Northwestern Dent, Brandon; North Dakota, Steele Briggs; Northwestern Dent, Crookston Strain, McKenzie; Burr Leaming, Carter; Leaming, Duke; Longfellow, Duke; Hybrid, Wimple; Wisconsin No. 7, Duke; Twitchell's Pride, Fredericton; and Northwestern Dent, Dakota Improved Seed Company.

ANNUAL HAYS

OATS AS AN ANNUAL HAY

The objects of this experiment are (1) to determine the suitability and productiveness of oats when used as hay, and (2) to ascertain the most suitable varieties and the best stage of maturity for harvesting.

In 1928 thirteen varieties were under test. The seed was sown on May 21 in quadruplicate one-fortieth-acre plots on fall-ploughed sod which was manured at the rate of 16 tons per acre previous to disking. The rate of seeding was 2½ bushels per acre. Germination was good and fairly good yields were obtained.

One-third of each plot was harvested when in bloom, one-third when turning, and one-third when nearly ripe. The results are as follows:—

VARIETY TEST WITH OATS FOR ANNUAL HAY. AVERAGE YIELD FOR THE THREE STAGES OF MATURITY

Variety	Yield per acre			
	1928		Average for 1924-28	
	Dry weight	Cured hay containing 15% moisture	Dry weight	Cured hay containing 15% moisture
	tons lb.	tons lb.	tons lb.	tons lb.
Late varieties—				
20th Century	1 1,656	2 301	2 221	2 966
Abundance	1 1,434	2 40	2 553	2 1,356
Gold Rain	1 1,382	1 1,979	2 77	2 796
Victory	1 1,284	1 1,864	2 488	2 1,280
Ligowa	1 1,109	1 1,658	2 80	2 800
Sensation	1 758	1 1,245	1 1,889	2 575
Leader	1 732	1 1,214	2 181	2 919
O.A.C. No. 72	1 582	1 1,038	2 145	2 876
Banner	1 416	1 842	2 71	2 789
Early varieties—				
Liberty	1 780	1 1,271	1 1,459	2 69
Alaska	1 498	1 939	1 1,458	2 68
O.A.C. No. 3	1 347	1 761	1 1,537	2 161
Daubeney	1 272	1 673	1 1,328	1 1,915

It may be noted that the late varieties have all given fairly uniform yields, and that those are somewhat greater than those obtained from early varieties. The yield is also quite uniform among the early varieties. From the standpoint of quality the early varieties are superior to the others, on account of being finer in the straw. When well cured, oat hay makes a very satisfactory feed and is relished by nearly all kinds of live stock, particularly cattle.

In order to make possible a direct comparison between the different stages of maturity, the following table has been prepared:—

AVERAGE YIELD OF ALL VARIETIES OF OATS AT DIFFERENT STAGES OF MATURITY

Stage of maturity	Yield per acre			
	1928		Average 1924-28	
	Dry weight	Cured hay containing 15% moisture	Dry weight	Cured hay containing 15% moisture
	tons lb.	tons lb.	tons lb.	tons lb.
When in bloom	1 843	1 1,345	1 1,761	2 425
When turning	1 1,163	1 1,721	2 217	2 961
When nearly ripe	1 590	1 1,047	1 1,904	2 593

For best results it would appear that when oats are going to be used as a hay-crop they should be cut when from 10 to 20 per cent have turned, as the greatest weight of dry matter is obtained at this stage and the palatability is also particularly good.

PEAS AS ANNUAL HAY

Four varieties were under test. The seed was sown on May 22, in quadruplicate one-fortieth-acre plots on fall-ploughed clay-loam soil which was manured at the rate of 16 tons per acre previous to disking. The average rate of seeding was 3 bushels per acre. The plots were harvested on September 12. The results are as follows:—

VARIETY TEST WITH PEAS AS ANNUAL HAY

Variety	Yield per acre			
	1928		Average 1924-28	
	Dry weight	Cured hay containing 15% moisture	Dry weight	Cured hay containing 15% moisture
	tons lb.	tons lb.	tons lb.	tons lb.
Golden Vine	2 1,778	3 798	2 543	2 1,345
Mackay	2 1,010	2 1,894	.....	.....
Canadian Beauty	2 645	2 1,465	2 552	2 1,355
Arthur	2 477	2 1,267	2 563	2 1,368

The figures in this table show that peas give very good yields when grown as annual hay, but they seem to lack palatability when grown and fed alone, consequently, they should be sown largely in a mixture with oats or oats and vetch, as in this way they improve both the yield and quality of the crop owing to their rank growth and high protein content.

VETCH AS AN ANNUAL HAY

Common vetch was under test as an annual hay. The seed was sown on May 22, in quadruplicate one-fortieth-acre plots, on fall-ploughed clay-loam soil, which was manured at the rate of 16 tons per acre previous to disking. The rate of seeding was 1½ bushels per acre. The plots were harvested on September 12. The results are as follows:—

RESULTS WITH VETCH AS ANNUAL HAY

Variety	Yield per acre			
	1928		Average 1924-28	
	Dry weight	Cured hay containing 15% moisture	Dry weight	Cured hay containing 15% moisture
	tons lb.	tons lb.	tons lb.	tons lb.
Common	2 1,053	2 1,945	1 1,910	2 600

Vetch gives a very fair yield of dry matter. It is better, however, to be sown in a mixture with oats or oats and peas. Probably the most serious objection to this crop is the high cost of the seed, which does not mature very well in this district.

BIENNIAL VERSUS ANNUAL SWEET CLOVER

The object of this experiment is to compare the results from biennial sweet clover during the second year with annual sweet clover. The two biennial varieties were sown on June 2, 1927, in quadruplicate one-fortieth-acre plots, on fall-ploughed clay-loam soil which had been in potatoes the previous year. The

rate of seeding was 20 pounds per acre. The Hubam, which is the annual variety, was sown on May 31, 1928, in a similar manner. The biennial varieties were harvested on July 25, and the Hubam on September 5. The results are as follows:—

RESULTS WITH BIENNIAL VERSUS ANNUAL SWEET CLOVER

Variety	Average height 1928	Yield per acre			
		1928		Average 1924-28	
		Dry weight	Cured hay containing 15% moisture	Dry weight	Cured hay containing 15% moisture
	inch	tons lb.	tons lb.	tons lb.	tons lb.
Biennial—					
White Blossom	61	2 1,121	3 25	2 851	2 1,707
Yellow Blossom	48	2 188	2 927	2 218	2 962
Annual—					
Hubam	40	1 363	1 780	1 1,208	1 1,774

Both the White and Yellow Blossom varieties have given larger yields in the second year than has the Hubam in the first year.

FIELD ROOTS

The field roots were all seeded in quadruplicate one-eightieth-acre plots, on fall-ploughed sod which was manured at the rate of 16 tons per acre previous to ploughing.

