DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
DOMINION EXPERIMENTAL FARMS

EXPERIMENTAL STATION

KAPUSKASING, ONT.

REPORT OF THE SUPERINTENDENT

SMITH BALLANTYNE

FOR THE YEAR 1925

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DOMINION EXPERIMENTAL STATION, KAPUSKASING ONTARIO

REPORT OF THE SUPERINTENDENT, SMITH BALLANTYNE

THE SEASON

January, February, March, and April each had a higher average monthly mean temperature than the average for an eight-year period. May, however, was 6 degrees below the average, which had the effect of holding up seeding operations until the latter part of the month. Of the other four growing months, June, July, and September were also below the average, while August was 4.7 degrees above the average.

October was much colder than normally, as the mean temperature was 7.2 degrees below the average, but November and December were both above the average, the former 1.4 degrees and the latter 4.4 degrees.

The total precipitation for the year was 26.66 inches, which is 2.94 inches above the eight-year average of 23.72 inches.

The five growing months received 18.06 inches, or 67.7 per cent of the year's total precipitation; while the eight-year average for the same months is 13.20 inches, or 55.6 per cent.

May, June, and July in particular had very high precipitation. This had the effect of not only delaying seeding operations very materially, but of actually drowning out the seed in many cases after it was sown.

For hours of sunshine, 1,669.3 were recorded, which is the lowest for any year during the last seven and is 106.9 hours less than the average for a seven-year period.

There was very little damage from summer frosts, which seem to be disappearing as the district becomes more opened and the cleared land increases in area.

Fall ploughing was stopped by frost on November 6, which is about ten days earlier than usual.

METEOROLOGICAL RECORDS*

Month	Precipitation		Temperature, degrees Fah.						Sunshine	
			1925			Average eight years				
	1925	Average eight years	Minimum	Maximum	Mean	Minimum	Maximum	Mean	1925	Average seven years
	inches	inches							hours	hours
January	0·75	1·02	−47	30	− 2·7	−43·9	33·1	− 3·3	105·2	87·1
February	1·40	0·86	−42	43	3·4	−40·1	35·3	1·5	72·0	102·4
March	0·90	1·29	−30	58	14·7	−29·6	51·8	13·0	159·9	135·2
April	0·86	1·93	07	65	34·3	− 3·9	68·0	31·6	228·5	166·5
May	2·84	1·66	09	72	39·4	18·0	82·9	45·4	142·3	222·2
June	5·98	2·07	29	89	56·1	27·3	86·0	57·4	185·3	254·0
July	4·73	3·36	34	82	59·3	33·4	88·0	61·0	202·8	244·6
August	2·97	2·84	31	85	63·4	31·6	82·1	58·7	248·5	208·7
September	1·54	3·27	23	75	50·1	26·0	80·3	50·9	160·3	153·0
October	1·84	1·83	09	53	31·7	11·4	68·6	38·9	52·0	100·1
November	1·36	1·89	−20	55	24·7	−14·3	51·5	23·3	73·2	49·9
December	1·49	1·71	−30	39	10·4	−34·5	42·5	6·0	39·3	52·5
Total	26·66	23·72							1,669·3	1,776·2

*Complete monthly records for the years 1918-24 will be found in the report from this Station for 1924.

ANIMAL HUSBANDRY

Northern Ontario is well suited for "mixed farming" including dairying and the raising of live stock. In most cases there is a ready market for live stock and dairy products in the large lumber and mining centres.

The fertility of the soil is well maintained by this system of farming that also markets in a profitable way the large quantities of forage crops as well as the farm-grown grains produced.

The experimental work conducted at this Station in animal husbandry has been done with the object of determining the most suitable feeds and the best methods of feeding, housing, and handling the various classes of live stock.

The surplus young stock, which is pure-bred and suitable for breeding purposes is distributed to settlers at nominal prices, as foundation stock.

The whole herd, both dairy and beef, has been given full accreditation under the Accredited Herd System.

DAIRY CATTLE

The dairy herd on December 31, 1925, totalled thirty-five head. Of this number sixteen are pure-bred Ayrshires and include seven milch cows, five heifers, two bull calves and two bulls. The grade Ayrshires include nine milch cows and ten heifers.

During the year two of the pure-bred cows have qualified in the Canadian Record of Performance for pure-bred dairy cattle.

The Ayrshire herd has been considerably strengthened by the purchase of two females and the transfer of a young bull from Ottawa.

The two females, Ravensdale Isabel—77093— and Bessie 3rd—69069—, were purchased at Mr. Gilbert McMillan's dispersion sale on May 22. They are both good typical individuals with fair records and good breeding.

The young bull, Ottawa Supreme —88031—, was born March 20, 1924, and is a promising individual with considerable substance, style and quality. He has been given class "A" standing in the Advanced Registry for pure-bred Ayrshire bulls. His dam is Castlehill Strawberry (46236) —83931—, an imported cow with good records and breeding behind her. His sire is Shewalton Mains Supreme (22659) —83930—, an imported bull of excellent breeding, with exceptionally good milk-record and show-yard backing.

MILK RECORDS

A daily record is kept of the amount of milk given by each cow during her lactation period. The milk is tested once per month to determine the percentage of fat which it contains. A record is kept of the feed consumed by each animal during her lactation period and for the time during which she was dry previous to freshening. From these data are calculated the amount of feed required to maintain each animal per year, the cost of maintenance and the cost of milk-production.

The following table shows the amount of milk produced by each cow that completed a lactation period during the calendar year of 1925, except for the cow Landlady, which has not completed her lactation and will probably milk throughout January, 1926. It also shows the cost of feed and the value of the milk produced. As the value of the calf and the cost of labour are neglected in all cases the profit column is really a comparison between the cost of feed consumed and the value of the milk produced.

The cost of feed is based on the following rates, which represent the average cost of production figures for the roughages and cost prices for the concentrates.

Silage, O.P.V. or sunflowers, per ton	$10 00
Roots, per ton	6 00
Hay, per ton	8 50
Meal, per 100 lb	2 00
Pasture, per day	0 10

Name of cow	Age at beginning of lactation period	Date of dropping calf	Number of days in lactation period	Total pounds of milk produced	Daily average yield of milk	Average per cent fat in milk	Value of whole milk at 10 cents per quart	Total cost of feed	Cost per 100 pounds of milk	Profit or loss on cow, labour and calf neglected
Pure-bred Ayrshires	Years		days	lb.	lb.	%	$ cts.	$ cts.	$ cts.	$ cts.
Landlady	7	Jan. 8, 1925	358	10,175	28·4	4·46	407 00	192 87	1 90	204 13
Lady Alice	6	Jan. 30, 1925	305	9,320	30·6	4·12	372 80	188 15	2 02	184 65
Ena of Glenborough	8	Oct. 22, 1924	326	8,643	26·5	4·34	345 72	143 59	1 66	202 13
Blossom of Glenborough	8	Sept. 11, 1924	310·5	6,707	21·6	3·77	268 28	138 09	2 06	130 19
Duchess of Geneva	7	Oct. 8, 1924	328	6,673	20·3	4·17	266 92	135 54	2 03	131 38
Grade Ayrshires										
Whitie A 2	2	Sept. 23, 1924	464	8,229	17·7	4·03	329 16	172 73	2 10	156 43
Maggie A	5	Oct. 2, 1924	291	6,528	22·4	4·44	261 12	132 33	2 03	128 79
Whitie A 1	3	Feb. 27, 1925	296	6,338	21·4	4·13	253 52	135 29	2 13	118 23
Phoebe A 1 A	2	Feb. 20, 1925	310	5,452	17·6	3·67	218 08	126 51	2 32	91 57
Bloomer A	4	June 10, 1924	290	5,175	17·8	4·17	207 00	143 39	2 77	63 61
Peggy B	3	Feb. 19, 1925	301	5,125	17·0	3·65	205 00	107 24	2 09	97 76
Grade Shorthorns										
23	7	June 21, 1924	557	12,000	21·5	3·99	480 00	197 90	1 65	282 10
36	7	Oct. 21, 1924	327	5,990	18·3	3·76	239 60	134 17	2 24	105 43
48	3	Dec. 1, 1924	342	5,279	15·4	3·98	211 16	133 43	2 53	77 73
13	4	Aug. 24, 1924	311	5,078	16·3	4·12	203 12	118 84	2 34	84 28

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

The object of this experiment is to determine the relative value of sunflower and O.P.V. silage for milk production. For this test ten milking cows were selected which were in such stage of lactation that they would all continue milking throughout the following four thirty-day periods which the experiment was to cover. This experiment has been conducted for three years, and in 1925, the ten cows used were made up of three pure-bred Ayrshires, three grade Ayrshires and four grade Shorthorns. The experiment commenced on December 1, 1924, and each animal received a uniform ration during the whole period differing only in the variety and quantity of silage fed as follows:—

Period 1.—December 1 to December 31: sunflowers, 45 pounds per day.
Period 2.—January 1 to January 30: O.P.V., 40 pounds per day.
Period 3.—January 31 to March 1: sunflowers, 45 pounds per day.
Period 4.—March 2 to March 31: O.P.V., 40 pounds per day.

The sunflower silage contained more moisture than the O.P.V. and on this account it was found that the cattle could handle about five pounds per day more of the former than the latter. This made the amount of dry matter consumed in each period about equal, which should be a fair basis of comparison.

Seven days are taken to make the transfer from one silage to the other, and the milk records are figured on the latter twenty-one days in each period, so that this gives two full days on the unmixed silage before the milk yields are considered. Each cow got ten pounds of hay per day, and a grain ration consisting of bran, four parts; ground oats, two parts; ground barley, three parts; and oilcake, two parts; fed at the rate of twelve pounds each per day.

In order to eliminate any error which might occur owing to the natural decline in milk flow, the results obtained during periods one and three were averaged and compared with the results obtained in period two. In like manner periods two and four were averaged and compared with period three. The average of these two, forms the basis of comparison. The results obtained are as follows:—

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

Items	Period 1 1925	Period 2 1925	Period 3 1925	Average periods 1 and 3 1925
Experimental Feeds	Sunflowers	O.P.V.	Sunflowers	Sunflowers
Number of cows in test ..... No.	10	10	10	10
Milk produced by 10 cows in 21 days ..... lb.	5,494·10	4,852·90	4,767·0	5,130·55
Average milk per cow per day ..... lb.	26·16	23·11	22·70	24·43
Average per cent fat in milk ..... %	3·75	4·66	3·94	3·84
Fat produced by 10 cows in 21 days ..... lb.	206·0	226·0	188·0	197·0
Average fat per cow per day ..... lb.	0·98	1·08	0·90	0·94
Total meal consumed in 21 days ..... lb.	2,520·0	2,520·0	2,520·0	2,520·0
Total hay consumed in 21 days ..... lb.	2,100·0	2,100·0	2,100·0	2,100·0
Total silage consumed in 21 days ..... lb.	9,450·0	8,400·0	9,450·0	9,450·0
Meal consumed per 100 pounds milk produced ..... lb.	45·87	51·93	52·86	49·12
Hay consumed per 100 pounds milk produced ..... lb.	38·22	43·27	44·05	40·93
Silage consumed per 100 pounds milk produced ..... lb.	172·0	173·09	198·24	184·19
Meal consumed per 100 pounds fat produced ..... lb.	1,223·30	1,115·04	1,340·43	1,279·19
Hay consumed per 100 pounds fat produced ..... lb.	1,019·42	929·20	1,117·02	1,065·99
Silage consumed per 100 pounds fat produced ..... lb.	4,587·38	3,716·81	5,026·60	4,796·95
Findings from Experiment				
Cost of meal mixture ..... $	50 40	50 40	50 40	50 40
Value of hay fed ..... $	8 93	8 93	8 93	8 93
Value of silage fed ..... $	47 25	42 00	47 25	47 25
Total cost of feed ..... $	106 58	101 33	106 58	106 58
Feed cost to produce 100 pounds milk ..... $	1 94	2 09	2 24	2 08
Feed cost to produce 100 pounds fat ..... $	51 74	44 84	56 69	54 10

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

Items	Period 2 1925	Period 3 1925	Period 4 1925	Average periods 2 and 4 1925
Experimental Feeds	O.P.V.	Sunflowers	O.P.V.	O.P.V.
Number of cows in test....No.	10	10	10	10
Milk produced by 10 cows in 21 days....lb.	4,852·90	4,767·0	3,941·60	4,397·25
Average milk per cow per day....lb.	23·11	22·70	18·77	20·94
Average per cent fat in milk....%	4·66	3·94	3·91	4·32
Fat produced by 10 cows in 21 days....lb.	226·0	188·0	154·0	190·0
Average fat per cow per day....lb.	1·08	0·90	0·73	0·90
Total meal consumed in 21 days....lb.	2,520·0	2,520·0	2,520·0	2,520·0
Total hay consumed in 21 days....lb.	2,100·0	2,100·0	2,100·0	2,100·0
Total silage consumed in 21 days....lb.	8,400·0	9,450·0	8,400·0	8,400·0
Meal consumed per 100 pounds milk produced....lb.	51·93	52·86	63·93	57·31
Hay consumed per 100 pounds milk produced....lb.	43·27	44·05	53·28	47·76
Silage consumed per 100 pounds milk produced....lb.	173·09	198·24	213·11	191·03
Meal consumed per 100 pounds fat produced....lb.	1,115·04	1,340·43	1,636·36	1,326·32
Hay consumed per 100 pounds fat produced....lb.	929·20	1,117·02	1,363·63	1,105·26
Silage consumed per 100 pounds fat produced....lb.	3,716·81	5,026·60	5,454·55	4,421·05
Findings from Experiment				
Cost of meal mixture....$	50 40	50 40	50 40	50 40
Value of hay fed....$	8 93	8 93	8 93	8 93
Value of silage fed....$	42 00	47 25	42 00	42 00
Total cost of feed....$	101 33	106 58	101 33	101 33
Feed cost to produce 100 pounds milk....$	2 09	2 24	2 57	2 30
Feed cost to produce 100 pounds fat....$	44 84	56 69	65 80	53 33

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

Items	Average results 1925	Average results 1925	Three-year average 1923-25	Three-year average 1923-25
Experimental Feeds	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.	4,948·78	4,625·08	5,140·93	4,973·69
Average milk per cow per day....lb.	23·57	22·02	24·48	23·68
Average per cent fat in milk....%	3·89	4·50	3·85	3·90
Fat produced by 10 cows in 21 days....lb.	192·50	208·0	198·17	193·83
Average fat per cow per day....lb.	0·92	0·99	0·94	0·92
Total meal consumed in 21 days....lb.	2,520·0	2,520·0	2,583·0	2,583·0
Total hay consumed in 21 days....lb.	2,100·0	2,100·0	2,058·0	2,058·0
Total silage consumed in 21 days....lb.	9,450·0	8,400·0	9,450·0	8,400·0
Meal consumed per 100 pounds milk produced....lb.	50·92	54·49	50·24	51·93
Hay consumed per 100 pounds milk produced....lb.	42·43	45·40	40·03	41·38
Silage consumed per 100 pounds milk produced....lb.	190·96	181·62	183·82	168·89
Meal consumed per 100 pounds fat produced....lb.	1,309·09	1,211·54	1,303·43	1,332·61
Hay consumed per 100 pounds fat produced....lb.	1,090·91	1,009·62	1,038·50	1,061·76
Silage consumed per 100 pounds fat produced....lb.	4,909·09	4,038·46	4,768·63	4,333·69
Findings from Experiment				
Cost of meal mixture....$	50 40	50 40	48 33	48 33
Value of hay fed....$	8 93	8 93	10 42	10 42
Value of silage fed....$	47 25	42 00	36 23	32 20
Total cost of feed....$	106 58	101 33	94 98	90 95
Feed cost to produce 100 pounds milk....$	2 15	2 19	1 85	1 83
Feed cost to produce 100 pounds fat....$	55 37	48 72	47 93	46 92

Deductions.—The data would seem to indicate that there is not a great deal of difference in the feeding value of sunflower and O.P.V. silages for dairy cows.