MANGELS

Thirty-three varieties were under test. The seed was sown on May 25, and the plants were thinned to 8 inches apart in the row. However, there were practically no plots on which a full stand was obtained. The plots were harvested on October 2, 3 and 4. The results are as follows:—

VARIETY TEST WITH MANGELS

Variety	Source of seed	Per cent true to type 1928	Yield per acre			
			1928		Average 1925-28	
			Green weight	Dry weight	Green weight	Dry weight
			tons lb.	tons lb.	tons lb.	tons lb.
Yellow Leviathan	Bruce	95	9 1,420	1 196	9 500	1 221
Giant Rose	Bruce	95	7 1,080	— 1,970	.....	.....
White Green Top Half Sugar	Hartmann	96	7 40	— 1,696	9 810	1 410
Sludstrup Barres	Hartmann	95	6 1,520	— 1,662	.....	.....
Gate Post	Bruce	95	6 320	— 1,659	.....	.....
New Ideal	Steele Briggs	98	7 400	— 1,655	8 1,925	1 113
Fjerritslev Barres	Hartmann	80	7 800	— 1,629	9 1,785	1 372
Giant White Feeding	Bruce	88	7 1,080	— 1,621	10 215	1 461
Stryno Barres	Hartmann	95	7 520	— 1,608	10 880	1 525
Yellow Leviathan	Steele Briggs	98	7 1,260	— 1,562	9 1,295	1 463
Royal Giant Sugar Beet	Steele Briggs	98	6 1,540	— 1,510	.....	.....
Giant White Feeding Sugar	Steele Briggs	90	6 140	— 1,481	9 1,500	1 403
Yellow Intermediate	C.E.F.	95	5 1,260	— 1,469	.....	.....
Giant Yellow Intermediate	Steele Briggs	90	6 940	— 1,446	8 1,995	1 286
Eckendorfer Yellow	Hartmann	98	7 340	— 1,432	10 325	1 303
Eckendorfer Red	Hartmann	98	6 800	— 1,394	9 1,080	1 100

VARIETY TEST WITH MANGELS—*Concluded*

Variety	Source of seed	Per cent true to type 1928	Yield per acre			
			1928		Average 1925–28	
			Green weight	Dry weight	Green weight	Dry weight
			tons lb.	tons lb.	tons lb.	tons lb.
Prize Mammoth Long Red.	Steele Briggs...	90	6 120	— 1,387	.....	.....
Red Globe.....	Bruce.....	95	5 920	— 1,387	7 1,660	1,896
Yellow Globe.....	Bruce.....	90	5 80	— 1,381	8 1,125	1 59
Barres Half Long.....	G. Swedish.....	90	5 1,240	— 1,377	8 1,845	1 353
Svalof Original Rubra.....	G. Swedish.....	95	4 1,640	— 1,360	.....	.....
White Red Top Half Sugar.	Hartmann.....	80	6 240	— 1,325	8 1,335	1 237
Danish Sludstrup.....	D. & F.....	95	6 280	— 1,302	8 1,895	1 80
Rosted Barres.....	Hartmann.....	90	6 300	— 1,258	12 765	1 1,056
Golden Tankard.....	Bruce.....	90	5 320	— 1,184	7 1,160	0 1,952
Elvetham Mammoth.....	Hartman.....	95	4 1,340	— 1,137	8 1,635	1 454
Red Globe.....	Ewing.....	98	4 200	— 990	7 1,930	1 59
Danish Sludstrup.....	McDonald.....	95	4 200	— 974	8 1,225	1 134
Yellow Eckendorfer.....	G. Swedish.....	98	3 1,700	— 856	9 1,735	1 164
Barres Oval.....	G. Swedish.....	98	3 260	— 850	9 1,545	1 391
Eclipse.....	McKenzie.....	100	3 1,560	— 820	.....	.....
Red Eckendorfer.....	G. Swedish.....	95	3 260	— 719	8 1,190	0 1,965
Giant Yellow Globe.....	Steele Briggs...	93	3 1,080	— 708	8 1,065	0 1,925

DATE OF SEEDING MANGELS

The object of this experiment is to compare the results from different dates of seeding. The variety used was Yellow Intermediate. The seed was sown at intervals of seven days, commencing May 23. The roots were harvested on October 1. The results are as follows:—

RESULTS FROM DIFFERENT DATES OF SEEDING MANGELS

Date of seeding	Yield per acre			
	1928		Average 1927-28	
	Green weight	Dry weight	Green weight	Dry weight
	tons lb.	tons lb.	tons lb.	tons lb.
May 23.....	11 1,940	1 910	14 0	1 1,298
May 30.....	8 1,840	1 395	12 640	1 1,218
June 6.....	6 1,820	0 1,712	9 1,010	1 242
June 13.....	4 160	0 1,122	7 270	0 1,804
June 20.....	2 1,300	0 746	4 1,820	0 1,194
June 27.....	1 980	0 448	2 810	0 604

Early seeding appears to be an important factor influencing the yield of mangels.

SWEDE TURNIPS

Thirty varieties were under test. The seed was sown on May 25, and the plants were thinned to 12 inches apart in the row, although this year there were very few of the plots on which there was an entirely full stand. The plots were harvested on September 26 and 27. The results are as follows:—

VARIETY TEST WITH SWEDE TURNIPS

Variety	Source of seed	Yield per acre							
		1928				Average 1924-28			
		Green weight		Dry weight		Green weight		Dry weight	
		tons	lb.	tons	lb.	tons	lb.	tons	lb.
Olsgaard Bangholm	Hartmann	17	60	1	1,570	.....		.....	
Bangholm	Kentville	13	1,480	1	1,155	.....		.....	
Jumbo	Steele Briggs	15	120	1	965	11	1,248	1	68
Selected Purple Top	Steele Briggs	14	1,640	1	949	13	816	1	450
Bangholm	G. Swedish	12	1,320	1	917	12	1,752	1	383
Improved Yellow	G. Swedish	13	1,020	1	797	14	388	1	522
Bangholm	Nappan	11	860	1	776	.....		.....	
Hazards Improved	Steele Briggs	14	680	1	725	10	644	0	1,861
Shepherd	Trifolium	13	160	1	700	.....		.....	
Bangholm Sludsgaard	Trifolium	11	400	1	625	.....		.....	
Canadian Gem	Steele Briggs	12	1,840	1	608	.....		.....	
Hall's Westbury	Bruce	12	1,180	1	472	.....		.....	
Bangholm	Ewing	11	880	1	366	10	1,908	1	35
Halewoods Bronze Top	Steele Briggs	11	0	1	336	.....		.....	
Hartley's Bronze Top	Bruce	9	1,660	1	316	9	1,332	0	1,955
Canadian Gem	Bruce	12	20	1	245	10	1,928	0	1,977
Derby Green Top	Bruce	12	20	1	233	10	1,400	0	1,997
Good Luck	Steele Briggs	11	1,860	1	221	10	1,248	0	1,910
Kangaroo	Bruce	11	1,740	1	116	10	648	0	1,776
Swede Cornings	Yarmouth	11	160	1	109	.....		.....	
Elephant or Monarch	Ewing	11	40	1	104	.....		.....	
Bangholm Klank	Trifolium	10	40	1	102	.....		.....	
Kangaroo	Steele Briggs	11	160	1	80	10	1,480	0	1,991
Ditmars	McNutt	11	800	1	68	12	1,780	1	81
New Perfect	Bruce	9	1,500	0	1,957	11	540	0	1,992
Elephant or Monarch	Bruce	8	1,600	0	1,955	.....		.....	
Purple Top	C.E.F.	11	940	0	1,936	.....		.....	
White	Bruce	10	1,580	0	1,835	11	952	1	183
Magnum Bonum	Bruce	9	1,900	0	1,775	11	184	1	28
Hartley's Bronze Top	Graham	8	720	0	1,638	.....		.....	

DATE OF SEEDING SWEDE TURNIPS

The object of this experiment is to compare the results from different dates of seeding. Bangholm was the variety used. The seed was sown at intervals of seven days commencing on May 23. The roots were harvested on September 27. The results are as follows:—

RESULTS FROM DIFFERENT DATES OF SEEDING SWEDE TURNIPS

Date of seeding	Yield per acre							
	1928				Average 1927-28			
	Green weight		Dry weight		Green weight		Dry weight	
	tons	lb.	tons	lb.	tons	lb.	tons	lb.
May 23	15	460	1	945	10	530	1	130
May 30	12	500	1	391	9	1,650	1	66
June 6	8	240	0	1,645	7	430	0	1,616
June 13	5	1,540	0	1,220	4	1,590	0	1,103
June 20	5	1,860	0	1,352	3	810	0	790
June 27	2	1,640	0	560	2	70	0	464

Early seeding appears to be an important factor in obtaining the maximum yield of Swede Turnips.

FALL TURNIPS

Fourteen varieties were under test. The seed was sown on May 24, and the plants were thinned to 12 inches apart in the row. Very few of the plots, however, contained a full stand. They were harvested on September 22. The results are as follows:—

VARIETY TEST WITH FALL TURNIPS

Variety	Source of seed	Yield per acre							
		1928				Average 1924-28			
		Green weight		Dry weight		Green weight		Dry weight	
		tons	lb.	tons	lb.	tons	lb.	tons	lb.
Fynsk Bortfelder	D.L.F	20	560	1	677	.....		.....	
Purple Top Aberdeen	Sutton	18	1,180	1	659	.....		.....	
Purple Top Mammoth	Sutton	18	440	1	575	18	1,092	1	256
Hardy Green Round	Sutton	15	1,020	1	377	16	1,583	1	236
Yellow Tankard	D.L.F	19	1,320	1	284	.....		.....	
Dales	D.L.F	15	340	1	153	.....		.....	
Early Six Weeks	Sutton	16	840	1	56	17	1,111	1	1
Devonshire Greystone	Steele Briggs	15	1,380	1	16	18	1,032	1	256
Red Paragon	Sutton	17	140	0	1,965	18	272	1	279
Purple Top Mammoth	Steele Briggs	15	1,000	0	1,958	17	172	1	104
White Globe	Ewing	13	420	0	1,901	16	1,196	1	141
Aberdeen Purple Top	Steele Briggs	11	1,140	0	1,735	15	1,396	1	277
Green Top Yellow Aberdeen	Ewing	10	1,060	0	1,712	13	1,100	1	86
Pomeranian White Globe	Steele Briggs	12	1,980	0	1,605	16	693	1	271

Fall turnips are more rapid growers but are not as good keepers as are the swedes.

DATE OF SEEDING FALL TURNIPS

The object of this experiment is to ascertain what date or dates of seeding will give the largest yields and be the most satisfactory generally. Hardy Green Round was the variety used. The seed was sown at intervals of seven days, commencing on May 23. The roots were harvested on September 22. The results are as follows:—

RESULTS FROM DIFFERENT DATES OF SEEDING FALL TURNIPS

Date of seeding	Yield per acre							
	1928				Average 1924-28			
	Green weight		Dry weight		Green weight		Dry weight	
	tons	lb.	tons	lb.	tons	lb.	tons	lb.
May 23	22	80	1	1,239	20	1,920	1	856
May 30	22	200	1	1,241	18	1,320	1	533
June 6	21	1,820	1	992	15	856	1	201
June 13	16	520	1	422	11	880	0	1,602
June 20	15	1,440	1	270	10	320	0	1,389
June 27	10	1,200	0	1,622	6	788	0	898

It may be noted that on the average even fall turnips which are quite rapid growers give the best results when sown reasonably early.

FIELD CARROTS

Sixteen varieties were under test. The seed was sown on May 30, and the plants were thinned to about 4 inches apart in the row. They were harvested on September 28 and 29. The results are as follows:—

VARIETY TEST WITH FIELD CARROTS

Variety	Source of seed	Yield per acre							
		1928				Average 1924-28			
		Green weight		Dry weight		Green weight		Dry weight	
		tons	lb.	tons	lb.	tons	lb.	tons	lb.
Improved Short White	Steele Briggs	5	220		925	6	132		1,109
White Intermediate	Summerland	4	1,640		904				
White Belgian	Bruce	4	480		863	4	1,892		1,013
Danish Champion	C.E.F	3	1,940		807	4	804		960
Long Orange	Bruce	3	1,140		803	3	188		745
Large White Vosges	Bruce	4	20		788				
Large White Belgian	Steele Briggs	3	1,520		774	4	1,080		951
James	D.L.F	3	380		774				
White Belgian	D. & F	3	1,180		748	4	948		957
White Belgian	Hartmann	3	1,240		714	5	296		1,087
White Belgian	Trifolium	3	420		680	5	52		1,070
Long Orange Belgian	Bruce	2	1,940		666	3	1,596		894
Champion	Hartmann	3	860		658	3	1,760		840
Mam. White Intermediate	Bruce	3	820		655	5	788		1,069
Long Red Surrey	Steele Briggs	2	1,980		647				
Champion	G. Swedish	3	40		639				

DATE OF SEEDING FIELD CARROTS

The object of this experiment is to ascertain what date or dates of seeding will give the best results. Improved Short White was the variety used. The seed was sown at intervals of seven days commencing on May 23. The roots were harvested on September 28. The results are as follows:—

RESULTS FROM DIFFERENT DATES OF SEEDING FIELD CARROTS

Date of seeding	Yield per acre							
	1928				Average 1927-28			
	Green weight		Dry weight		Green weight		Dry weight	
	tons	lb.	tons	lb.	tons	lb.	tons	lb.
May 23	9	1,040		1,556	10	10		1,699
May 30	8	280		1,266	10	340		1,659
June 6	6	1,280		1,141	8	90		1,422
June 13	3	1,300		572	5	310		883
June 20	2	60		365	2	570		416
June 27	0	1,660		152	0	1,700		159

LEGUMES AND GRASSES

HAY PRODUCTION FROM GRASSES ALONE AND IN COMBINATION WITH CLOVERS

The objects of this experiment are to compare the results in yield and quality of hay produced from timothy, orchard grass, and meadow fescue grown alone, and in mixtures, and when these grasses are sown alone and in combination with red clover, alsike clover, and red and alsike clover.

In 1926 this experiment was seeded on May 29, in quadruplicate one-fortieth-acre plots, using barley as a nurse-crop. In 1927 it was again seeded on May 30, in a similar manner except that oats were used as the nurse-crop instead of barley. The results in 1928 from these two seedings and also the average results from the 1923-26 seedings are shown in the following table:—

RESULTS OF HAY PRODUCTION EXPERIMENT FROM GRASSES ALONE AND IN COMBINATION WITH CLOVERS

Seed sown per acre					Yield per acre							
					Second-year meadow, 1928				First-year meadow, 1928			
					Dry weight		Cured hay containing 15 per cent moisture		Dry weight		Cured hay containing 15 per cent moisture	
Red clover	Alsike clover	Timothy	Meadow fescue	Orchard grass	tons	lb.	tons	lb.	tons	lb.	tons	lb.
lb.	lb.	lb.	lb.	lb.								
10		8			1	1,978	2	680	2	1,051	2	1,942
10			15		1	1,775	2	441	2	1,112	3	14
10				15	1	1,054	1	1,593	2	131	2	860
10		6	10		1	1,812	2	485	2	851	2	1,707
10		6		10	1	1,824	2	499	2	914	2	1,781
10			10	10	1	1,727	2	385	2	276	2	1,031
	6	8			2	614	2	1,428	2	973	2	1,851
	6		15		1	1,418	2	21	2	459	2	1,246
	6			15	1	1,817	2	491	2	866	2	1,725
	6	6	10		1	1,995	2	700	2	560	2	1,365
	6	6		10	1	1,664	2	311	2	527	2	1,326
	6		10	10	1	1,800	2	471	2	189	2	928
8	2	8			2	80	2	800	2	758	2	1,598
8	2		15		1	1,696	2	348	2	429	2	1,211
8	2			15	1	1,483	2	98	2	623	2	1,439
8	2	6	10		1	1,925	2	618	2	642	2	1,461
8	2	6		10	2	85	2	806	2	630	2	1,447
8	2		10	10	2	111	2	836	2	188	2	927
		12			2	566	2	1,372	1	648	1	1,115
			30		1	1,531	2	154	1	306	1	713
				30	1	955	1	1,476	0	1,637	0	1,926
		8	15		1	1,443	2	51	1	176	1	560
		8		15	1	1,678	2	327	1	244	1	640
			15	15	1	1,520	2	141	1	89	1	458