In actual milk-production, however, the sunflower silage seems to have a slight advantage over the O.P.V.; while in per cent of fat there is little to choose as this factor has varied from year to year.

In feed cost to produce 100 pounds of milk the O.P.V. has an advantage of two cents in the two-year average. This is caused by the greater quantity of sunflowers being consumed; while both are charged at an equal rate.

The experiment is being repeated another year.

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. It has been conducted during the same periods as the experiment with the milking cows, and for the same three years.

On December 1, 1924, five grade Shorthorns and five Ayrshires, two purebreds and three grades, were selected for this test. 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. The first two years of the test, an increase was made in the silage and grain allowance at the end of the second period, but this year no change was made.

The ration per day fed each of the ten calves during the four periods is as follows:—

SUNFLOWER VERSUS O.P.V. SILAGE FOR GROWING CALVES—RATION GIVEN

Periods	Hay	Meal	Silage
Period 1—Sunflowers	6	3	30
Period 2—O.P.V	6	3	25
Period 3—Sunflowers	6	3	30
Period 4—O.P.V	6	3	25

The grain mixture consisted of equal parts of bran, whole oats and oilcake. The results obtained are as follows:—

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

Items	Average results 1925	Average results 1925	Three-year average 1923-25	Three-year average 1923-25
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.	310·0	276·50	350·67	317·67
Average daily gain per calf....lb.	1·03	0·92	1·17	1·06
Meal consumed by 10 calves in 30 days....lb.	900·0	900·0	1,200·0	1,200·0
Hay consumed by 10 calves in 30 days....lb.	1,800·0	1,800·0	1,900·0	1,900·0
Silage consumed by 10 calves in 30 days....lb.	9,000·0	7,500·0	6,400·0	5,500·0
Meal consumed per 100 pounds gain....lb.	290·32	325·50	342·20	377·75
Hay consumed per 100 pounds gain....lb.	580·65	650·99	541·82	598·10
Silage consumed per 100 pounds gain....lb.	2,903·23	2,712·48	1,825·08	1,731·36
Findings from experiment				
Cost of meal mixture....$	18 00	18 00	22 43	22 43
Value of hay....$	7 65	7 65	9 65	9 65
Value of silage....$	45 00	37 50	26 05	22 25
Total cost of feed....$	70 65	63 15	58 13	54 33
Feed cost to produce 100 pounds gain....$	22 79	22 84	16 58	17 10

Deductions.—The results obtained this year and also the two-year average would seem to indicate that the sunflower silage is the better of the two as a feed for growing calves.

This experiment will be repeated another year.

BEEF CATTLE

The herd of beef cattle on December 31, 1925, totalled forty-five head. Of this number fifteen are pure-bred Shorthorns, and include eight cows, one heifer, three heifer calves, two bull calves and one bull. The grade Shorthorns include fourteen cows, nine heifers, and seven heifer calves.

The eight pure-bred Shorthorn cows were transferred to this Station from the Indian Head Farm and the herd sire, Dictator —125442— was obtained from the Brandon Farm in exchange for the bull Jubilee Prince —151283—.

The pure-bred heifer calves will be retained until the Station herd is of sufficient size, after which they will be disposed of to settlers as foundation stock. The bull calves are disposed of to settlers as herd sires at a nominal price.

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

The object of this experiment is to determine the relative value of sunflower versus O.P.V. silage when used as the major portion of the winter ration for beef cattle. This test covered the same four thirty-day periods as those with the milking cows and growing calves.

Ten head of dry beef cattle were selected and weighed on December 1, 1924. 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 the first and third periods, they received sunflower silage and during periods two and four they received O.P.V. During the first and third periods, each animal got eight pounds of hay per day and thirty-five pounds of silage, but no grain. During the second and fourth periods the ration was the same as outlined, only that O.P.V. silage was fed instead of sunflower, and at five pounds less per head per day. The results obtained are as follows:—

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

Items	Average results 1925	Average results 1925	Three-year average 1923-1925	Three-year average 1923-25
Experimental ration	Sunflowers	O.P.V.	Sunflowers	O.P.V.
Number of cattle in test.....No.	10	10	10	10
Total gain of 10 cows in 30 days.....lb.	209·50	160·00	285·00	194·00
Average daily gain per cow.....lb.	0·70	0·53	0·95	0·65
Meal consumed by 10 cows in 30 days.....lb.	.....	.....	280·0	280·0
Hay and straw consumed by 10 cows in 30 days...lb.	2,400·0	2,400·0	2,800·0	2,800·0
Silage consumed by 10 cows in 30 days.....lb.	10,500·0	9,000·0	10,550·0	9,050·0
Meal consumed per 100 pounds gain.....lb.	.....	.....	98·25	144·33
Hay and straw consumed per 100 pounds gain.....lb.	1,145·58	1,500·0	982·46	1,443·30
Silage consumed per 100 pounds gain.....lb.	5,011·93	5,625·0	3,701·75	4,664·95
Findings from Experiment				
Cost of meal mixture..... $	.....	.....	5 14	5 14
Value of hay and straw..... $	10 20	10 20	14 40	14 40
Value of silage..... $	52 50	45 00	40 23	34 48
Total cost of feed..... $	62 70	55 20	59 77	54 02
Feed cost to product 100 pounds gain..... $	29 93	34 50	20·97	27 85

Deductions.—The results obtained from this experiment, both this year and for the three-year average, show an advantage for the sunflower over the O.P.V. silage. This experiment will be repeated another year.

From the figures obtained and also from observation it is quite evident that silage made from either sunflowers or a mixture of oats, peas and vetch makes an excellent winter feed for dairy cattle, beef cattle and growing calves.

SHEEP

Pure-bred Shropshire is the only breed of sheep that has been kept on this Station. The breeding flock at present consists of thirty-one ewes, seven ewe lambs and two rams. There are also on hand one yearling ram and three ram lambs.

In 1925 twenty-five lambs were born. Of these, twenty-two were in good condition when the flock went out to pasture.

During the summer the flock was again attacked by dogs during the day time when three ewes and three lambs were killed outright, and several others badly worried. With the number of dogs at present in this section it seems almost impossible to carry on sheep-raising with any degree of success. A high wire corral fence will protect the flock from dogs at night, but there is always the danger of them being attacked during the day.

Sheep would do remarkably well in this part of Ontario were it not for the dog-menace. During the summer all they require is access to suitable tame grass and clover pasture. In the winter, considerable exercise together with a ration of two and one-half pounds, of clover or alfalfa hay, and one-half pound of grain each per day will bring them through in good condition. The grain mixture used is composed of whole oats, three parts; bran, one part; and oilcake, five per cent.

Each year after weaning the ewes are given an additional amount of grain and if possible fresh clover pasture as a flushing ration previous to the breeding season.

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

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

For this test nine ewe lambs were weighed on December 1, 1924. Their ration was the same for the four thirty-day periods that the experiment covered with the exception of the variety of silage given. In the first and third periods sunflower silage was used and during periods two and four it was replaced by O.P.V.

The silage was fed at the rate of one pound each per day, and in addition each lamb received two pounds of clover hay and one-half pound of grain per day. The grain mixture consisted of whole oats 3 parts, bran 1 part plus 5 per cent oilcake. The results obtained are as follows:—

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

Items	Average results 1925	Average results 1925	Three-year average 1923-25	Three-year average 1923-25
Experimental ration	Sunflowers	O.P.V.	Sunflowers	O.P.V.
Number of lambs in test ..... No.	9	9		
Total gain of lambs in 30 days ..... lb.	111·0	63·5	8·05	6·46
Average daily gain per lamb ..... lb.	0·41	0·24	0·27	0·22
Meal consumed by lambs in 30 days ..... lb.	135·0	135·0	15·0	15·0
Hay consumed by lambs in 30 days ..... lb.	540·0	540·0	60·0	60·0
Silage consumed by lambs in 30 days ..... lb.	270·0	270·0	30·0	30·0
Meal consumed per 100 pounds gain ..... lb.	121·62	212·60	186·34	232·20
Hay consumed per 100 pounds gain ..... lb.	486·49	850·39	745·34	928·79
Silage consumed per 100 pounds gain ..... lb.	243·24	425·20	372·67	464·40
Findings from Experiment				
Cost of meal mixture ..... $	2 57	2 57	0 26	0 26
Value of hay ..... $	2 30	2 30	0 31	0 31
Value of silage ..... $	1 35	1 35	0 12	0 12
Total cost of feed ..... $	6 22	6 22	0 69	0 69
Feed cost to produce 100 pounds gain ..... $	5 60	9 80	8 57	10 68

DEDUCTIONS.—The results obtained this year and also the three-year average show an advantage for sunflower silage as a feed for wintering lambs. This experiment will be repeated another year.

SWINE

Pure-bred Yorkshire is the only breed of hogs that has ever been kept at this Station. The present herd of breeding stock consists of fifteen sows and three boars. The senior boar, Agassiz Bonus —80699—, is a particularly good type of bacon sire, and has left a lot of good stock. The junior boar, Ottawa Wonder 2—97201—, was imported in dam from the herd of the Earl of Rosebery, Dalmeny, Scotland, and has good breeding behind him. The young boar Ottawa Alexander 199—109544—, was bred at Ottawa and was recently transferred to this Station to use for serving young sows which are related to the other sires, previous to selling them to settlers as breeding animals.

During the year nineteen litters were farrowed which gave a total of 200 pigs. Of this number 159 were raised to weaning age.

The best of the young females were disposed of as foundation stock to settlers, either at weaning age or as young sows carrying their first litters. A number of males were also sold for breeding purposes.

PIG-FEEDING EXPERIMENT

The objects of this experiment are: 1, to compare the results obtained from growing pigs on clover pasture, with those from feeding without pasture; 2, the use of the self-feeder or clover pasture versus pail feeding; 3, the results of light feeding versus ordinary feeding, both with and without clover pasture.

For this test fifty pure-bred Yorkshire pigs ranging in age from seven to eighteen weeks were selected on July 15, 1925. These were divided equally into five lots of ten pigs each.

Lots one and four were housed in portable hog-cabins, in a small yard without grass, while lots two, three and five were given clover pasture, each lot also having a portable hog-cabin as a shelter.

The meal ration was the same for each lot and consisted of two parts of finely ground oats; two parts of middlings; and one part of finely ground barley plus ten per cent of tankage for the first thirty days. During the remainder of the experiment the ration consisted of equal parts of oats, middlings and barley plus ten per cent of tankage.

Lots one and two were fed their grain in normal amounts as a slop in water. Lot three got the grain dry from a self-feeder. Lots four and five were fed in the same manner as lots one and two, only much more lightly at the commencement of the test, the idea being to develop a big growthy pig before any attempt was made to put on fat. Each lot had access to fresh drinking water at all times.

The barley was charged at an average cost of production figure while the oats and middlings were charged at actual market prices. These are as follows:

Oats	per cwt.	$	2 20
Barley	"		1 85
Middlings	"		1 70
Tankage	"		2 75

PIG-FEEDING—CLOVER VERSUS NO CLOVER PASTURE. THE SELF-FEEDER VERSUS PAIL-FEEDING AND LIGHT FEEDING VERSUS ORDINARY FEEDING

Items	Lot 1 No pasture and hand-fed normally	Lot 2 Clover pasture and hand-fed normally	Lot 3 Clover pasture and self-fed	Lot 4 No pasture and hand-fed lightly	Lot 5 Clover pasture and hand-fed lightly
Number of pigs in each lot.....No	10	10	10	10	10
Total weight of 10 pigs on July 15.....lb.	552·0	555·0	542·0	543·0	558·0
Average weight of each pig.....lb.	55·2	55·5	54·2	54·3	55·8
Final weight of ten pigs on Oct. 14....lb.	1,725·0	1,738·0	1,776·0	1,519·0	1,585·0
Average weight of each pig.....lb.	172·5	173·8	177·6	151·9	158·5
Total gain of each lot in 91 days.....lb.	1,173·0	1,183·0	1,234·0	976·0	1,027·0
Average daily gain per lot.....lb.	12·9	13·0	13·6	10·7	11·3
Average daily gain per pig.....lb.	1·29	1·3	1·36	1·07	1·13
Feed consumed					
Ground oats to each lot.....lb.	1,510·0	1,518·0	1,580·0	1,250·0	1,242·0
Middlings to each lot.....lb.	1,510·0	1,518·0	1,580·0	1,250·0	1,242·0
Ground barley to each lot.....lb.	1,270·0	1,278·0	1,340·0	1,060·0	1,052·0
Tankage to each lot.....lb.	429·0	431·0	450·0	356·0	354·0
Total grain ration per lot (tankage included).....lb.	4,719·0	4,745·0	4,950·0	3,916·0	3,890·0
Average grain ration per pig.....lb.	471·9	474·5	495·0	391·6	389·0
Average grain ration per pig per day..lb.	5·19	5·2	5·44	4·3	4·28
Amount of meal per 100 pounds gain..lb.	402·3	401·1	401·1	401·2	378·8
Amount of meal per one pound gain....b.	4·0	4·0	4·0	4·0	3·8
Cost of feed per lot (labour neglected) $	94·19	94 70	98 79	78 15	77 63
Cost of feed to produce 100 pounds gain $	8 03	8 01	8 01	8 01	7 56
Four-year average cost of feed to produce 100 pounds gain, 1922-25..... $	8 26	7 07	7 77	.....	
Two-year average cost of feed to produce 100 pounds gain, 1924-25..... $	7 41	7 26	7 07	7 58	7 25

DEDUCTIONS.—Comparing lots one and two for this year it is found that the use of clover pasture has given an increase in gain of only ten pounds, and a decrease in cost of production of only two cents per 100 pounds. For the two and four-year averages, however, there is a noticeable difference in favour of the lot on pasture.