Average first and second-year meadow, 1924–28		
Dry weight		Cured hay containing 15 per cent moisture
tons	lb.	tons lb.
1	1,425	2 29
1	1,102	1 1,649
1	667	1 1,138
1	1,135	1 1,688
1	995	1 1,524
1	729	1 1,211
1	1,379	1 1,975
1	803	1 1,298
1	665	1 1,135
1	1,087	1 1,632
1	823	1 1,321
1	711	1 1,189
1	1,155	1 1,712
1	952	1 1,473
1	665	1 1,135
1	1,140	1 1,694
1	1,246	1 1,819
1	1,128	1 1,680
1	1,118	1 1,668
1	288	1 692
0	1,814	1 134
1	406	1 831
1	400	1 824
1	331	1 742

In order to make possible a more direct comparison between the different sorts and mixtures under test, the following table has been prepared:—

AVERAGE OF THE DIFFERENT MIXTURES

Plots averaged	Average yield per acre from first and second-year meadow, 1924–28			
	Dry weight		Cured hay containing 15 per cent moisture	
	tons	lb.	tons	lb.
Where red clover is the base (6 plots)	1	1,009	1	1,540
Where alsike clover is the base (6 plots)	1	911	1	1,425
Where red and alsike mixed are the base (6 plots)	1	1,048	1	1,586
Where no clover is used (6 plots)	1	393	1	815
Where timothy is included (4 plots)	1	1,269	1	1,846
Where meadow fescue is included (4 plots)	1	786	1	1,278
Where orchard grass is included (4 plots)	1	453	1	886
Where timothy and meadow fescue are included (4 plots)	1	942	1	1,461
Where timothy and orchard grass are included (4 plots)	1	866	1	1,372
Where meadow fescue and orchard grass are included (4 plots)	1	725	1	1,206

The figures in these tables indicate that reasonably good yields may be obtained from any of the various mixtures under test. On the average, however, timothy appears to be quite superior to either meadow fescue or orchard grass, particularly the latter, both when grown alone and in the various mixtures. The mixtures containing both red and alsike clover have given the largest yields, followed by those containing red clover alone and alsike alone. The mixtures where no clover is used have given the lowest yields.

TIMOTHY AND CLOVERS FOR HAY PRODUCTION

The objects of this experiment are to compare the results in yield and quality of hay produced by seeding with various quantities of timothy, red clover, and alsike clover, and to ascertain to what extent red clover may be profitably replaced with alsike in the standard hay mixture.

In 1926 this experiment was seeded on May 29 in quadruplicate one-fortieth-acre plots, using barley as a nurse-crop. In 1927 it was seeded on June 4, in a similar manner except that oats were used instead of barley as the nurse-crop. The results in 1928 from these two seedings, and also the average results from 1923-26 seedings, are shown in the following table:—

TEST OF TIMOTHY AND CLOVERS FOR HAY PRODUCTION

Seed sown per acre			Yield per acre					
			Second-year meadow 1928		First-year meadow 1928		Average, first and second-year meadow, 1924–28	
Timothy	Red clover	Alsike clover	Dry weight	Cured hay containing 15 per cent moisture	Dry weight	Cured hay containing 15 per cent moisture	Dry weight	Cured hay containing 15 per cent moisture
lb.	lb.	lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.
8	10	.....	1 1,975	2 676	2 749	2 1,587	1 1,200	1 1,765
8	8	2	2 397	2 1,173	2 988	2 1,868	1 1,387	1 1,985
8	6	3	2 462	2 1,249	2 1,114	3 16	1 1,355	1 1,947
8	4	4	2 123	2 851	2 1,148	3 56	1 1,175	1 1,735
8	2	5	2 386	2 1,160	2 1,249	3 175	1 1,088	1 1,633
6	10	.....	2 102	2 826	2 1,016	2 1,901	1 1,162	1 1,720
6	8	2	2 242	2 991	2 1,023	2 1,909	1 1,348	1 1,939
6	6	3	2 34	2 746	2 858	2 1,715	1 1,154	1 1,711
6	4	4	1 1,977	2 679	2 1,399	3 352	1 1,050	1 1,588
6	2	5	2 224	2 969	2 926	2 1,795	1 1,129	1 1,681

The figures in this table would seem to indicate that timothy, red clover, and alsike clover may be each or all varied considerably in a hay mixture without materially affecting the yield obtained. It is worthy of note, however, that the yield has been increased by replacing 2 to 4 pounds of the red clover with the alsike.

LATE AND EARLY CLOVER WITH LATE AND EARLY GRASS

The object of this experiment is to compare the results in yield and quality of hay produced from a mixture of late and early clover and late and early grass.

This experiment was seeded in 1926 in quadruplicate one-fortieth-acre plots, using barley as a nurse-crop. In 1927 it was repeated in a similar manner using oats as the nurse-crop. The results to date are as follows:—

RESULTS FROM LATE AND EARLY CLOVER WITH LATE AND EARLY GRASS

Seed sown per acre				Yield per acre					
				Second-year meadow 1928		First-year meadow 1928		Average, first and second-year meadow, 1924–28	
Timothy	Meadow fescue	Early red clover	Late red clover	Dry weight	Cured hay containing 15 per cent moisture	Dry weight	Cured hay containing 15 per cent moisture	Dry weight	Cured hay containing 15 per cent moisture
lb.	lb.	lb.	lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.
8	.....	10	.....	2 725	2 1,559	2 30	2 741	1 1,388	1 1,986
.....	15	10	.....	1 1,951	2 648	2 108	2 833	1 1,162	1 1,720
8	.....	.....	10	2 677	2 1,502	2 732	2 1,567	1 1,456	2 66
.....	15	.....	10	2 249	2 999	2 1,144	3 52	1 1,083	1 1,627

Timothy has been giving somewhat better results than the meadow fescue, but there does not appear to be much difference in the yielding ability of the two clovers.

LATE VERSUS EARLY CLOVER IN STANDARD HAY MIXTURE

The object of this experiment is to compare the results in yield and quality of hay produced from using common red and late red clover in the standard hay mixture.

In 1926 this experiment was seeded in quadruplicate one-fortieth-acre plots using barley as a nurse-crop. In 1927 it was repeated in a similar manner using oats as the nurse-crop. The results to date are as follows:—

RESULTS WITH LATE VERSUS EARLY CLOVER IN STANDARD HAY MIXTURE

Seed sown per acre				Yield per acre					
				Second-year meadow 1928		First-year meadow 1928		Average, first and second-year meadow 1924–28	
Timothy	Alsike clover	Common red clover	Late red clover	Dry weight	Cured hay containing 15 per cent moisture	Dry weight	Cured hay containing 15 per cent moisture	Dry weight	Cured hay containing 15 per cent moisture
lb.	lb.	lb.	lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.
8	2	8	.....	2 890	2 1,753	1 1,727	2 385	1 1,232	1 1,802
8	2	.....	8	2 1,157	3 67	2 969	2 1,846	1 1,242	1 1,814

There does not appear to be any difference in the yielding ability of these two clovers, when used in the standard hay mixture.

VARIETY TEST WITH RED CLOVER

The object of this experiment is to compare the results in hardiness, yield, and quality of hay produced from different varieties and strains of red clover procured from various sources.

The results in 1928 are from fourteen varieties which were seeded on June 2, 1927, in quadruplicate one-fortieth-acre plots, using Alaska oats as a nurse-crop. The results are as follows:—

RESULTS OF VARIETY TEST WITH RED CLOVER

Variety	Yield per acre from first-year meadow			
	1928		Average 1924-28	
	Dry weight	Cured hay containing 15 per cent moisture	Dry weight	Cured hay containing 15 per cent moisture
	tons lb.	tons lb.	tons lb.	tons lb.
Alta Swede	2 902	2 1,767	1 1,590	2 224
Oxdrift	2 516	2 1,313	.....	.....
Early Swedish	2 73	2 792	1 1,107	1 1,655
Late Swedish	2 70	2 788	.....	.....
Wild (Suttons)	2 7	2 714	.....	.....
Wild (Suttons 115)	1 1,846	2 525	.....	.....
Chilean	1 1,763	2 427	.....	.....
Kapuskasing	1 1,546	2 172	1 1,249	1 1,822
St. Clet	1 1,407	2 8	1 1,354	1 1,946
Alfred	1 1,392	1 1,991	.....	.....
C. E. F.	1 1,338	1 1,927	1 1,261	1 1,836
Chateauguay	1 1,036	1 1,572	1 1,032	1 1,567
Marche	1 761	1 1,248	.....	.....
Venito	1 29	1 387	.....	.....

From observation on this experiment it has been noted that there is a great tendency for the southern grown sorts such as the Italian varieties to kill out and yet in some cases the yields of these will compare favourably with the other varieties. This can be explained by the fact that a volunteer crop of alsike and in some cases timothy may replace the red clover where it has killed out.

VARIETY TEST WITH TIMOTHY

The object of this experiment is to compare the results in yield and quality of hay produced from different varieties and strains of timothy.

In 1926, three varieties were sown in quadruplicate one-fortieth-acre plots. In 1927 the experiment was repeated in a similar manner.

The results in 1928 from these two seedings are as follows:—

RESULTS OF VARIETY TEST WITH TIMOTHY

Variety	Yield per acre, 1928			
	First-year meadow		Second-year meadow	
	Dry weight	Cured hay containing 15 per cent moisture	Dry weight	Cured hay containing 15 per cent moisture
	tons lb.	tons lb.	tons lb.	tons lb.
Ohio	1 821	1 1,319	2 1,993	3 1,051
Commercial	1 773	1 1,262	3 41	3 1,107
Boon	1 469	1 905	3 89	3 1,164

METHODS OF SEEDING ALFALFA FOR HAY PRODUCTION

The objects of this experiment are to compare the results in yield and quality of hay produced from alfalfa, when seeded broadcast at the rate of 20 pounds per acre, versus when seeded in rows 12 inches apart; and also to compare the results from plots when seeded with and without a nurse-crop.

In 1926 this experiment was seeded in quadruplicate one-fortieth-acre plots, using barley as a nurse-crop. In 1927 it was repeated in a similar manner using oats as the nurse-crop. The results are as follows:—

METHODS OF SEEDING ALFALFA FOR HAY PRODUCTION

Method	Yield per acre									
	Second-year meadow 1928				First-year meadow 1928				Average, first and second-year meadow 1924-28			
	Dry weight		Cured hay containing 15 per cent moisture		Dry weight		Cured hay containing 15 per cent moisture		Dry weight		Cured hay containing 15 per cent moisture	
	tons	lb.	tons	lb.	tons	lb.	tons	lb.	tons	lb.	tons	lb.
With a nurse-crop:—												
In drills 12 inches apart	3	345	3	1,465	3	65	3	1,135	2	136	2	866
Broadcast 20 lb. per acre	3	530	3	1,682	2	1,932	3	979	2	271	2	1,025
Without a nurse-crop:—												
In drills 12 inches apart	3	591	3	1,754	3	13	3	1,074	2	842	2	1,696
Broadcast 20 lb. per acre	3	658	3	1,833	3	789	3	1,987	2	1,153	3	62

According to the figures in this table broadcast seeding at the rate of 20 pounds per acre has given a little larger yield than when sown in rows 12 inches apart. There is also less danger of weeds becoming established with broadcast seeding.

There is quite a difference between the plots seeded with and without a nurse-crop, in favour of the latter method. This, however, varies considerably from year to year, depending on the nature of the season, the stand of nurse-crop, etc. It is most marked in the first cut of the new meadow. Considering the average results, however, it is doubtful if the increase in yield is sufficient to justify the adoption of this method on a large scale, as it means the loss of one season's crop and there is also a greater tendency for the weeds to become established where no nurse-crop is present.

NITRO-CULTURE ON ALFALFA

The object of this experiment is to compare the results in yield and quality of hay produced from alfalfa when seeded with and without nitro-culture treatment.

In 1926 this experiment was seeded in quadruplicate one-fortieth-acre plots at the rate of 20 pounds per acre without a nurse-crop. In 1927 it was repeated in a similar manner. The results are as follows:—

RESULTS WITH NITRO-CULTURE ON ALFALFA

Treatment	Yield per acre									
	Second-year meadow 1928				First-year meadow 1928				Average, first and second-year meadow 1924-28			
	Dry weight		Cured hay containing 15 per cent moisture		Dry weight		Cured hay containing 15 per cent moisture		Dry weight		Cured hay containing 15 per cent moisture	
	tons	lb.	tons	lb.	tons	lb.	tons	lb.	tons	lb.	tons	lb.
Treated	3	99	3	1,175	3	922	4	144	1	1,964	2	664
Untreated	2	1,125	3	29	3	176	3	1,266	1	1,810	2	482

VARIETY TEST WITH ALFALFA

The object of this experiment is to compare the results in hardiness, yield, and quality of hay produced from different varieties and strains of alfalfa.

In 1926 eight varieties were seeded on May 28, in quadruplicate one-fortieth-acre plots, using barley as a nurse-crop. In 1927 the experiment was repeated with the same eight varieties in a similar manner, except that oats were used as the nurse-crop. The results are as follows:—

RESULTS OF VARIETY TEST WITH ALFALFA

Variety	Yield per acre							
	Second-year meadow 1928				First-year meadow 1928			
	Dry weight		Cured hay containing 15 per cent moisture		Dry weight		Cured hay containing 15 per cent moisture	
	tons	lb.	tons	lb.	tons	lb.	tons	lb.
Falcata, Par. Alfalfa Farm	1	1,929	2	622	1	508	1	951
Cossack, D.I.S. Co	1	1,812	2	485	1	960	1	1,482
Cossack, Par. Alfalfa Farm	1	1,698	2	351	1	1,676	2	325
Baltic, D.I.S. Co	1	1,684	2	334	1	1,251	1	1,825
Grimm, Alta. Seed Growers	1	1,610	2	247	1	1,101	1	1,648
Grimm, Kap. Grown	1	1,553	2	180	1	873	1	1,380
Grimm, A.B. Lyman	1	1,476	2	89	1	500	1	941
Variegated, Peel	1	1,217	1	1,785	1	863	1	1,368

NITRO-CULTURE ON RED CLOVER

The object of this experiment is to compare the results from red clover when seeded with and without nitro-culture treatment. In 1927 this experiment was seeded in quadruplicate one-fortieth-acre plots, using oats as a nurse-crop. The results are as follows:—

RESULTS WITH NITRO-CULTURE ON RED CLOVER

Treatment	Yield per acre from first-year meadow							
	1928				Average 1924-28			
	Dry weight		Cured hay containing 15 per cent moisture		Dry weight		Cured hay containing 15 per cent moisture	
	tons	lb.	tons	lb.	tons	lb.	tons	lb.
Treated	1	1,229	1	1,799	1	1,060	1	1,600
Untreated	1	1,287	1	1,867	1	1,137	1	1,691

PRODUCTION OF SEED

RED CLOVER SEED PRODUCTION

The objects of this experiment are to compare the results obtained in yield and quality of seed produced from using first or second cutting of red clover for seed production; and also to compare the yields of seed obtained from seeding broadcast, in rows 12 inches apart, and in rows 24 inches apart, and also to compare the monetary returns from red clover used as a hay crop versus when used as a seed crop.