Lot three on the self-feeder has given the largest gains this year, which has generally been the case, but the feed cost is no lower than that of lot two which was hand-fed.

Comparing lots one and four it is found that the light-fed lot made smaller gains, and the feed cost per 100 pounds was two cents less, in 1925, but for the two-year average, lot one made the cheaper gains. It was also observed that the pigs in lot four would probably be the most desirable type from a bacon standpoint.

In comparing lots two and five it is found that the light-fed lot made the smaller gains, but the feed cost per 100 pounds is less, both for this year and the two-year average.

When lots four and five are compared it is found that lot five made the greater gains and at a lower feed cost per 100 pounds, both this year and in the two-year average. This would seem to indicate that pasture is of greater value to pigs which are fed rather lightly than it is to those which are getting a heavy grain ration.

HORSES

The Station horses number sixteen. Eleven of these are heavy work-horses, either Percheron or Clydesdale grades. Two are pure-bred French-Canadian mares, and the other three consist of a driving horse, a year-old colt and a saddle pony.

The French-Canadian mares were transferred to this Station from the horse-breeding Station at St. Joachim, P.Q.

No experimental work has been conducted in connection with horses.

FIELD HUSBANDRY

ROTATION OF CROPS

In 1922 a comprehensive experiment in crop rotations was commenced. The object of this test was to ascertain the most practical and suitable rotations to use in Ontario's northern clay belt.

The area included represents one acre for each year that the rotation covers; that is, a three-year rotation occupies three acres, a four-year rotation four acres, and so on.

These rotations are located on clay-loam soil which is fairly uniform. A few narrow strips of shallow muck are running crosswise of the rotations and therefore should not affect the accuracy of the test.

The main points on which data are being obtained are as follows:—

1. The value, if any, of a short rotation in building up the fertility of the soil.
2. The effect on the following crop of a sod, one, two and three years old.
3. The yield of hay from first, second and third-year meadows.
4. The yield of sunflowers following clover sod, timothy sod and following grain.
5. The yield of grain after (*a*) sunflowers, (*b*) hay, (*c*) grain.
6. The success of various rotations involving various proportions of the different types of crop.
7. The use of fall or spring grain.
8. The value of a summer-fallow, as compared with a cleaning crop like potatoes or sunflowers.
9. The value of potatoes as a cash-crop.

In connection with 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 on which to compare the rotations and from these figures may be calculated the profits or losses obtained.

Following is a description of each rotation under test. Few comparisons will be made between these rotations until another year, when each rotation will have completed at least one cycle.

ROTATION A (THREE YEARS' DURATION)

First year	Sunflowers
Second year	Oats
Third year	Clover hay

This rotation is short and should be valuable in building up the fertility of the soil. It should also prove efficient in keeping under control weeds of a perennial nature.

The clover sod is manured at the rate of twelve tons to the acre, and fall-ploughed for sunflowers. The land is again fall-ploughed for oats, which are used as a nurse-crop to seed out with.

Only three crops are produced in this rotation. One third of the area is in hoed crops and for these reasons it might not be applicable, on all farms, on a large scale.

ROTATION B (FOUR YEARS' DURATION)

First year	Sunflowers
Second year	Oats
Third year	Clover hay
Fourth year	Timothy hay

As this is a longer rotation than "A" the manure is applied at the rate of sixteen tons to the acre for sunflowers instead of twelve.

This is a very practical rotation and should become widely used on mixed farms.

ROTATION C (FIVE YEAR'S DURATION)

First year	Oats
Second year	Sunflowers
Third year	Barley
Fourth year	Clover hay
Fifth year	Timothy hay

The timothy sod is fall-ploughed for oats. The oat stubble is manured at the rate of twelve tons to the acre and fall-ploughed for sunflowers. After the sunflowers are removed the land is again fall-ploughed for barley which is the nurse-crop used to seed out with. A top dressing of manure, at the rate of eight tons to the acre, is applied after the clover hay is cut. This benefits the timothy meadow and the crop of oats.

The crops represented in this rotation are all well adapted to this part of Ontario. It also gives more grain and a greater variety in the grain produced than rotations "A" or "B".

ROTATION D (SIX YEARS' DURATION)

First year	Potatoes
Second year	Wheat
Third year	Barley
Fourth year	Clover hay
Fifth year	Timothy hay
Sixth year	Timothy hay

The timothy sod is manured at the rate of sixteen tons to the 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 used as the nurse-crop for seeding out with. A top dressing of manure at the rate of eight tons to the acre is given the new seeding after the barley is harvested.

This is a longer type of rotation than any of the others. The crops grown may be disposed of as cash-crops or used on the farm. It may be noted that there are no oats or silage included in this rotation, and these are two very important crops in mixed farming.

ROTATION E (FIVE YEARS' DURATION)

First year	Oats seeded to clover
Second year	Summer-fallow
Third year	Fall wheat
Fourth year	Clover hay
Fifth year	Timothy hay

In this rotation fall wheat is introduced as a grain crop, and the use of the summer-fallow as a cleaning crop instead of a hoed crop.

The timothy sod is fall-ploughed for the oat crop. The clover is allowed to grow until it has become a fair height when it is ploughed under, together with an application of manure at the rate of twelve tons to the 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. A top dressing of manure at the rate of eight tons to the acre is applied after the clover hay is cut the fourth year of the rotation for the benefit of the next two crops.

While this is a five-year rotation only four crops are obtained, as one year is used up by the summer-fallow.

COST OF PRODUCING FARM CROPS

Records on cost of production are kept for all field-crops grown. In arriving at these costs, actual prices are used wherever possible such as the cost of labour, seed, twine, etc. The rent of land is arrived at by multiplying the value of the land by the current rate of interest; the use of machinery is charged at three dollars per acre and is arrived at by figuring the interest on investment, depreciation charges and a percentage for repairs under Eastern Canada conditions. The cost of horse labour is taken at ten cents per hour and is calculated on the basis of the cost of maintenance for one year divided by the number of hours' work done under Eastern Canada conditions.

In calculating the cost per bushel of the various cereal grains the wheat straw is given a value of two dollars per ton and the oat and barley straw each a value of four dollars per ton. That is the value of the straw is deducted from the cost per acre.

The figures which follow are in most cases from field areas which were not included in the rotations or other experimental work.

COST OF PRODUCING SPRING WHEAT

The only spring wheat produced this year was grown on the one acre included in the six-year rotation, consequently it has been used to show the cost of producing this crop.

The seed was sown on May 20, at the rate of two bushels per acre, and harvested on September 21, making 124 days as a growing period.

Some of the seed was drowned out by excessive moisture and the yield was rather low. The quality of the grain was only fair. The cost of production is as follows:—

Total cost per acre	$	34 21
Yield per acre of grain	bush.	14 00
Yield per acre of straw	tons	1 700 lb.
Cost per bushel considering value of straw	$	2 25

OATS FOLLOWING SUNFLOWERS

The figures used in calculating the cost of producing oats in this case are taken from an area of 14 acres of fall-ploughed clay-loam soil which produced a crop of sunflowers in 1924. The seed was sown on May 16 at the rate of three bushels per acre. Considerable damage was suffered from too much rain, so that only a small yield of grain was obtained. The crop was harvested on September 16. The cost of production is as follows:—

Total cost per acre	$	34 48
Yield per acre of grain	bush.	22 00
Yield per acre of straw	tons	1 103 lb.
Cost per bushel considering value of straw	$	1 37

OATS FOLLOWING SOD

The area included in this field was 20.8 acres. The seed was sown on May 28, on fall-ploughed sod at the rate of three bushels per acre. This field also suffered severely from too much rain, so that a very light yield was obtained, and the quality was only fair. The crop was harvested on September 21. The cost of production is as follows:—

Total cost per acre	$	22 50
Yield per acre of grain	bush.	20 8
Yield per acre of straw	tons	1436 lb.
Cost per bushel considering value of straw	$	0 97

It may be noted that the sod field which received no manure produced oats more cheaply than the hoed-crop field which had received manure at the rate of sixteen tons to the acre for sunflowers the previous year. Thirty per cent of this is charged against the oat crop. Of course both these areas suffered too much from excessive rainfall to permit of drawing any definite comparisons between the two on one year's figures.

COST OF PRODUCING BARLEY

The figures on the cost of producing barley are based on twelve acres of O.A.C. No. 21, which was used as a nurse-crop on the grass and clover plots. The seed was sown on June 4, at the rate of one and one-half bushels per acre and while germination was good, considerable damage was suffered by excessive rainfall which reduced the yield very materially. The crop was harvested on September 26, and the quality of grain was fairly good. The cost of production is as follows:—

Total cost per acre	$	33 47
Yield per acre of grain	bush. lb.	23 00
Yield per acre of straw	tons lb.	1880
Cost per bushel of grain considering value of straw	$	1 29

FALL WHEAT

No fall wheat was produced this year. All that was sown killed out in the winter and spring and the land was resown with spring wheat.

COST OF PRODUCING HAY

Although plenty of rainfall was received, the hay crop in 1925 was very light on the large fields. This was due mainly to two causes: first, a large percentage of the red clover was killed out during the spring, and second, the growing season was too cool for good growth even of hay. This was particularly true of the early portion of the growing period when hay ordinarily makes the greatest development. Reasonably good weather prevailed for the curing of the hay which was stored in the barns and stacks in very good condition. Red clover eight pounds, timothy eight pounds, and alsike two pounds form the standard hay mixture sown. Only one-half of the cost of the grass and clover seed is charged to one crop as each seeding is ordinarily cut for two seasons.

In 1925 eighty-seven acres of hay were grown under field conditions and not included in any of the rotations or other experimental work. The cost of production is as follows:—

Total cost per acre	$	15 00
Yield per acre	lb.	1,208
Cost per ton	$	24 83

COST OF PRODUCING SUNFLOWERS

Fourteen acres were grown in 1925. The seed was sown on May 27 on fall-ploughed timothy sod which was manured at the rate of sixteen tons to the acre, during the winter.

The ordinary grain-drill was used to sow the seed in rows thirty inches apart and the plants were thinned to about six inches apart in the row. The seed germinated well; but was afterwards partly drowned out. In fact, the land was much too wet during a large part of the growing season for best results. The crop was harvested during the week of September 14. The cost of production is as follows:—

Total cost per acre	$	48 17
Yield per acre	tons lb.	4 789
Cost per ton	$	10 97

COST OF PRODUCING OATS, PEAS AND VETCH MIXTURE

The area from which these data have been secured is an 18-acre block of land, which was producing the second crop. The land was fall-ploughed; but was so wet in the spring that it could not be seeded until June 17. The mixture used was two bushels of oats, one bushel of peas and one-half bushel of common vetch per acre. The ground was so wet that a proper seedbed could not be prepared and growth was very poor even after the seed was sown. In fact the crop was the lightest in the history of the Station. The crop was ensiled during the week of September 7. The cost of production is as follows:—

Total cost per acre	$	27 55
	tons	lb.
Yield per acre	1	1883
Cost per ton	$	14 19

POTATOES

Owing to excessive rainfall which prevented the planting of the field-crop potatoes until it was much too late, and also kept the ground too wet for growth afterwards, the potato crop was almost a complete failure in 1925. Consequently it has not been considered advisable to report any cost of production figures as these would not be of any value.

CULTURAL EXPERIMENTS

DATE OF SEEDING FALL RYE

The object of this experiment is to determine what date or dates of seeding will give the best results. In 1924 the seed was sown on six different dates at intervals of seven days commencing on August 18, in quadruplicate one-fortieth acre plots at the rate of one and one-half bushels per acre. Common fall rye was the variety used. The results obtained are as follows:—

DATE OF SEEDING FALL RYE

	Date sown											
	Aug. 18		Aug. 25		Sept. 1		Sept. 8		Sept. 15		Sept. 22	
	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.
Yield per acre	40	53	35	0	29	3	25	20	25	20	23	52

The figures in this table indicate that fall rye will give larger yields when seeded early than when seeded late.

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 1925 twelve different rates of seeding were under test. The seed was sown on May 28, in quadruplicate one-fortieth-acre plots, on fall-ploughed sod which was manured at the rate of sixteen tons to the acre, previous to seeding. The season was much too wet for best results and the crop was rather light. The results obtained are as follows:—

RATE OF SEEDING SUNFLOWERS

Plot No.	Distance between rows	Distance between plants in rows	Yield per acre			
			Green weight 1925	Dry weight 1925	Average green weight 1924-25	Average dry weight 1924-25
	inch	inch	tons lb.	tons lb.	tons lb.	tons lb.
1	24	6	5 1,600	0 1,699	8 230	1 316
2	24	12	6 1,650	1 24	7 255	0 1,949
3	24	18	6 910	0 1,816	6 1,460	0 1,808
4	30	6	6 1,220	0 1,971	8 1,015	1 256
5	30	12	7 140	1 181	7 1,160	1 183
6	30	18	5 1,330	0 1,799	6 705	0 1,800
7	36	6	6 930	1 79	7 1,410	1 77
8	36	12	6 950	0 1,931	6 1,990	0 1,878
9	36	18	4 1,840	0 1,582	5 1,370	0 1,633
10	42	6	5 550	0 1,673	8 145	1 178
11	42	12	5 930	0 1,723	6 1,385	0 1,822
12	42	18	5 340	0 1,588	5 1,025	0 1,490

The results in this table would seem to indicate that the rate of seeding sunflowers may be varied considerably without materially affecting the yields obtained. In fact it is very difficult to select any rate or rates of seeding that have consistently given superior results. It may be noted, however, that where the rows are a considerable distance apart, 36 or 42 inches, and the plants in the row are also thinly spaced, at 18 inches, there seems to be a tendency for the yield to be less than where either the rows or the plants within the row are closer together. That is, it appears that about equal results will be obtained with the rows wide apart and the plants close together, and when the rows are close together, and the plants widely spaced; but if the distance is too great each way some reduction in yield is noted. A good average distance between the rows, of 30 to 36 inches, with the plants 6 to 12 inches apart in the row would seem to be a suitable spacing to use as this permits ease of seeding, cultivation and harvesting.

In order to make possible a direct comparison between the different distances between the rows and also between the plants at different distances within the row, the following table has been prepared.

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

Distance	Yield per acre			
	Green weight 1925	Dry weight 1925	Green weight 1924-25	Dry weight 1924-25
	tons lb.	tons lb.	tons lb.	tons lb.
Rows 24 inches apart	6 720	0 1,846	7 649	1 24
Rows 30 inches apart	6 897	0 1,984	7 960	1 80
Rows 36 inches apart	5 1,907	0 1,864	6 1,590	0 1,863
Rows 42 inches apart	5 607	0 1,661	6 1,519	0 1,830
Plants 6 inches apart	6 75	0 1,856	8 200	1 207
Plants 12 inches apart	6 918	0 1,965	7 198	0 1,958
Plants 18 inches apart	5 1,105	0 1,696	6 140	0 1,683

This table also indicates that there is a tendency for the yields to lessen as the rows are placed wider apart or as the plants are more widely spaced within the row, although the latter factor seems to have a greater effect than the former.

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 1925 twenty different mixtures and rates of seeding were under test. All plots were seeded in quadruplicate one-fortieth-acre plots, on fall-ploughed clay loam soil which had been manured at the rate of sixteen tons to the acre previous to ploughing. The sunflowers were seeded on May 20, the O. P. V. on June 1, and the corn on June 23. The corn was harvested on September 9, the O. P. V. on September 10, and the sunflowers on September 15. Mammoth Russian sunflowers, Northwestern Dent corn, No. 72 oats, Arthur peas and common vetch are the varieties used. A few of the plots were drowned out so that they were not suitable to use for experimental purposes; however, most of them came along well and gave fairly good yields. The results obtained 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 1925		Dry weight 1925		Average green weight 1924-25		Average dry weight 1924-25	
inch	inch	lb.	lb.	lb.	lb.	tons	lb.	tons	lb.	tons	lb.	tons	lb.
24						11	300	1	1,673	16	150	2	78
30						11	1,300	1	1,631	15	1,855	1	1,589
36						11	340	1	1,544	15	380	1	1,915
42						10	1,005	1	1,330	12	1,635	1	1,219
	24					2	1,680	0	714	4	1,085	0	958
	30					2	1,560	0	752	3	1,240	0	808
	36					2	1,226	0	693	3	613	0	760
	42					2	867	0	647	2	1,579	0	641
		34	60			10	40	1	1,799	9	1,145	2	78
		51	60			10	400	1	1,714	9	915	1	1,940
		68	60			10	107	1	1,937	9	854	2	426
		34	60	28		11	1,387	2	37	11	454	2	172
		51	60	28		12	427	1	1,985	11	1,144	2	468
		68	60	28		12	1,067	1	1,843	11	79	1	1,910
		34	60		10	10	1,267	1	1,533	9	1,199	1	1,991
		51	60		10	10	1,387	1	1,916	9	994	2	48
		68	60		10	10	133	1	1,992	9	182	2	71
		34	60	28	10	10	1,653	1	1,836	10	1,697	2	44
		51	60	28	10	10	1,987	1	1,498	10	1,894	2	286
		68	60	28	10	11	747	1	1,961	11	684	2	778

The two-year average figures in this table show some slight advantage for rows twenty-four inches apart for both sunflowers and corn; but this distance is too close for convenient cultivation. For O.P.V. there does not appear to be any significant difference in yield caused by the different mixtures. In fact it is remarkable how uniform the yields run from all the rates of seeding used.

DATES 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 thirty inches apart and the plants were thinned to six inches apart in the row, while the oats, peas and vetch were sown at the rate of two bushels of oats, one bushel of peas, and one-half bushel of vetch per acre. In 1925, the seed was sown on six different dates at intervals of seven days commencing on May 16, in quadruplicate one-fortieth-acre plots, on fall-ploughed, clay-loam soil which was

manured at the rate of sixteen tons to the acre previous to ploughing. Most of the plots did fairly well and gave good yields. The results obtained are as follows:—

DATE OF SEEDING ENSILAGE CROPS

Crop	Date of seeding 1925	Yield per acre							
		Green weight 1925		Dry weight 1925		Average green weight 1924-25		Average dry weight 1924-25	
		tons	lb.	tons	lb.	tons	lb.	tons	lb.
Sunflowers	May 16	13	1,453	2	174	17	1,272	2	435
Sunflowers	May 23	14	293	2	379	17	1,497	2	437
Sunflowers	May 30	14	1,040	2	305	17	1,515	2	528
Sunflowers	June 6	13	160	1	1,373	17	765	1	1,992
Sunflowers	June 13	12	860	1	1,268	14	1,625	1	1,476
Sunflowers	June 20	13	760	1	1,732	12	1,930	1	1,073
O.P.V.	May 16	10	680	2	1,352	11	1,255	2	1,335
O.P.V.	May 23	12	1,910	2	1,656	13	315	2	1,608
O.P.V.	May 30	12	1,693	2	1,207	12	1,797	2	1,277
O.P.V.	June 6	11	800	2	620	12	1,435	2	847
O.P.V.	June 13	10	1,800	1	1,945	12	715	2	249
O.P.V.	June 20	11	520	2	364	12	775	2	405
Corn	May 16	3	1,240	0	824	2	1,600	0	609
Corn	May 23	4	120	0	1,012	2	1,955	0	695
Corn	May 30	4	1,560	0	1,183	4	1,395	0	1,040
Corn	June 6	4	1,360	0	1,170	4	1,970	0	1,125
Corn	June 13	4	40	0	910	3	1,760	0	619
Corn	June 20	4	1,800	0	1,263	2	1,720	0	730

The figures in this table indicate that there is a tendency for the earlier seeding of sunflowers and O.P.V. to give the best results, while corn gives a greater yield when sown about the last of May or the first of June. Sunflowers and O.P.V., however, apparently, may be sown over quite a long period without materially affecting the yields obtained.

ENSILAGE AND ROOT EXPERIMENT

The objects of this experiment are to compare the yields of sunflowers, corn, and a mixture of oats, peas and vetch for ensilage with a root crop of turnips, and also to compare the effect of each of these crops on the following crop.

This experiment is operated on a four-year rotation as follows:—

First year.....One-quarter area in each of roots, sunflowers, corn and O.P.V.
Second year.....Oats.
Third year.....Clover hay.
Fourth year.....Timothy hay.

The ensilage and root crops are grown on fall-ploughed sod which is manured at the rate of sixteen tons to the acre. The land is again fall-ploughed for the oat crop the next year which is used as the nurse-crop for the grass and clover.

In 1925 owing to excessive rainfall all four crops were practically a complete failure. The sunflowers, corn, and roots were entirely drowned out while the O.P.V. gave a yield of only 3,935 pounds per acre of green material.

The four acres which were in silage and hoed crops in 1924, were seeded to Alaska oats on May 30, 1925. They were harvested on August 31. The results obtained are as follows:—

YIELDS OF ALASKA OATS FOLLOWING O.P.V., SUNFLOWERS, CORN AND TURNIPS

Previous Crop	Yield of Oats per acre 1925	
	bush.	lb.
O.P.V.	12	4
Sunflowers	20	10
Corn	24	2
Turnips	39	14

In 1924 the O.P.V. produced a much greater yield of dry matter than did any of the other three. In fact no yield was obtained from the area in corn. However, the difference this year in yield of Alaska oats is too great to be caused entirely by the previous crop. That is, the year was so abnormal in temperature and rainfall, that no conclusions should be drawn from the one season's figures.

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 as follows:—

First year	Oats seeded to sweet clover.
Second year	Sweet clover ploughed down and summer-fallowed.
Third year	Barley seeded to timothy and clover.
Fourth year	Clover hay.
Fifth year	Timothy hay.

The land is fall-ploughed for the oat crop. When the sweet clover is a fair height it is ploughed under after which the soil is cultivated occasionally throughout the remainder of the season. This cultivation controls the weeds, conserves the moisture and assists in decaying the green crop. The soil is in excellent condition for barley, and seeding out to grass and clover.

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, and is located on virgin clay-loam soil under the following rotation:—

First year	Oats seeded to sweet clover.
Second year	Sweet clover ploughed down, buckwheat seeded and one-half acre of that ploughed down, while the other half is cut for grain if this is possible.
Third year	Barley seeded to timothy and clover.
Fourth year	Clover hay.
Fifth year	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. This prepares the land for seeding out to grass and clover the next year, using barley as a nurse-crop.

No Green Manure Crop Ploughed Down.

This experiment may be compared with the above two, as no green manure crop is ploughed down, but a legume grain is used to supplement the clover crop in building up the soil. It was commenced in 1922 under the following rotation:—

First year	Peas.
Second year	Oats.
Third year	Clover hay.
Fourth year	Timothy hay.

The timothy sod is fall-ploughed for peas. After the pea crop is harvested the land is again fall-ploughed in preparation for seeding out to grass and clover using oats as a nurse-crop.

Effect of Growing Non-Legumes, Legumes, and of Ploughing under Green Manure

This experiment makes possible the comparison of oats and barley in the rotation with peas and oats. It may also be compared with the rotations where green manure is ploughed down. This experiment was commenced in 1922 under the following rotation:

First year	Oats.
Second year	Barley.
Third year	Clover hay.
Fourth year	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 used as the nurse-crop for the grass and clover.

FARM MANURE EXPERIMENT

The object of this experiment is to compare the effect of an application of manure at the rate of sixteen tons to the acre once in the rotation, with green manure ploughed down and with no manure applied of any kind. This experiment was commenced in 1922 under the following rotation:—

First year	Oats.
Second year	Barley.
Third year	Clover hay.
Fourth year	Timothy hay.

The land is fall-ploughed and afterwards manured at the rate of sixteen tons to the acre for oats. After the oats are harvested it is again fall-ploughed and seeded out to grass and clover the following spring using barley as a nurse-crop.

LIME EXPERIMENT

The object of this experiment is to determine the results obtained from the application of two tons of ground limestone to the acre during the second year of the rotation. This experiment was commenced in 1922, under the following rotation:—

First year	Oats (disk in 16 tons of manure per acre).
Second year	Barley (applying 2 tons of ground limestone).
Third year	Clover hay.
Fourth year	Timothy hay.

The operation of this rotation is exactly the same as that of the last one discussed with the exception that the ground limestone is applied at the rate of two tons to the acre in the second year.

DRAINAGE EXPERIMENT

The object of this experiment is to compare the results obtained from tile-drained land and land which is not tile drained. For this test twenty 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 drains, while the other ten acres were left undrained.

The whole area is under the following rotation:—

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

In 1925 the whole area was in hay and the statement covering the cost of production on the drained and undrained areas is as follows:—

FIRST YEAR MEADOW

Items	Drained	Undrained
Total cost per acre	$26 23	$23 39
Yield per acre	tons lb. 1 1,522	tons lb. 1 920
Cost per ton	$14 89	$16 12

The past year was a particularly wet one and it may be noted that the tile-drained land produced the hay more cheaply than did the undrained land.

SURFACE DRAINAGE EXPERIMENT

The object of this experiment is to compare the results obtained from different widths of lands. The different widths under test are 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 was established in 1922 under the following rotation:—

First year	Oats.
Second year	Barley.
Third year	Clover hay.
Fourth year	Timothy.

The results obtained in 1925 from the crop of clover hay are as follows:—

SURFACE DRAINAGE EXPERIMENT—1925 RESULTS

Width of lands	Yield per acre	
	tons	lb.
Lands 18 feet in width	..	1,645
Lands 24 feet in width	..	1,978
Lands 36 feet in width	..	1,543
Lands 48 feet in width	1	380

The results from this test are more or less conflicting and no conclusions can be drawn until the test is conducted for a longer period.

HORTICULTURE

The vegetables were not planted until late in May in 1925, owing to cool, backward weather, and too much rain. Shortly after seeding, on June 5 and 6, a heavy rainfall of 2.95 inches drowned out a considerable amount of the seed, so that in several cases poor results were obtained. Cutworms were also very bad, but these were soon checked by applications of poison-bran. Strawberries were poor, but the raspberries and currants were fairly good. Little damage was suffered from frost, but the season was too cool and wet for best results with vegetables.

ORCHARD

Five of the trees in the young orchard which was set out in 1918 bore fruit in 1925. The majority of the trees developed well during the season and few were winter-killed.

It has been found advisable to develop low-set bushy trees with short trunks, rather than a taller type, as this affords extra protection during the winter months from snow.

SMALL FRUITS

RED CURRANTS: The seven varieties which were set out in 1920, in rows six feet apart and five feet between the bushes in the row, all bore fruit. For the four-year average the four leading varieties are, Victoria, Red Grape, London Red and Long Bunch Holland, which have given average yields of 5 pounds, 4 pounds 6 ounces, 3 pounds, 13 ounces and 3 pounds 9 ounces each respectively from six bushes.

WHITE CURRANTS: Only two varieties have been under test. These were set out in 1920 in rows six feet apart, and five feet between the bushes in the row. The yields from these have always been very light. In 1925 White Grape gave 2 pounds and White Sherry 1 pound 5 ounces.

BLACK CURRANTS.—Fourteen varieties were planted in 1920 in a similar manner to the red and white currants. These have been bearing since 1922. The average yields for the five leading varieties for the last four years are as follows: Saunders 18 pounds 8 ounces, Climax 16 pounds 10 ounces, Eagle 15 pounds 8 ounces, Ontario 12 pounds 15 ounces, and Kerry 12 pounds 7 ounces, from six bushes. In 1925 the yields from these same varieties are 23 pounds 8 ounces, 18 pounds 4 ounces, 37 pounds, 19 pounds 8 ounces, and 25 pounds 8 ounces respectively.

GOOSEBERRIES.—Fifteen varieties were set out in 1920, in rows six feet apart and five feet between the bushes in the row. Some of these have borne fruit in past years, but none was obtained in 1925.

RASPBERRIES.—Eight varieties were set out in 1920 in rows six feet apart and the canes three feet apart in the row. These have been yielding fruit for the last five years. The standing and yield of the eight varieties on a five-year average from a thirty-foot row are as follows: Newman 23, 9 pounds 12 ounces; Herbert, 9 pounds 10 ounces; Early June, 8 pounds 13 ounces; Brighton, 8 pounds 7 ounces; King, 8 pounds 4 ounces; St. Regis, 7 pounds 8 ounces; Cuthbert, 6 pounds 14 ounces; and Sunbeam, 6 pounds 4 ounces.