The series which was harvested in 1928 was seeded on June 4, 1927, in quadruplicate one-fortieth-acre plots, using Alaska oats as a nurse-crop. The results are as follows:—

RED CLOVER SEED PRODUCTION RESULTS IN 1928

Method of seeding and purpose of crop	Yield per acre			Value of crop
	Of seed	Of hay and clover straw		
	lb.	tons	lb.	$ cts.
Broadcast, two cuttings for hay		2	299	30 09
Broadcast, first cutting for hay, second for seed		2	418	30 93
Broadcast, first cutting for seed	51	1	1,130	22 23
Rows 12 inches apart, first cutting for seed	50	1	1,300	22 12
Rows 24 inches apart, first cutting for seed	53	1	1,030	22 79

It was found that no second crop developed which was worth while harvesting either for hay or seed.

The yields of seed are practically the same from the three different methods of seeding. In view of this fact the broadcast method would appear to be the best method to employ as there is less tendency for the weeds to become established than where the seed is sown in rows.

With hay valued at $14 per ton, clover straw at $2.80 per ton and clover seed at 35 cents per pound, the hay crop has given the better returns. It should be pointed out, however, that the season was particularly unfavourable for the production of clover seed owing to the unusual amount of rain at flowering and curing time.

ALSIKE SEED PRODUCTION

The object of this experiment is to compare the results obtained in yield and quality of seed produced from alsike when sown with and without a nurse-crop and also when sown at different dates.

In 1927 the first series of this experiment was seeded on June 6, the second on June 20, and the third on July 4, in quadruplicate one-fortieth-acre plots, using Alaska oats as the nurse-crop. The rate of seeding was 5 pounds per acre. The results in 1928 are as follows:—

ALSIKE SEED PRODUCTION, YIELD IN 1928

Date of seeding	Yield per acre			
	Seeded with nurse-crop		Seeded without nurse-crop	
	bush.	lb.	bush.	lb.
Seeded June 6	1	18	1	12
Seeded June 20	1	18	1	03
Seeded July 4	1	03	1	08

TIMOTHY SEED PRODUCTION

The object of this experiment is to compare the results in yield and quality of seed produced from seeding broadcast in combination with red clover, broadcast alone, in rows 12 inches apart, and in rows 24 inches apart.

The plot seeded with a mixture of timothy and red clover is cut for hay the first year and saved for seed the second; the idea being that the red clover will have largely died out and consequently the stand would be mostly timothy.

In 1926 this experiment was seeded in quadruplicate one-fortieth-acre plots. In 1927 it was repeated in a similar manner. The results to date are as follows:—

TIMOTHY SEED PRODUCTION

—	Seed sown per acre	Yield per acre							
		Seeded 1927 yield 1928		Seeded 1926 yield 1928		Four-year average first-year crop		Five-year average second-year crop	
	lb.	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.
Broadcast, {timothy	10	.....		.....		.....		.....	
Broadcast, {red clover	8	.....		4	01	.....		4	27
Broadcast, timothy	10	4	28	4	38	4	25	5	13
Rows 12 inches apart	.....	4	41	4	45	4	07	5	02
Rows 24 inches apart	.....	3	46	3	36	3	30	5	13

If pure timothy seed is desired, it is not advisable to sow a mixture of red clover and timothy, as the crop continues to remain more or less of a mixture even during the second year and this makes it impossible to obtain pure seed.

The average results show that there is not much difference between that seeded broadcast and in rows, and considering the fact that fields sown in rows are quite apt to become weedy unless cultivated, which would take extra time and naturally add to the cost of production, it would appear as though the broadcast method is to be preferred.

FERTILIZER EXPERIMENTS

The object of this experiment is to determine to what extent commercial fertilizers including nitrate of soda, superphosphate, muriate of potash and basic slag may be economically employed for the growing of grain, hay and silage crops on clay soil in Northern Ontario. The various fertilizer materials used were applied to the first crop under the following rotation: First year, O.P.V.; second year, barley; third year, clover hay; and fourth year, mixed hay.

For this test an area of clay-loam soil which appeared fairly uniform was selected in the autumn of 1925 and fall-ploughed. This was sown to O.P.V. in 1926 and after this crop was harvested the land was again fall-ploughed in preparation for the barley, which was seeded on May 28, 1927, together with the standard mixture of grass and clover seeds which included timothy 8 pounds, red clover 8 pounds, and alsike clover 2 pounds per acre.

The second area in this experiment was ploughed in the autumn of 1926, and the third area in the autumn of 1927. These are being treated in a similar manner to that of the first area, so that in 1928 the three first crops of the rotation, namely, O.P.V., barley and clover hay, were all represented.

The total quantities of fertilizer were applied the same date as the seed was sown with the exception of the nitrate of soda, which was divided into two applications about one month apart.

This experiment will have to be continued for a number of years before any reliable conclusions can be drawn.

POULTRY

The Barred Plymouth Rock is the only breed of hens kept at this Station, and seems to meet the requirements of a general purpose breed very well.

The prices charged per hundred pounds for the various feeds used during the year are based on the average market prices which are as follows:—

Wheat, $3; oats, $2.47; barley, $2.50; corn, $2.90; bran, $1.80; middlings, $1.90; meat meal, $5.21; beef scrap, $5.45; skim-milk, $0.50; oyster-shell, $2.20; grit, $1.75; charcoal, $3.45; clover leaves, $1.

SKIM-MILK VERSUS BEEF SCRAP

The object of this experiment is to compare the results from the use of skim-milk and beef scrap as a source of animal protein for winter egg production. In 1927-28 this test was commenced on November 1, and continued until April 30. One hundred pullets were used. They were divided into two pens of 50 birds each. The ration given to each pen was the same with the exception of the skim-milk and beef scrap. The scratch grain consisted of two parts each of whole wheat and cracked corn and one part each of whole oats and barley. The dry mash was made up of equal parts of bran, middlings, corn meal, ground oats and barley. The beef scrap was fed from a hopper and the skim-milk from a drinking vessel. Mineral matter and green feed were also supplied to each lot. The results are as follows:—

RESULTS WITH SKIM-MILK VERSUS BEEF SCRAP

Items		Skim-milk 1928	Beef scrap 1928	Skim-milk four-year average	Beef scrap four-year average
Number of birds	No.	50	50	50	50
Weight at beginning, Nov. 1	lb.	260	242	232·5	226·0
Weight at finish, April 30	lb.	235	256	271·8	268·8
Pounds of scratch	lb.	1,552	1,704	1,647·5	1,689·5
Pounds of mash	lb.	346	397	551·3	562·5
Pounds of green feed	lb.	336	324	335·0	326·3
Pounds of milk	lb.	950	.....	1,386·5	.....
Pounds of meat scrap	lb.	.....	114	.....	105·5
Pounds of grit	lb.	49	30	28·4	22·5
Pounds of oyster shell	lb.	76	61	85·8	65·8
Pounds of charcoal	lb.	12	15	9·8	10·8
Number of eggs laid	No.	4,777	4,621	4,648·3	4,594·8
Cost of animal feed	$	4 75	6 21	6 93	5 44
Total cost of feed	$	62 33	68 54	74 22	73 53
Value of eggs laid	$	238 85	231 05	232 42	229 74
Cost per doz	$	0 16	0 18	0 19	0 19
Profit	$	176 52	162 51	158 20	156 21

The figures from this experiment in 1928 show that the pen getting skim-milk has given better results than the one on beef scrap, but over a four-year period the cost per dozen and the profit are practically equal, which would seem to indicate that farmers who have a supply of skim-milk would not benefit materially by purchasing other animal feed for their poultry, while those who may not have any skim-milk may use beef scrap to good advantage.

LIGHTS VERSUS NO LIGHTS

The object of this experiment is to compare the results in egg production by the use of electric lights from four o'clock in the morning until daylight, and the results without lights.