VEGETABLES

VARIETY TESTS

BROAD BEAN.—Seventeen varieties were under test. The seed was planted on June 2, in thirty-foot rows, which were three feet apart, the plants being three inches apart in the row. The five highest-yielding varieties in 1925,

together with the yields obtained in quarts are as follows: Cluster, 19.5; Bunyard Exhibition, 18.5; Long Pod Aquadulce, 16.5; Broad Windsor Taylor, 16; and Windsor Green, 16. The broad bean grows well in this district, but is not in as good demand as other sorts.

BEET.—Eleven varieties were under test. The seed was planted on May 30, in thirty-foot rows, which were 18 inches apart, and the plants were thinned to two inches apart in the row. In 1925 the four highest-yielding varieties together with the yields obtained are as follows: Detroit Dark Red, 11 pounds; Cardinal Globe, 9.5 pounds; Crosby Egyptian, 8.5 pounds; Black Red Ball, 8.5 pounds. The quality of these was also good which is a very important feature with table beets.

CARROT.—Nine varieties were under test. The seed was sown in drills thirty feet in length and eighteen inches apart on May 30, and the plants were thinned to one and one-half inches apart in the row. The four highest-yielding varieties in 1925, together with the yields obtained are as follows: Early Scarlet Horn, 19 pounds; Nantes Half Long, 18.5 pounds; Garden Gem, 11.5 pounds; and Early Nantes, 11.5 pounds.

CELERY.—Nine varieties were under test. The seed was sown in the hotbed on April 20, and the plants were transplanted to the garden on June 13. The rows were thirty feet in length and four feet apart and the plants were set six inches apart in the row. The four highest-yielding varieties in 1925 together with the yields obtained are as follows: Evans Triumph, 48.5 pounds; Giant Pascal, 41 pounds; French Success, 39.5 pounds; and Winter Queen, 32.5 pounds. These are also all very good in crispness and quality which is a very important feature in celery.

ENDIVE.—One variety, Fine Green Curled, was under test. The seed was sown on May 30, in a thirty-foot row and the plants were thinned to six inches apart in the row. A yield of 21 pounds was obtained.

KOHL RABI.—Two varieties were under test. The seed was sown on May 30, in rows which were thirty feet in length and the plants were thinned to eight inches apart in the row. White Vienna gave a yield of 4.5 pounds and Purple Vienna 4 pounds.

KALE OR BORECOLE.—Two varieties were under test. The seed was sown in the hotbed on May 8, and the plants set out in the garden on June 17, in thirty-foot rows, with the plants twenty-four inches apart in the row. The Dwarf Green Curled gave a yield of 37.5 pounds and Tall Scotch 32.5 pounds per thirty-foot row.

LEEKS.—Two varieties were under test. The seed was sown in the hotbed on May 8, and transplanted to the garden on July 14, in thirty-foot rows, the plants being set six inches apart in the row. The Carentan variety gave a yield of 9 pounds and Musselburgh 8.5 pounds.

LETTUCE.—Thirteen varieties were under test. The seed was sown on June 4, in drills which were thirty feet in length and fifteen inches apart. The plants were thinned to six inches apart in the row. The average yield from the thirteen varieties was 26.7 pounds from a thirty-foot row. With lettuce cripsness and quality are of even greater importance than large yields. Grand Rapids, Salamander, Iceberg, New York, Earliest Wayahead, and All Seasons are among the best quality varieties, that have been tried.

ONIONS.—Eleven varieties were under test. The seed was sown on June 4, in drill which were thirty feet in length and fifteen inches apart. The plants were thinned to one inch apart in the row. The five highest-yielding varieties together with the yields obtained in pounds are as follows: Southport White Globe, 4.5; Giant Yellow Prizetaker, 4.25; Yellow Globe Danvers, 4; Southport Red Globe, 4; and Australian Brown, 4.

Two varieties grown from sets were under test. These were set out May 19, in rows fifteen inches apart and the sets were placed two inches apart in the row. Yellow Globe Danvers gave a yield of 16 pounds and Large Red Wethersfield 7.5 pounds per thirty-foot row.

PARSNIP.—Three varieties were under test. The seed was sown on May 30, in rows which were thirty feet in length and thirty inches apart, and the plants were thinned to two inches apart in the row. The yields obtained in pounds are as follows: Elcombe Improved Hollow Crown, 12; Hollow Crown, 11.5; and Guernsey XXX, 8, per thirty-foot row.

GARDEN PEAS.—Ten varieties were under test. The seed was sown on June 2, in rows which were thirty feet in length and three feet apart. The plants were one inch apart in the row. The yields obtained in quarts from the five highest-yielding varieties are as follows: McLean Advancer, 27.5; Stratagem, 21.5; Gradus X American Wonder, 17; Thomas Laxton, 14; and Laxtonian 13.75, per thirty-foot row.

POTATO.—Eleven varieties and strains were under test. The tubers were planted on June 20, in quadruplicate one-eightieth-acre plots, the sets being placed fifteen inches apart in the row. The "B" and "C" plots were both drowned out so that the results as presented are from duplicate plots only. Even these were so badly affected by too much rain that the yields are far below normal. The results obtained are as follows:—

VARIETY TEST OF POTATOES

Variety	Original source of seed	Yield per acre							
		Marketable 1925		Unmarketable 1925		Two-year average			
						Marketable		Unmarketable	
		bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.
Irish Cobbler	Dorion, Ont	145	20	28	00	196	50	30	40
Irish Cobbler	Hillsburg, Ont	124	00	20	00	179	30	32	00
Green Mountain	Fredericton, N.B	124	00	36	00	171	30	36	40
Green Mountain	Searchmont, Ont	121	20	36	00	155	10	38	00
Irish Cobbler	Acton, Ont	121	20	38	40	148	00	43	20
Carman No. 3	Hamilton, Ont	120	00	14	40	188	00	20	10
Early Ohio	Winnipeg, Man	110	40	14	40	125	7	18	13
Irish Cobbler	N.B	109	20	20	00	168	40	34	10
Bovee	Winnipeg, Man	100	00	20	00	106	20	16	40
Dooley	Bronte, Ont	97	20	21	20	178	00	22	50
Davies Warrior	Actonvale, P.Q	96	00	21	20	151	10	19	40

PUMPKIN.—Two varieties were under test. The seed was sown in the hot-bed on May 8, and the plants were transplanted to the garden on July 10, in hills ten feet apart. Connecticut Field gave a yield of 17 pounds and Small Sugar 14.5 pounds from three hills.

RADISH.—Five varieties were under test. The seed was sown on June 4, in drills which were thirty feet in length and fifteen inches apart. The yields obtained in pounds are as follows: French Breakfast, 25.5; Scarlet oval, 20; Scarlet Turnip White Tip, 19; White Icicle, 17; and Chartier, 16.

SPINACH.—Four varieties were under test. The seed was sown on June 4, in thirty-foot rows which were fifteen inches apart. The yields obtained in pounds are as follows: Victoria, 14; Viroflay, 11.5; Long Standing, 9; and Broad Flanders, 8.5.

SALSIFY.—Two varieties were under test. The seed was sown on June 4, in thirty-foot rows, which were fifteen inches apart. The plants were thinned

to one and one-half inches apart in the row. Mammoth Sandwich Island gave a yield of 13 pounds and Long White 8 pounds, per thirty-foot row.

SWISS CHARD.—One variety, Silver Leaf White, was under test. The seed was sown on May 30, in a thirty-foot row. The plants were thinned to three inches apart in the row. A yield of 14.5 pounds was obtained.

SQUASH.—Two varieties were under test. The seed was sown in the hot-bed on May 8, and the plants were transplanted to the garden on July 10, in hills ten feet apart. Kitchenette gave a yield of 12 pounds and English Vegetable Marrow 10 pounds, from three hills.

TURNIP.—Five varieties were under test. The seed was sown on June 4, in drills which were thirty feet in length and fifteen inches apart. The plants were thinned to two inches apart in the row. The yields obtained in pounds are as follows: Milan Purple Top, 14; Early Purple Top Milan, 13.5; Red Top Strap Leaf, 13; Golden Ball, 10. The Champion Swede variety was destroyed by cutworms.

CULTURAL EXPERIMENTS WITH VEGETABLES

RATE OF PLANTING PEAS.—The object of this experiment is to compare the results obtained from planting peas, one, two, and three inches apart in the row. Three varieties were used. The seed was planted on May 28, in rows which were thirty feet in length and thirty inches apart. The results obtained are as follows:—

RATE OF PLANTING PEAS

Variety	Yield per thirty-foot row					
	One inch 1925	Two inches 1925	Three inches 1925	Three year average one inch	Three year average two inches	Three year average three inches
	quarts	quarts	quarts	quarts	quarts	quarts
English Wonder	17·8	16·0	14·3	11·1	9·0	7·5
Thomas Laxton	17·0	19·5	15·0	10·6	10·5	7·5
Stratagem	21·5	19·0	22·0	.....	.....	

The Stratagem failed to germinate in 1924 and therefore is not included in the three-year average.

DATE OF SEEDING BEETS.—The object of this experiment is to compare the results obtained from beets planted at different dates, at intervals of ten days beginning as early as possible and continuing until it is thought to be too late. One variety has been used and in 1925 the first date of seeding was on May 29. The seed was sown in rows which were thirty feet in length and fifteen inches apart. The plants were thinned to two inches apart in the row. The results obtained are as follows:—

DATE OF SEEDING BEETS

Variety	Date seeded 1925	Yield per thirty-foot row			
		1925		Three-year average	
		lbs.	oz.	lb.	oz.
Detroit Dark Red	May 29	7	0	23	10
Detroit Dark Red	June 8	4	8	17	10
Detroit Dark Red	June 18	3	12	14	14
Detroit Dark Red	June 27	1	8	11	7

NOTE.—No results were obtained from seed sown on July 8.

DATE OF SEEDING CARROTS.—The object of this experiment is to compare the results obtained from carrots planted at different dates, at intervals of ten days, commencing as early as possible and continuing until five dates were seeded. One variety was used, and in 1925 the first date of seeding was on May 29. The seed was sown in rows which were thirty feet in length and fifteen inches apart, and the plants were thinned to one and one-half inches apart in the row. The results obtained are as follows:—

DATE OF SEEDING CARROTS

Variety	Date seeded 1925	Yield per thirty-foot row			
		1925		Three-year average	
		lb.	oz.	lb.	oz.
Chantenay	May 29	12	0	29	13
Chantenay	June 8	5	8	25	0
Chantenay	June 18	4	8	12	5
Chantenay	June 27	4	0	5	9
Chantenay	July 8	3	8	..	..

DATE OF SEEDING PARSNIPS.—The object of this experiment is to compare the results obtained from different dates of planting, at intervals of ten days commencing as early as possible and continuing until five plantations are under test. One variety was used, and the first date of planting in 1925 was May 29. The seed was sown in rows which were thirty feet in length and fifteen inches apart, and the plants were thinned to two inches apart in the row. The results obtained are as follows:—

DATE OF SEEDING PARSNIPS

Variety	Date planted 1925	Yield from thirty-foot row			
		1925		Three-year average	
		lb.	oz.	lb.	oz.
Hollow Crown	May 29	17	8	27	5
Hollow Crown	June 8	5	0	11	12
Hollow Crown	June 18	4	8	6	12
Hollow Crown	June 27	2	8		
Hollow Crown	July 8	2	8		

METHODS OF BLANCHING CELERY.—The object of this experiment is to compare the results obtained in earliness, crispness, blanching, flavour and yield from the different methods of blanching. Golden Self Blanching was the variety used. In 1925, the seed was sown in the greenhouse on April 20, and the plants were transplanted to the garden on June 13. The rows were fifteen feet in length and four feet apart, and the plants were set six inches apart in the row, with the exception of one planting which was put in a bed six feet square with the plants six inches apart each way. The results obtained during the last three years would seem to indicate that while celery may be fairly well blanched by either ready roofing, boards, earthing up on the level or in trenches, yet the latter method gives as large yields, with much the best quality. The celery obtained from the six-foot bed has never been of any commercial value.

SPROUTING EXPERIMENT WITH POTATOES.—The object of this experiment is to compare the results obtained from potatoes which are sprouted previous to planting by being exposed for six weeks to subdued light at a temperature of between 40 and 50 degrees Fahrenheit, with potatoes kept as dormant as possible in a cool, dark root-cellar. Two varieties, an early and a main-crop variety, were used in this test. The seed was planted in quadruplicate rows, which were sixty-six feet in length and thirty inches apart, and the tubers were set one foot apart in the row. In 1925 they were planted on May 30 and harvested on October 2, the results obtained are as follows:—

SPROUTING EXPERIMENT WITH POTATOES

Variety	How treated	Yield per acre							
		Marketable 1925		Unmarketable 1925		Two-year average marketable		Two-year average unmarketable	
		bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.
Irish Cobbler	Sprouted	224	24	15	24	273	21	31	21
Irish Cobbler	Unsprouted	199	6	20	54	248	3	36	51
Green Mountain	Sprouted	260	42	58	18	319	0	56	56
Green Mountain	Unsprouted	224	24	53	54	293	42	51	42

SPRAYING EXPERIMENT WITH POTATOES.—The object of this experiment is to compare the results obtained from sprayed and unsprayed potatoes. The spray used was the standard Bordeaux mixture and the first spraying in 1925 was done on July 25. The spraying was done at intervals of seven days until seven sprayings were applied. The variety used was Irish Cobbler which was planted on June 20, in quadruplicate one-eightieth-acre plots, and harvested on September 30. The results obtained are as follows:—

SPRAYING EXPERIMENT WITH POTATOES

Treatment	Yield per acre							
	Marketable 1925		Unmarketable 1925		Two-year average marketable		Two-year average unmarketable	
	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.
Sprayed	143	00	20	00	208	11	28	30
Unsprayed	120	20	21	40	195	20	29	20

DATES OF PLANTING EXPERIMENT WITH POTATOES.—The object of this experiment is to compare the results obtained 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 1925, was on May 18. The seed was planted in quadruplicate sixty-six-foot rows, and the tubers were set one foot apart in the row. The results obtained are as follows:—

DATE OF PLANTING EXPERIMENT WITH POTATOES

Variety	Date planted 1925	Date ready for use 1925	Yield per acre							
			Marketable 1925		Unmarketable 1925		Two-year average marketable		Two-year average unmarketable	
			bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.
Irish Cobbler	May 18	Aug. 4	171	36	30	48	242	33	35	12
Irish Cobbler	June 1	" 15	173	48	29	42	252	27	42	54
Irish Cobbler	" 15	" 28	172	42	38	30	224	57	48	57
Irish Cobbler	" 29	Sept. 27	168	18	37	24	171	3	46	45
Irish Cobbler	July 13	" 27	117	42	20	54	89	6	27	30
Green Mountain	May 18	Aug. 15	173	48	40	42	251	21	40	42
Green Mountain	June 1	" 28	205	42	53	54	268	57	47	51
Green Mountain	" 15	Sept. 6	191	24	63	48	223	51	57	45
Green Mountain	" 29	" 27	170	30	45	6	174	21	45	6
Green Mountain	July 13	" 27	85	48	35	12	72	36	36	18

FALL VERSUS SPRING SEEDING OF VEGETABLES.—The object of this experiment is to compare the results obtained 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 November 3, 1924 and on May 19, 1925. The results obtained are as follows:—

FALL VERSUS SPRING SEEDING OF VEGETABLES

Crop	Variety	Date ready for use		Yield per thirty-foot row					
		Fall seeding	Spring seeding	Fall seeding		Spring seeding		Two-year average fall seeding		Two-year average spring seeding	
				lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.
Beet	Detroit Dark Red	.....	Sept. 6	.....		11	0	3	8	15	10
Carrot	Chantenay	Aug. 15	Aug. 26	14	0	16	0	21	0	16	8
Cabbage	Copenhagen Market	.....	.....	.....		.....		.....		0	11
Lettuce	Grand Rapids	July 16	July 23	37	0	30	0	28	0	26	8
Onion	Red Wethersfield	Aug. 1	Aug. 10	9	0	7	0	5	0	6	12
Radish	Scarlet White Tip	June 20	June 27	4	0	22	0	4	0	20	0
Turnip	Purple Milan	.....	Aug. 6	.....		11	0	.....		11	14

From the results it would appear that lettuce, onions and carrots do equally well, if not better when sown in the fall.

FLOWERS

In 1925 fifty-one distinct types or kinds of annual flowers were under test. Many of these were represented by several varieties and colours. Twenty-five were sown in the greenhouse on April 23, and these were set out in the borders on July 2. The other twenty-six were sown in the borders and flower gardens direct on June 20, with the exception of sweet peas which were seeded on June 18. Although the season was somewhat cool, the abundance of moisture caused the plants to produce magnificent flowers, so that there was a continuity of attractive bloom from early summer until late autumn. Flowers of this nature add very materially to the beauty of the grounds and receive favourable comments from visitors to the Station.

In the autumn of 1921 a number of the different sorts of bulbs were set out in the various borders. A further supply has been planted each year, and it is remarkable to see the magnificent bloom that these have been producing in the early spring, in some cases before the snow is off the ground.

TREES, SHRUBS AND LAWNS

The trees and shrubs which have been planted in various locations around the grounds, grew well during the past year. A great improvement can be effected in the appearance of a place by the judicious planting of a number of the more hardy specimens of trees and shrubs.

The laurel-leaved willow and Russian poplar have proven very valuable where quick growth is desired. For hedges, the Caragana and laurel-leaved willow are both giving excellent results. For lawn decoration and ornamental clumps the various species and varieties of lilacs and Caragana, Japanese rose, Japanese barberry, Missouri or Golden currant, Tartarian honeysuckle, *Viburnum lantana,* and Mountain ash have all proven hardy and desirable sorts to use in this district.

The permanent lawns have been established by seeding down with a mixture of Kentucky blue grass and white Dutch clover.

CEREALS

The spring of 1925 was cold and backward, so that no seeding could be done on the cereal plots until May 14. This was the same date as in 1924, but nearly two weeks later than in 1923. May had a mean temperature, which was 6 degrees below the average for a period of eight years and the sunshine was 79.9 hours less than the average amount received.

The total precipitation for the five growing months was 18.06 inches, which was 4.86 inches above the eight-year average, and while hay and some of the other forage crops did fairly well, it was much too wet for best results with grain crops, as in several instances the seed was drowned out entirely.

SPRING WHEAT

Three varieties of spring wheat were under test in 1925. The seed was sown on May 14, in quadruplicate, one-fortieth-acre plots, at the rate of two bushels per acre. However, owing to extreme wet and cold weather, it was found necessary to reseed these plots, and this was done on June 10, which fact reduced the yield materially and also lowered the quality of the grain. The results obtained 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 to mature six-year average, 1920-25	Yield of grain per acre six-year average, 1920-25
			inch		bush. lb.		bush. lb.
Huron, Ottawa 3	Oct. 16	128	42	10	22 20	118	27 15
Marquis, Ottawa 15	" 16	128	38	9	20 00	118	25 19
Ruby, Ottawa 135	" 8	120	36	9	18 40	108	19 21

The Huron variety, which is ahead this year and also in the five-year average, is a bearded wheat and is not considered equal to the Marquis in quality. The Ruby is an earlier variety than either of the other two, but is a lighter yielder. It might serve a useful purpose, however, in maturing farther north than the later and larger-yielding sorts.

OATS

Seven varieties of oats were under test in 1925. The seed was sown on May 15, in quadruplicate one-fortieth-acre plots, at two and one-half bushels per acre. The results obtained are as follows:—

VARIETY TEST OF 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 to mature four-year average, 1922-25	Yield of grain per acre four-year average, 1922-25
			inch		bush. lb.		bush. lb.
Banner O. 49	Sept. 26	134	52	9·2	65 20	125	64 09
O.A.C. No. 72	" 26	134	52	10·0	65 10	.....	.....
Gold Rain	" 24	132	47	10·0	62 02	121	64 21
Victory	" 26	134	49	9·0	61 26	122	66 01
Alaska	" 19	127	41	10·0	45 10	117	51 26
Liberty O. 480	" 21	128	43	10·0	34 04	117	40 05
Laurel, O. 477	" 22	130	43	10·0	34 04	.....	.....

The Victory variety is down to fourth place this year, but it is ahead in the four-year average. Banner and Gold Rain are about equal for the four-year average, while Banner is ahead of Gold Rain for this year. Alaska is considerably earlier than the other varieties listed, and is also somewhat thinner in the hull; but it is not quite so large a yielder.

Liberty and Laurel are hulless varieties.

BARLEY

Four varieties of six-rowed and one variety of two-rowed barley were under test in 1925. They were all sown on May 14, at the rate of two bushels per acre in quadruplicate one-fortieth-acre plots. However, owing to extremely wet weather it was found necessary to reseed all of the varieties except Himalayan. This was done on June 10. The results obtained are as follows:—

VARIETY TEST OF 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 to mature five-year average, 1921-25	Yield of grain per acre five-year average, 1921-25
			inch		bush. lb.		bush. lb.
Chinese, Ottawa 60	Sept. 26	108	40	10·0	50 00	.....	.....
Manchurian, Ottawa 50	Oct. 6	118	39	10·0	46 00	111	40 26
O.A.C. No. 21	Oct. 2	114	37	10·0	45 00	110	40 43
Duckbill, Ottawa 57	Oct. 16	128	39	10·0	35 13	118	38 24
Himalayan, Ottawa 59	Sept. 19	126	25	10·0	32 24	109	32 11

Chinese Ottawa 60 has given the largest yield in 1925, while in the four-year average there is not a great deal of difference between Manchurian, O.A.C. No. 21 and Duckbill.

Himalayan is a hulless variety and Duckbill is a two-rowed.

FIELD PEAS

Four varieties of peas were under test in 1925. The seed was sown on May 16, in quadruplicate one-fortieth-acre plots. The average rate of seeding was three bushels per acre. The results obtained are as follows:—

VARIETY TEST OF FIELD PEAS

Variety	Date of ripening	Number of days maturing	Average length of plant	Actual yield of grain per acre	Number of days to mature, five-year average, 1921-25	Yield of grain per acre, five-year average, 1921-25
			inch	bush. lb.		bush. lb.
MacKay	Oct. 2	139	68	37 50	.....	.....
Golden Vine	Sept. 26	133	60	32 30	125	33 06
Chancellor	Sept. 26	133	66	32 20	.....	.....
Arthur, Ottawa 18	Oct. 2	139	63	31 50	126	31 26

The MacKay variety gave the largest yield this year; but it did not mature as well as the other varieties. Golden Vine seemed to harden up better than any of the others.

SPRING RYE

One variety of common spring rye was under test in 1925. The seed was sown on May 16, in quadruplicate one-fortieth-acre plots at the rate of one and one-half bushels per acre. The results obtained are as follows: Matured in 126 days; straw, 41 inches long and strong; yield, 22.5 bushels. For the four years, 1922-25, this variety averaged 28 bushels per acre.

ROD-ROW PLOTS

In 1925 thirty-three varieties and strains of spring wheat, fifty-three of oats and thirty-five of barley were under test by this system. The wheat was seeded on May 20, the oats on May 21, and the barley on May 26.

The seed is sown in replicated rod-row plots, each plot being bordered on either side by one row of the same variety, seeded at a similar rate. At harvest time the centre row only is used for results, so that all competition and border effects are removed; though the border-rows are also harvested and threshed for comparison with the centre row. The rows are eighteen and one-half feet in length and seven inches apart. Before cutting, one foot is removed from each end leaving a plot sixteen and one-half feet in length.

This system of testing gives fairly accurate results and may be used to good advantage in testing large numbers of varieties and strains of cereal grains.

FORAGE CROPS

Forage crops as a class do well in northern Ontario. Clovers, alfalfa, sunflowers, annual hays, turnips, and grasses have always given very good results. Corn and mangels, however, have not as yet given very large yields.

The results from the forage crops as presented in this report are based on dry yields as obtained from shrinkage samples which were brought to absolute dry weight in a drying oven.

ENSILAGE CROPS

SUNFLOWERS

Nine varieties were under test. The seed was sown on June 24, in quadruplicate one-fortieth-acre plots, on fall-ploughed sod which was a mixture of clay and muck. It was given an application of manure at the rate of sixteen tons to the acre previous to ploughing in the autumn.

The rows were thirty inches apart, and the plants were thinned to six inches apart in the row. They were harvested on September 15. The results obtained are as follows:—

VARIETY TEST WITH SUNFLOWERS

Variety	Source of seed	Average height, 1925	Per cent in bloom when cut, 1925	Yield per acre			
				Green weight, 1925	Dry weight, 1925	Average green weight, 1924-25	Average dry weight, 1924-25
		ft. in.		tons lb.	tons lb.	tons lb.	tons lb.
Manchurian	A. E. McM	5 03	47	13 147	1 1,852	11 1,409	1 1,471
Mam. Russ	K. McD	5 10	.....	13 1,520	1 1,464	14 1,250	1 1,715
Russ. Giant	D.I. Seed Co	6 00	.....	13 560	1 1,310	16 340	2 183
Mam. Russ	C.P.R	5 02	8	10 1,573	1 1,125	12 152	1 1,234
Manchurian	C.P.R	5 04	33	10 1,320	1 1,050	11 1,600	1 1,416
Early Ottawa 76	C.E.F	5 03	12	10 133	1 932	11 802	1 1,207
Mixed	C.P.R	5 01	37	9 1,253	1 711	11 1,537	1 1,299
Black	C.P.R	5 04	35	10 853	1 704	13 222	1 1,656
Manteca	C.P.R	4 08	1	9 1,120	1 550	11 720	1 1,153

Manchurian is ahead this year in yield of dry matter, while Russian Giant, Mammoth Russian and Black are ahead of Manchurian in the two-year average.

VARIETY TEST WITH CORN

Twenty-five varieties were under test. The seed was sown on June 24, in quadruplicate one-eighth-acre plots, on fall-ploughed clay land which was manured at the rate of sixteen tons to the acre the previous year for O.P.V. The rows were thirty inches apart and the plants were thinned to about six inches apart in the row. The seed germinated well and an even stand was obtained, but owing to the weather being cool and wet the growth was small. There was no damage from frost until September 8, when some of the plants were touched, but as the plots were harvested on that date, this did not affect the weight. The average yield of green material for the twenty-five varieties is 4 tons 1,578 pounds and for dry material 1,184 pounds per acre. The ten highest-yielding varieties gave an average yield of 5 tons 1,431 pounds of green material and 1,409 pounds of dry material. Their names and source of seed in order of yield of dry material are as follows: Northwestern Dent, Brandon; Quebec 28, Dr. Todd; Northwestern Dent, Dakota Improved Seed Company; Twitchell's Pride, Frederickton; Twitchell's Price X Wisconsin No. 7, Ottawa; Longfellow, Duke; King Philip, Rennie; 90 Day White Dent, Dakota Improved Seed Company; Longfellow, Dakota Improved Seed Company; Leaming, Parks.

ANNUAL HAYS

OATS AS AN ANNUAL HAY

A variety test of oats for annual hay has been conducted for the last four years, using thirteen varieties, except in 1922 when twelve only were included.

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 time for harvesting.

In 1925 the seed was sown on May 15, in quadruplicate one-fortieth-acre plots, on fall-ploughed sod, at the rate of two and one-half bushels per acre. Some of the plots were slightly damaged by the heavy rains which came about the time the grain was coming up, but most of them grew well and gave fair yields.

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

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

Variety	Yield per acre			
	Green weight, 1925	Dry weight, 1925	Average green weight, 1924-25	Average dry weight, 1924-25
	tons lb.	tons lb.	tons lb.	tons lb.
Victory	6 760	2 623	6 595	2 525
Daubeney	5 1,200	2 433	5 745	1 1,822
Alaska	5 810	2 65	5 1,630	1 1,903
Banner	5 1,420	2 16	5 1,910	2 170
Abundance	5 770	1 1,893	5 1,855	2 126
O.A.C. No. 3	4 1,620	1 1,782	5 980	1 1,690
O.A.C. No. 72	5 170	1 1,654	5 975	1 1,852
Ligowa	5 1,160	1 1,612	5 840	1 1,716
Leader	4 1,990	1 1,520	5 795	1 1,675
Gold Rain	4 1,290	1 1,402	5 335	1 1,763
Liberty	4 1,450	1 1,306	5 1,040	1 1,301
Sensation	4 1,620	1 1,292	5 475	1 1,578
20th Century	4 720	1 1,091	4 1,610	1 1,342

It may be noted that fairly good yields, particularly of dry matter, have been obtained from all the varieties under test. For the two-year average, however, the coarser-growing sorts have given the best results.

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

AVERAGE YIELD OF ALL VARIETIES AT DIFFERENT STAGES OF MATURITY

Stage of Maturity	Yield per acre			
	Green weight, 1925	Dry weight, 1925	Average green weight, 1924-25	Average dry weight, 1924-25
	tons lb.	tons lb.	tons lb.	tons lb.
When in bloom	5 1,153	1 1,506	6 1,050	1 1,727
When turning	5 1,255	1 1,815	5 1,901	1 1,913
When nearly ripe	4 742	1 1,915	4 231	1 1,774

This table indicates that the greatest weight of dry matter is obtained when the oats are turning. It has also been observed that the hay cut at this stage is more palatable than that cut when nearly ripe and is about equal in palatability to the first stage.