This test has been conducted for five years, using 100 pullets in each year. In 1927-28 it was commenced on November 1 and continued until April 30. The birds were divided equally into two pens of 50 each. All conditions were made similar except that the one pen had these extra hours of light to work. The results are as follows:—

LIGHTS VERSUS NO LIGHTS—RESULTS FROM NOVEMBER 1 TO APRIL 30

Items		Lights, 1928	No lights, 1928	Lights, five-year average	No lights, five-year average
Number of birds	No.	50	50	50	50
Weight at beginning	lb.	210	232	216·0	221·8
Weight at finish	lb.	230	246	259·4	259·4
Pounds of scratch	lb.	1,595	1,819	1,593·0	1,662·4
Pounds of mash	lb.	215	230	484·2	434·8
Pounds of green feed	lb.	301	307	295·8	303·8
Pounds of milk	lb.	803	770	582·4	573·4
Pounds of meat scrap	lb.	89	91	95·8	98·4
Pounds of grit	lb.	23	19	19·1	17·9
Pounds of oyster shell	lb.	45	49	65·6	64·0
Pounds of charcoal	lb.	22	11	14·6	9·6
Number of eggs laid	No.	4,080	4,189	3,965·8	3,670·6
Total cost of feed	$	63 98	70 24	67 35	67 99
Value of eggs laid	$	204 00	209 45	198 29	183 53
Cost per dozen	$	0 19	0 20	0 20	0 22
Profit	$	140 02	139 21	130 94	115 54

Over a five-year period the pen with lights laid nearly 300 eggs more than the pen without lights. These extra eggs are obtained when the price is usually higher.

EFFECT OF SUPPLEMENTARY FEEDS ON FERTILITY, HATCHABILITY AND VIABILITY

The object of this experiment is to determine the effect upon fertility, hatchability and viability when supplementary feeds including cod liver oil, raw liver, bone meal and a mixture of the former two are added to the regular ration given to the breeding stock.

For this test 100 pedigree hens were divided into ten pens of ten birds each, making duplicate pens for each feed under test as well as for the check pen which received the ordinary ration.

The cod liver oil was fed at the rate of one-quarter teaspoonful per bird per day; the raw liver one-half ounce per bird per day and the bone meal was mixed in the dry mash at the rate of 5 per cent by weight. For the pen receiving both the cod liver oil and raw liver the quantity of each was reduced one-half.

In order to eliminate any effect caused by the different males used, the experiment was divided into two periods with one week between them. The first period covered the regular pedigree mating season when the male birds were kept in their respective pens, while the second period the male birds were alternated daily. The first period covered 43 days and the second period 26 days. Separate records were kept for each of the two periods.

In 1928 the number of eggs required per chick at three weeks for each of the pens under test is as follows: Ordinary ration, 2·1; raw liver, 2·4; bone meal, 2·5; cod liver oil, 2·9; and cod liver oil and raw liver, 3. Over a three-year period the figures are as follows: raw liver, 2·2; ordinary ration, 2·5; cod liver oil and raw liver, 2·5; bone meal, 2·6; and cod liver oil, 3·1.

HATCHING RESULTS FROM DIFFERENT DATES OF SETTING

Each year the hatching season covers a period of around three months and includes settings made during the months of March, April and May.

The results obtained from those set during the different months are shown in the following table:—

HATCHING RESULTS FROM DIFFERENT DATES OF SETTING

Month set	Number of eggs set	Per cent fertile	Per cent total eggs hatched	Per cent fertile eggs hatched	Per cent chicks hatched alive when wing banded	Total eggs required for one chick hatched	Total eggs required for one chick at three weeks
	No.	%	%	%	%	No.	No.
March, 1928	1,877	88·3	55·3	62·6	59·1	1·81	3·06
Average 5 years	894	87·4	47·2	54·0	76·5	2·12	2·77
April, 1928	2,538	92·9	53·2	57·3	75·8	1·88	2·48
Average 5 years	1,364	93·0	48·6	52·2	85·2	2·06	2·41
May, 1928	571	97·0	59·0	60·8	68·2	1·69	2·48
Average 5 years	673	91·4	48·6	53·2	83·2	2·06	2·47

COST OF ARTIFICIAL INCUBATION

With the object of determining the amount of fuel required and consequently the cost of hatching in different sized machines, records were kept of the amounts used by two machines, one of which burns coal oil and one coal. The following table gives the details of the test:—

COST OF ARTIFICIAL INCUBATION

Items		Buckeye No. 5 capacity 600 eggs		Candee capacity 1,200 eggs	
		1928	Average 3 years	1928	Average 2 years
Number of settings	No.	6	5	2	2·5
Number of eggs	No.	3,373	2,821	1,613	2,327
Oil used	gal.	35·4	29·7	.....	.....
Coal used	lb.	.....	.....	799	938
Cost of fuel	$	12 39	10 40	7 99	9 38
Cost per 100 eggs	$	0 37	0 36	0 50	0·40

COAL REQUIRED TO OPERATE BROODER STOVE

The object of this experiment is to determine the quantity and cost of coal required to operate the ordinary No. 18 Buckeye brooder stove. This brooder, in a house 10 by 12 feet in size, is supposed to furnish sufficient heat for 500 chicks until they are three to four weeks of age, at which time they would require more space for best results. In actual practice, however, it is not always possible to have 500 chicks hatched at one time, as this would require quite a large flock of breeding hens and also considerable incubator space. In fact, better results are generally obtained when the number of chicks is kept below the rating of the brooder, particularly if the operator has had only a limited experience in the brooding and rearing of chicks. The following table gives the details of the test:—

COAL REQUIRED TO OPERATE BROODER STOVE

Items		1928			Three-year average		
		April	May	June	April	May	June
Coal used per month	lb.	399·6	328·3	305·5	406·4	302·6	279·5
Coal used per day	lb.	13·2	10·6	10·2	13·5	9·8	9·3
Value of coal used	$	4 00	3 28	3 06	4 06	3 03	2 80
Capacity of brooder	No.	500	500	500	500	500	500
Cost per 100 chicks per month	$	0 80	0 66	0 61	0 81	0 61	0 56

RATIONS

In formulating rations the home grown grains such as wheat, oats and barley are featured to as large an extent as would appear to be consistent in a good ration. The standard scratch ration in use is composed of two parts each of whole wheat and cracked corn, and one part each of whole oats and barley; while the laying mash consists of equal parts of bran, middlings or shorts, corn meal, crushed oats, and ground barley, plus ten per cent meat meal. Oyster-shell, grit, charcoal and in some cases beef scrap are available in hoppers at all times.

During the winter months the birds are given a warm wet mash at noon in troughs, as much as they will clean up readily.

Clover or alfalfa leaves make a very convenient and excellent form of green feed, but mangels or sprouted oats may also be used to good advantage.

PEDIGREE WORK

The exact egg production of each individual hen is obtained through the medium of the trapnest. This, together with the individuality and general type of the birds is used as the basis for utility selection. By this method, only those birds are used for breeding purposes which have pedigrees showing high production of good sized eggs and are also of desirable type. Particular attention is given to the selection of the males used, and those whose sisters and daughters prove to be high producers are retained and used for a number of years.

The selection of the breeding stock on the basis of production is probably the greatest single factor in increasing the production of the individual birds and, consequently, the average of the entire flock. This fact is shown in the following table which gives the total number of birds on hand on December 31 for the last six years with production records of 150 eggs or over.

NUMBER OF HENS ON HAND WITH RECORDS OF 150 EGGS OR OVER FOR THE LAST SIX YEARS

Date Dec. 31	150 eggs or over	175 eggs or over	200 eggs or over	225 eggs or over	250 eggs or over	275 eggs or over	300 eggs or over	Total number of hens
1923	19	11	7	.....	.....	.....	.....	37
1924	44	24	10	.....	.....	.....	.....	78
1925	44	32	24	13	2	.....	1	116
1926	.....	40	40	23	14	5	.....	122
1927	.....	.....	41	57	33	5	2	138
1928	8	6	31	42	24	4	2	117

BEES

For some reason the winter of 1927-28 was rather unfavourable from the standpoint of wintering bees, and consequently the winter losses were heavier than usual. However, the summer season was very good for honey production.

RETURNS FROM APIARY

During the season of 1928, twenty colonies were used for the production of extracted honey. The results obtained are as follows:—

FINANCIAL STATEMENT OF APIARY IN 1928

Total weight of honey extracted from 20 colonies, pounds	1,505·5
Average weight produced per colony, pounds	75·3
Selling price of honey per pound	$ 0 15
Total value of honey produced	$225 83
Average value of honey produced per colony	$ 11 29

A STUDY OF HONEY-FLOW

With the object of obtaining data relative to the effect of weather conditions on the daily honey-flow, one colony of average strength was placed on scales. This colony, however, turned out to be the largest producing colony in the yard this year, so that the gains as presented in connection with this experiment are really somewhat larger than the average for the season.

RECORD OF HIVE ON SCALES IN 1928

—	May	June	July	Aug.	Sept.	Total
Gain	.....	.....	82·0	114·0	27·0	209·0
Loss	10·0	4·0	.....	.....	.....	.....

It may be noted that July and August are the two main months for honey production and this is usually the case although the greatest gain occurred on September 6, when 20 pounds were gathered. In fact on September 5, 6 and 7 this colony made a total increase of 46 pounds.

The White Dutch clover commenced to bloom on June 9, and the alsike on June 15.

OUTDOOR VERSUS CELLAR WINTERING

The object of this experiment is to compare the results obtained from bees wintered outdoors with those wintered in a cellar.

In the autumn of 1927, forty-six colonies were placed in winter quarters. Thirty-six of those were packed in the bee-yard on October 4 and 5, in the following manner: 28 in quadruple cases, 6 in double cases, and 2 in single cases. One of those packed in double cases had two queens.

The packing consisted of 6 inches of well-dried planer shavings on the sides and underneath, and about 12 inches on top, with the exception of one four-colony case in which cut hay was used. Of the thirty-six colonies wintered outside twenty-nine came through alive twenty-one of which were queen-right with an average of 4·1 frames each of bees, and eight others were queenless and had on the average 2 frames each of bees. Each colony packed outside had been fed with a sugar syrup made of 2 pounds sugar to 1 of water to a weight of 75 pounds or over. For example, if a colony weighs 50 pounds it is given 25 pounds of sugar in the form of syrup.

Ten colonies were placed in the office cellar on November 15. These were fed to 70 pounds weight or better early in the autumn. Of the ten colonies put away, five standard colonies and one side of the twin hive were alive and had on the average 2·5 frames each of bees.

The bees were removed from the cellar on May 7, which was about two weeks later than the year previous. The brood chamber of each colony was packed with three inches of planer shavings, which was left on until after the cool spring weather was over.

When wintering outside, it is always necessary to provide a good wind-break.

FOUR-COLONY VERSUS TWO-COLONY VERSUS SINGLE-COLONY WINTERING CASES

The object of this experiment is to compare the results obtained from wintering bees in four-colony, two-colony and single-colony wintering cases.

Twenty-eight of the colonies wintered outdoors were packed in quadruple, six in double and two in single wintering-cases. The kind and amount of packing in each case was the same, with the exception of one four-colony case which was packed with cut hay in place of shavings. Of the twenty-eight in quadruple cases twenty-three colonies came through alive, fifteen of which were queen-right with an average of 3·9 frames each of bees, and eight queenless with an average of 2 frames each of bees. The six colonies wintered in double cases were all alive with an average of 4·6 frames each of bees, but the two in single cases were lost. For some reason the double cases gave much the best results this year, but in former years there was practically no difference in the wintering efficiency of these different cases.

WINTERING TWO QUEENS IN ONE HIVE

The object of this experiment is to ascertain the possibility of over-wintering a number of surplus queens to be used the next spring in requeening queenless colonies or replacing weak and failing queens.

In the autumn of 1927, two hives were equipped with tight-fitting division boards, and a double entrance provided to each hive. Both sides of each hive were made quite strong with bees and each half was given a good young queen. One of these colonies was packed in the usual manner in the bee-yard in a double packing case, and the other was placed in the office cellar. In the spring, three of the four queens were alive, which indicates that it is possible to carry over some extra queens in this manner.

CARNIOLAN BEES

Until 1927 no other breed of bees had been kept at this Station except Italians. In that year, however, it was decided to establish a small out-apiary of Carniolans in order to make observations on their adaptability to this climate. This yard was established at Kitigan Station, which is about 6 miles east of Kapuskasing, in order that there would be no crossing between the two yards.

Seven colonies were placed in winter quarters in the autumn of 1927, and four colonies came through alive. Three of these were used for honey production and gave on the average 74·8 pounds each, which is practically the same as the average of the yard at Kapuskasing.

The observations to date would seem to indicate that Carniolan bees are fairly well adapted to this climate and compare favourably with the Italians as honey gatherers.

Sixteen colonies were packed in the bee-yard for winter on October 3 and 4, in the following manner: 8 in quadruple cases, 6 in double cases, and 2 in single cases. Three colonies were placed in the office cellar on November 22. One of the colonies placed in the cellar has two queens.

The five colonies of Carniolans at the Kitigan yard were packed outdoors on October 10.

FIBRE CROPS

VARIETY TEST WITH FLAX.—Only one variety, J.W.S., was under test. The seed was sown on May 21, in triplicate one-fortieth-acre plots, at the rate of 1½ bushels per acre. The crop was pulled on September 7. The average height was 35 inches and an average yield of 1 ton 1,125 pounds of dry matter per acre was obtained.

VARIETY TEST WITH HEMP.—Only one variety, Minnesota No. 8, was under test. The seed was sown on May 21, in triplicate one-fortieth-acre plots, at the rate of 1½ bushels per acre. The crop was harvested on September 29. The average height was 62 inches and the average yield per acre of dry material was 2 tons 664 pounds.

ILLUSTRATION STATIONS

Eighteen Illustration Stations were operated under the supervision of this Station during the year. The operators and locations of the Stations are as follows: A. Brouard, Mattice; Basile Gaudreault, Moonbeam; E. D. Carrere, Cochrane; Olivier Genier, Genier; H. Labreche, Val Gagne; A. Beaudry, Verner; E. Strain, Gore Bay; Wm. McColeman, Spring Bay; Wm. A. Hare, Mindemoya; Jos. Desrochers, La Reine; Jos. Lemoine, Ste. Rose de Poularies; H. Marcotte, Barraute; Eugene Robitaille, Belcourt; A. Gilbert, St. Hilarion; E. Villeneuve, Murray Bay; Jos. Gervais, Hebertville; Emile Brassard, Jonquiere; and Wm. Boily, Chicoutimi.

On ten of these Stations a four-year rotation has been established as follows:—

First year—Hoed crops,
Second year—Grain,
Third year—Clover hay,
Fourth year—Mixed hay.

On five the following five-year rotation is in use:—

First year—Hoed crops,
Second year—Grain,
Third year—Clover hay,
Fourth year—Mixed hay,
Fifth year—Hay or pasture.

While on the other three the following six-year rotation is under test:—

First year—Grain,
Second year—Clover seed,
Third year—Hoed crops.
Fourth year—Grain,
Fifth year—Clover hay,
Sixth year—Mixed hay.

In each rotation, after the mixed hay is harvested, the land is immediately ploughed and cultivated occasionally until the freeze-up. This leaves the soil in excellent condition for either the hoed crop or the grain.

Records are kept of the yields and cost of production of the various crops grown. The varieties of cereals that have been found to give the best results on the Experimental Station are given further test on these Stations and in this way the value of these varieties for different sections is determined.

Registered seed grain, certified potatoes and pure-bred poultry are produced and made available to the settlers. The Illustration Station is being featured as a means of demonstrating improved farm practices to the farmer.

A detailed report on these Stations may be found in the 1928 report of the Chief Supervisor (Eastern Stations).

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