It is worthy of note, however, how little change there is in the dry-matter content of oats after they are in bloom.

PEAS AS ANNUAL HAY

Five varieties were under test. The seed was sown on May 20, on quadruplicate one-fortieth-acre plots, on fall-ploughed sod. The rate of seeding

varied with the size of the peas; but averaged three bushels per acre. All varieties grew well and gave large yields. The results obtained are as follows:—

VARIETY TEST WITH PEAS AS ANNUAL HAY

Variety	Yield per acre							
	Green weight, 1925		Dry weight, 1925		Average green weight, 1924-25		Average dry weight, 1924-25	
	tons	lb.	tons	lb.	tons	lb.	tons	lb.
Canadian Beauty	16	1,890	3	1,402	12	1,110	2	1,258
Black Eyed Marrowfat	18	550	3	475	11	1,835	2	491
MacKay	18	.....	3	441	.....		.....	
Golden Vine	16	1,500	3	15	11	1,165	2	312
Arthur	16	820	2	1,706	12	345	2	179

This table shows that peas give larger yields of both green and dry material than oats as annual hay; but they lack palatability when grown and cured alone and for this reason should be used in a mixture with oats or oats and vetch.

VETCH AS ANNUAL HAY

Common vetch was under test as an annual hay crop. The seed was sown on May 28, in quadruplicate one-fortieth-acre plots, on fall-ploughed sod. The seed germinated well and a good yield was harvested. The results obtained are as follows:—

VETCH AS ANNUAL HAY

Variety	Yield per acre							
	Green weight, 1925		Dry weight, 1925		Average green weight, 1924-25		Average dry weight, 1924-25	
	tons	lb.	tons	lb.	tons	lb.	tons	lb.
Common	13	840	2	570	10	575	1	1,504

Vetch has given fair yields, but is better sown in a mixture with oats or oats and peas either for annual hay or silage.

SWEET CLOVER AS ANNUAL HAY

Three varieties have been under test as annual hay. In 1925 the seed was sown on May 26 in triplicate one-fortieth-acre plots at the rate of 20 pounds to the acre. The seed germinated well, and the crop was harvested on September 11. The results obtained are as follows:—

VARIETY TEST WITH SWEET CLOVER AS ANNUAL HAY

Variety	Average height, 1925	Yield per acre							
		Green weight, 1925		Dry weight, 1925		Average green weight, 1924-25		Average dry weight, 1924-25	
	inch	tons	lb.	tons	lb.	tons	lb.	tons	lb.
White Blossom	31	9	1,707	2	607	8	1,179	1	1,957
Yellow Blossom	22	7	1,507	1	1,634	5	1,244	1	726
Hubam	42	11	987	2	1,285	8	1,404	2	70

The figures in this stable indicate that White Blossom sweet clover is almost equal to Hubam as an annual hay; while the Yellow Blossom is finer in nature and a lighter yielder than either of the other two.

BIENNIAL VERSUS ANNUAL SWEET CLOVER

The object of this experiment is to compare the results obtained from biennial sweet clover during the second year with annual sweet clover. The two biennial varieties were sown on June 5, 1924, in quadruplicate one-fortieth-acre plots on fall-ploughed sod at the rate of 20 pounds per acre, and the annual variety was sown on May 26, 1925, in a similar manner. No winter injury was suffered by the biennial sorts and the annual seed gave good germination. The biennial plots were harvested on August 6 and the annual plots on September 11. The results obtained are as follows:—

BIENNIAL VERSUS ANNUAL SWEET CLOVER

Variety	Average height, 1925	Yield per acre							
		Green weight, 1925		Dry weight, 1925		Average green weight, 1924-25		Average dry weight, 1924-25	
	inch	tons	lb.	tons	lb.	tons	lb.	tons	lb.
Biennial—									
White Blossom	70	11	160	2	1,324	9	840	2	355
Yellow Blossom	48	8	150	2	337	8	289	2	12
Annual—									
Hubam	39	8	413	1	1,853	7	1,687	1	1,528

The figures in this table would seem to indicate that White Blossom or Yellow Blossom sweet clover will give as large or larger yields during the second year of their growth than Hubam during the first year.

FIELD ROOTS

In 1925 the field roots were all seeded in quadruplicate one-eightieth-acre plots, with the rows thirty inches apart. Owing to excessive rainfall, however, which drowned out a number of the plots, and also to some damage suffered from cutworms it was found that only single plots were suitable for experimental purposes, with the exception of the variety test of fall turnips where all four plots were used.

MANGELS

Thirty varieties were under test. The seed was sown on June 23, on fall-ploughed stubble, which was manured at the rate of sixteen tons to the acre previous to ploughing. The plants were thinned to eight inches apart in the row.

The plots were harvested on October 12, and the results from the ten, highest-yielding varieties are as follows:—

VARIETY TEST WITH MANGELS. RESULTS FROM 10 HIGHEST-YIELDING VARIETIES 1925

Variety	Source of seed	Yield per acre		Per cent true to type.	Type
		Green weight, 1925	Dry weight, 1925		
		tons lb.	tons lb.		
Rosted Barres	Hartman	19 1,680	2 1,718	90	Intermediate
Fjerritslev Barres	Hartman	8 1,280	1 1,038	70	Intermediate
Elvethan Mammoth	Hartman	8 720	1 913	60	Intermediate
Yellow Leviathan	Steele Briggs	8 1,520	1 826	80	Intermediate
Giant White Sugar	Steele Briggs	9 720	1 793	95	Half long
Svalof Orig. Rubra	Gen. Swedish	8 1,120	1 755	90	Half long
Giant Red Sugar	Bruce	9 720	1 750	80	Intermediate
Gatepost	Bruce	8 1,200	1 681	75	Half long
Barres Oval	Gen. Swedish	8 1,120	1 674	80	Tankard
Eckendorfer Red	Hartman	9 800	1 673	90	Tankard

Mangels have never given very large yields at this Station, and have always been more or less uncertain in germination and development.

The Rosted Barres variety seems to be standing out as a very superior sort, in yield of both green and dry matter.

SUGAR BEETS

Eight varieties were under test. The seed was sown on June 23, on fall-ploughed sod, which was manured at the rate of sixteen tons to the acre previous to ploughing. The seed germinated well. The roots were harvested on October 17. The results obtained are as follows:—

VARIETY TEST WITH SUGAR BEETS

Variety	Source of Seed	Yield per acre	
		Green weight 1925	Dry weight 1925
		tons lb.	tons lb.
Henning	D.S. Co.	9 1,840	2 1,704
Vilmorin	Andrieux	10 1,280	2 988
Horning	D.S. Co.	9 1,280	2 714
Shreiber	D.S. Co.	9 1,200	2 516
Dieppe	D.S. Co.	9 640	2 515
Dr. Bergman	D.S. Co.	9 1,360	2 356
Rabbethege	D.S. Co.	8 880	1 1,930
Home Grown	D.S. Co.	7 1,760	1 1,707

The sugar beets like mangels have not given very large yields. There seems to be considerable variation in the percentage of dry matter which the various sorts contain.

SWEDE TURNIPS

Twenty-four varieties were under test. The seed was sown on June 24, on fall-ploughed stubble which was manured at the rate of sixteen tons to the acre previous to ploughing. The plants were thinned to twelve inches apart in the row.

The roots were harvested on October 9, and the results from the ten highest-yielding varieties are as follows:—

VARIETY TEST WITH SWEDE TURNIPS. RESULTS FROM 10 HIGHEST-YIELDING VARIETIES, 1925

Variety	Source of seed	Yield per acre			
		Green weight 1925	Dry weight 1925	Average green weight 1924-25	Average dry weight 1924-25
		tons lb.	lb.	tons lb.	tons lb.
Bangholm	Charlottetown	6 1,440	1,989	9 1,720	1 468
White Swedish	Bruce	6 400	1,831	8 360	.. 1,963
Good Luck	Steele Briggs	6 1,120	1,778	8 240	.. 1,759
Selected Purple Top	Steele Briggs	6 1,360	1,764	10 670	1 221
Olsgaard Bangholm	Hartman	6 800	1,760	10 1,140	1 34
Magnum Bonum	Bruce	6 560	1,756	9 480	1 98
Bangholm	Ewing	5 1,840	1,652	7 1,720	.. 1,747
Hartley's Bronze Top	Graham Bros.	6 960	1,625	8 930	.. 1,913
Jumbo	Steele Briggs	5 1,040	1,617	6 1,970	.. 1,629
Ditmars	McNutt	6 1,600	1,610	9 1,520	.. 1,992

Swede turnips generally do very well in this district, and make an excellent feed for live stock.

FALL TURNIPS

Twelve varieties were under test. The seed was sown on June 23, in a similar manner to the swedes, on fall-ploughed sod. All varieties germinated and grew fairly well. They were harvested on October 3. The results obtained are as follows:—

VARIETY TEST WITH FALL TURNIPS

Variety	Source of seed	Yield per acre					
		Green weight 1925		Dry weight 1925		Average green weight 1924-25	Average dry weight 1924-25
		tons	lb.	tons	lb.	tons lb.	tons lb.
Red Paragon	Suttons & Sons	12	460	1	3	14 360	1 211
White Globe	Ewing	10	1,260	..	1,895	10 1,970	.. 1,876
Purple Top Aberdeen	Suttons & Sons	10	240	..	1,886	10 1,780	.. 1,876
Improved Greystone	Steele Briggs	11	800	..	1,768	12 990	.. 1,969
Fynsk Bortfelder	Hartman	10	1,520	..	1,765	12 1,080	1 87
Green Top Yellow Aberdeen	Ewing	9	700	..	1,722	8 1,970	.. 1,772
Early Six Weeks	Suttons & Sons	12	1,573	..	1,709	11 737	.. 1,567
Devonshire Greystone	Steele Briggs	10	1,180	..	1,694	12 680	.. 1,982
Aberdeen Yellow Purple Top	Steele Briggs	8	1,380	..	1,644	12 750	1 229
Purple Top Mammoth	Suttons & Sons	11	380	..	1,608	11 990	.. 1,820
Hardy Green Round	Suttons & Sons	10	1,733	..	1,556	11 1,607	.. 1,779
Pomeranian White Globe	Steele Briggs	9	1,600	..	1,513	12 1,774	1 170

Fall turnips give a larger yield of green matter than swedes but owing to their high water-content there is not much difference in yield of dry matter. They are rapid growers, but are rarely good keepers, consequently they should be fed in late autumn or early winter.

DATE OF SEEDING FALL TURNIPS

The object of this experiment is to compare the yields obtained and the keeping-quality of fall turnips when seeded at different dates. Hardy Green Round was the variety used. The seed was sown at intervals of seven days, commencing on June 24. This was much later than usual and on this account no yields were obtained from the last two dates of seeding.

The roots were harvested on October 3. The results obtained are as follows:—

DATE OF SEEDING FALL TURNIPS

Date of seeding	Yield per acre	
	Green weight 1925	Dry weight 1925
	tons lb.	tons lb.
June 14	10 480	1 40
July 2	8 480	0 1,610
July 8	7 320	0 1,544
July 15	4 1,920	0 1,054

The early seeding has given the largest yield, consequently it would appear that even fall turnips should be seeded reasonably early in order to obtain the best results.

In keeping quality there appeared to be a greater variation between the individual roots than there was between those produced from different dates of seeding.

FIELD CARROTS

Thirteen varieties were under test. The seed was sown on June 24, in a similar manner to the other root crops. The plants were thinned to about four inches apart in the row. They were harvested on October 5, and the results from the seven leading varieties are as follows:—

VARIETY TEST WITH FIELD CARROTS

Variety	Source of seed	Yield per acre			
		Green weight 1925	Dry weight 1925	Average green weight 1924-25	Average dry weight 1924-25
		tons lb.	lb.	tons lb.	lb.
White Belgian	Hartman	3 1,120	859	4 1,540	1,040
Improved Short White	Steele Briggs	3 1,520	781	5 1,400	1,121
Mammoth Intermediate	Bruce	3 1,040	759	5 20	1,035
Long White Belgian	Steele Briggs	3 880	750	4 550	897
Danish Champion	Hartman	3 240	743	3 1,670	874
White Belgian 9008	Trifolium	3 400	707	5 40	1,077
White Belgian	D. & F.	3 240	697	4 1,020	998

Field carrots have always grown very well in this district. They may be used to good advantage as a conditioner for horses.

LEGUMES AND GRASSES

HAY PRODUCTION FROM GRASSES ALONE AND IN COMBINATION WITH CLOVERS

The objects of this experiment are to compare the results obtained in yield and quality of hay produced from timothy, orchard grass, and meadow fescue, when 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 1923 this experiment was seeded in triplicate one-fortieth-acre plots using barley as a nurse-crop. In 1924 it was seeded in quadruplicate plots of the same size, with barley again as the nurse-crop. The following table shows the results obtained from these two seedings to date.

HAY PRODUCTION EXPERIMENT FROM GRASSES ALONE AND IN COMBINATION WITH CLOVERS

Seed sown per acre					Yield per acre							
					Seeded 1923				Seeded 1924		Seeded 1923-24	
Red Clover	Alsike Clover	Timothy	Meadow Fescue	Orchard Grass	Green weight, 1925	Dry weight, 1925	Green weight, 1925	Dry weight, 1925	Average green weight, 1924-25	Average dry weight, 1924-25
lb.	lb.	lb.	lb.	lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.
10	....	8	....	....	5 1,800	2 10	5 1,770	1 1,390	7 879	2 64
10	....	....	15	....	4 1,813	1 1,192	6 290	1 1,725	7 33	1 1,851
10	....	....	....	15	4 1,840	1 700	6 30	1 1,280	6 1,761	1 1,382
10	....	6	10	....	4 1,813	1 1,361	5 1,560	1 1,439	6 1,777	1 1,669
10	....	6	....	10	5 613	1 1,503	5 1,130	1 1,235	6 1,043	1 1,586
10	....	....	10	10	4 1,600	1 812	4 1,170	1 820	6 666	1 1,227
....	6	8	....	....	5 1,787	2 38	4 470	1 938	6 91	1 1,540
....	6	....	15	....	4 1,587	1 1,003	4 560	1 818	5 1,964	1 1,270
....	6	....	....	15	4 1,293	1 717	4 800	1 714	6 284	1 908
....	6	6	10	....	5 1,773	1 1,875	4 570	1 708	5 1,673	1 1,306
....	6	6	....	10	6 747	1 1,928	3 390	1 315	5 1,538	1 1,134
....	6	....	10	10	5 733	1 1,431	3 1,090	1 483	5 710	1 1,329
8	2	8	....	....	6 67	2 171	5 530	1 945	5 1,450	1 1,355
8	2	....	15	....	5 853	1 1,635	5 1,230	1 1,525	5 1,175	1 1,319
8	2	....	....	15	4 480	1 774	6 1,620	1 1,418	5 525	1 888
8	2	6	10	....	4 1,493	1 1,430	6 110	2 107	5 395	1 1,192
8	2	6	....	10	5 1,253	1 1,903	6 420	1 1,702	6 1,352	1 1,526
8	2	....	10	10	5 1,627	1 1,727	6 1,150	1 1,657	6 1,635	1 1,598
....	....	12	....	....	5 1,973	2 665	3 730	1 710	4 1,996	1 1,481
....	....	....	30	....	4 1,560	1 963	3 180	1 635	4 842	1 632
....	....	....	....	30	4 1,173	1 697	2 410	0 1,838	3 1,463	1 93
....	....	8	15	....	5 1,027	1 1,780	2 920	1 378	4 1,154	1 736
....	....	8	....	15	5 933	1 1,519	2 610	0 1,995	4 886	1 777
....	....	....	15	15	5 1,493	1 1,146	2 320	1 78	4 1,587	1 772

It may be noted from the figures in this table that good yields of hay may be obtained from all of the various mixtures tried.

Timothy seems to be slightly better adapted to this district than either meadow fescue or orchard grass, both when grown alone and in the various mixtures.

On the average the mixture containing red clover alone has given larger yields than those containing alsike alone or a mixture of red and alsike.

TIMOTHY AND CLOVERS FOR HAY PRODUCTION

The objects of this experiment are to compare the results obtained 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 1923 this experiment was seeded in triplicate one-fortieth-acre plots. In 1924 it was repeated in a similar manner in quadruplicate plots. The following table gives the results obtained from these two seedings to date:—

TIMOTHY AND CLOVERS FOR HAY PRODUCTION

Seed sown per acre			Yield per acre					
			Seeded 1923		Seeded 1924		Seeded 1923-24	
Timothy	Red Clover	Alsike Clover	Green weight, 1925	Dry weight, 1925	Green weight, 1925	Dry weight, 1925	Average green weight, 1924-25	Average dry weight, 1924-25
lb.	lb.	lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.
8	10	.....	4 947	1 795	9 720	2 777	6 1,931	1 1,486
8	8	2	4 1,253	1 773	9 240	2 1,005	7 374	1 1,572
8	6	3	5 320	1 1,370	8 1,627	2 775	6 1,927	1 1,757
8	4	4	5 373	1 1,143	8 587	2 199	6 1,587	1 1,391
8	2	5	4 40	1 531	7 653	2 93	5 1,574	1 1,093
6	10	.....	3 1,800	1 457	8 1,200	2 904	6 197	1 1,242
6	8	2	4 1,080	1 946	8 947	2 750	6 847	1 1,577
6	6	3	4 360	1 662	8 780	2 826	5 1,779	1 1,157
6	4	4	3 1,507	1 419	7 1,140	2 640	5 1,202	1 1,073
6	2	5	4 1,853	1 1,006	6 1,380	2 76	6 929	1 1,286

It may be noted that there does not appear to be any significant differences in the results obtained from these various mixtures. In fact the figures indicate that, timothy red clover and alsike clover may be each or all varied considerably in a mixture without materially affecting the resultant crop. The kind of soil, the purpose of the crop and the quality of hay desired must be considered in formulating a suitable seed mixture to sow for hay production.

LATE AND EARLY CLOVER WITH LATE AND EARLY GRASS

The object of this experiment is to compare the results obtained 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 1923 in triplicate one-fortieth-acre plots using barley as a nurse crop. It was repeated in 1924 in quadruplicate plots of the same size. The results obtained are as follows:—

LATE AND EARLY CLOVER WITH LATE AND EARLY GRASS

Seed sown per acre				Yield per acre					
				Seeded 1923		Seeded 1924		Seeded 1923-24	
Timothy	Meadow Fescue	Early Red Clover	Late Red Clover	Green weight, 1925	Dry weight, 1925	Green weight, 1925	Dry weight, 1925	Average green weight, 1924-25	Average dry weight, 1924-25
lb.	lb.	lb.	lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.
8	.....	10	.....	5 867	1 1,116	8 613	2 132	7 217	1 1,322
.....	15	10	.....	5 493	1 873	7 867	2 46	7 694	1 1,564
8	.....	.....	10	6 40	1 1,574	7 973	2 185	7	1 1,379
.....	15	.....	10	5 907	1 956	6 1,880	2 46	6 557	1 1,280

Early red clover has given a larger yield than late red clover when mixed with meadow fescue which is an early grass; while there is practically no difference when it was mixed with timothy.

LATE VERSUS EARLY CLOVER IN STANDARD HAY MIXTURE

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

This experiment was seeded in 1923 in triplicate one-fortieth acre plots using barley as a nurse-crop. In 1924 it was repeated in quadruplicate plots of the same size. The results obtained are as follows:—

LATE VERSUS EARLY CLOVER IN STANDARD HAY MIXTURE

Seed sown per acre				Yield per acre					
				Seeded 1923		Seeded 1924		Seeded 1923-24	
Timothy	Alsike Clover	Common Red Clover	Late Red Clover	Green weight, 1965	Dry weight, 1925	Green weight, 1925	Dry weight, 1925	Average green weight, 1924-25	Average dry weight, 1924-25
lb.	lb.	lb.	lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.
8	2	8	.....	6 1,173	1 1,868	3 500	1 770	5 705	1 1,194
8	2	.....	8	6 1,440	1 1,914	2 1,570	1 478	5 713	1 1,083

The figures in this table would seem to indicate that there is practically no difference betwen 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 obtained in hardiness, yield and quality of hay produced from different varieties, or strains of red clover procured in different sections of Canada and Europe.

In 1923 twelve varieties were sown in triplicate one-fortieth-acre plots using barley as a nurse-crop. In 1924 the test was repeated using quadruplicate plots of the same size. The results obtained are as follows:—

VARIETY TEST WITH RED CLOVER

Variety	Yield per acre							
	Seeded 1923		Seeded 1924		Seeded 1923-24			
	Green weight, 1925	Dry weight, 1925	Green weight, 1925	Dry weight, 1925	Average green weight, 1924-25	Average dry weight, 1924-25		
	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.		
Oxdrift	5 1,413	1 962	.....	.....	.....	.....		
Early Swedish	5 1,053	1 824	5	1 695	6 1,230	1 708		
St. Clet	3 1,853	1 494	4 1,840	1 787	6 1,064	1 822		
Alta Swede	4 653	1 320	8 1,640	2 787	6 1,887	1 1,070		
Swedish Late	4 173	1 316	6 920	1 1,368	6 1,114	1 831		
Kapuskasing	3 1,267	1 274	7 880	1 1,559	6 884	1 865		
Swedish Med. Late	3 893	1 187	.....	.....	.....	.....		
St. Casimir	3 40	1 117	5 1,160	1 637	5 1,987	1 609		
Ottawa	2 1,733	0 1,868	8 280	1 1,687	6 770	1 715		
Alfred Station	.....	.....	6 1,920	1 1,072	.....	.....		

It may be noted that while twelve varieties were under test only nine have given any results this year as the Italian varieties all killed out. This is a very important point for the farmers of this district to know, as it is quite evident that the southern grown sorts are entirely unsuited to the climate found in this part of the province.

METHODS OF SEEDING ALFALFA FOR HAY PRODUCTION

The objects of this experiment are to compare the results obtained in yield and quality of hay produced from alfalfa, when seeded broadcast at the rate of

twenty pounds per acre, versus when seeded in rows twelve inches apart; and also to compare the results obtained from plots seeded with and without a nurse-crop.

In 1923 this experiment was seeded in triplicate one-fortieth-acre plots using barley as a nurse-crop and in 1924 it was repeated on similar sized plots in quadruplicate. Unfortunately, however, two series of the 1924 seeding were drowned out so that duplicate plots were used for the test. The results obtained are as follows:—

METHODS OF SEEDING ALFALFA FOR HAY PRODUCTION

Method	Yield per acre					
	Seeded 1923		Seeded 1924		Seeded 1923-24	
	Green weight, 1925	Dry weight, 1925	Green weight, 1925	Dry weight, 1925	Average green weight, 1924-25	Average dry weight, 1924-25
	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.
With a nurse-crop—						
In drills 12 inches apart...	6 1,853	1 1,752	4 1,260	1 905	9 259	2 782
Broadcast 20 lb. per acre.	6 453	1 1,547	5 1,840	1 1,630	8 1,680	2 513
Without a nurse-crop—						
In drills 12 inches apart...	7 147	2 342	6 1,200	2 60	9 391	2 981
Broadcast 20 lb. per acre.	6 827	1 1,846	7 280	2 461	9 1,690	2 1,203

The figures in this table would seem to indicate that alfalfa will give about equal results whether it is sown in rows twelve inches apart or broadcast at the rate of twenty pounds per acre. From observation, it would appear that seeding broadcast is the better practice, because there is a greater tendency for weeds to become established when the seeding is done in rows.

There is hardly sufficient difference between the plots seeded with a nurse-crop and those seeded without to justify recommending the latter practice; because it means the loss of one season's crop and there is also a much greater tendency for weeds to become established. In fact it is quite possible that the seeding of alfalfa at the rate of five or six pounds to the acre in the regular hay mixture may become a very profitable and largely adopted practice in this part of Ontario.

The results from alfalfa growing at this Station so far have been very encouraging and farmers would be well advised in trying this plant out in a small way at least.

NITRO-CULTURE ON ALFALFA

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

In 1923 this experiment was seeded in triplicate one-fortieth-acre plots at the rate of twenty pounds per acre, without a nurse-crop. In 1924 it was repeated in a similar manner in quadruplicate plots. The results obtained are as follows:—

NITRO-CULTURE ON ALFALFA

Treatment	Yield per acre					
	Seeded 1923		Seeded 1924		Seeded 1923-24	
	Green weight, 1925	Dry weight, 1925	Green weight, 1925	Dry weight, 1925	Average green weight, 1924-25	Average dry weight, 1924-25
	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.
Treated.....	6 920	1 1,355	5 1,800	1 1,720	8 880	2 419
Untreated.....	6 733	1 1,473	5 1,960	1 1,668	7 1,580	2 160

The first few years that this experiment was carried on, a marked advantage was obtained from treating the seed with nitro-culture. However, the harrows and other farm machinery working in the experimental grounds have distributed the bacteria over the field to such an extent that it is doubtful if any material difference will be noted in future tests. Farmers, however, should not neglect this feature, particularly where no alfalfa has been previously grown.

NITRO-CULTURE ON RED CLOVER

The object of this experiment is to compare the results obtained from red clover seeded with and without nitro-culture treatment. In 1923 this experiment was seeded in triplicate one-fortieth-acre plots, using barley as a nurse-crop. In 1924 it was seeded in quadruplicate plots in a similar manner. The results obtained are as follows:—

NITRO-CULTURE ON RED CLOVER

Treatment	Yield per acre					
	Seeded 1923		Seeded 1924		Seeded 1923-24	
	Green weight, 1925	Dry weight, 1925	Green weight, 1925	Dry weight, 1925	Average green weight, 1924-25	Average dry weight, 1924-25
	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.
Treated	6 1,173	1 1,270	9 1,280	2 863	5 1,947	1 969
Untreated	6 1,120	1 1,341	8 1,040	2 506	5 1,834	1 1,043

No significant difference in yields has ever been obtained between treated and untreated red clover. As red clover grows so readily in this district it would seem reasonable to expect that the soil is already well inoculated with the proper bacteria for this plant.

THE 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, seeding in rows twelve inches apart, and in rows twenty-four inches apart, and also to compare the monetary returns from red clover used as a hay crop with red clover used as a seed crop.

The series which was harvested in 1925 was seeded on June 4, 1924 in quadruplicate one-fortieth-acre plots, using barley as a nurse-crop. The following table gives the results obtained:—

RED CLOVER SEED PRODUCTION

Method of seeding and purpose of crop	Yield per acre		
	Of seed 1925	Of hay and clover straw, 1925	Value of crop, 1925
	bush. lb.	tons lb.	$ cts.
Broadcast, two cuttings for hay	.....	2 1,566	50 09
Broadcast, first cutting for hay second for seed	.....	2 1,283	47 55
Broadcast, first cutting for seed	3 40	3 84	81 21
Rows 12 inches apart, first cutting for seed	3 40	2 1,679	80 20
Rows 24 inches apart, first cutting for seed	4 ..	2 1,886	86 72

The strain of red clover used in this experiment, which is of a perennial nature, developed a very short second growth, with practically no heads and on this account no seed was obtained from the second crop. In fact, it is very seldom that red clover gives a satisfactory yield of seed from the second cutting in this district, and therefore the first crop is to be recommended for seed production.

Comparing the yields of seed obtained from broadcast sowing and in rows it is found that broadcast and rows twelve inches apart have given the same results, while rows twenty-four inches apart gave a slightly greater yield. The difference is not sufficient to justify recommending seeding in rows, as this system gives weeds a much better chance to become established unless cultivation is followed which would add to the cost of production.

From the standpoint of monetary returns, with the hay valued at $18 per ton, clover straw at $5 per ton and clover seed at 30 cents per pound, the seed crop has given the best returns. This depends largely on the comparative yields of hay and seed, but in most years, the farmer would be well advised to save at least sufficient seed for his own requirements. In fact there is greater danger of the hay market becoming over supplied than there is of the seed market.

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 broadcast, in rows twelve inches apart and in rows twenty-four inches apart.

The results in 1925, are from a series which was seeded on June 5, 1924 in quadruplicate one-fortieth-acre plots, using barley as a nurse-crop. The results obtained to date are as follows:—

ALSIKE SEED PRODUCTION

Method of Seeding	Yield of seed per acre			
	1925		Average, 1922-25	
	bush.	lb.	bush.	lb.
Broadcast	3	40	3	41
Rows twelve inches apart	3	33	3	42
Rows twenty-four inches apart	3	47	3	17

The figures in this table indicate that there is practically no difference in the yields of seed obtained from seed sown broadcast and in rows twelve or twenty-four inches apart. However, in the four-year average, the plots seeded in rows twenty-four inches apart have given a slightly lower yield than the other two. This together with the fact that broadcast seeding has a tendency to give a more even stand with fewer weeds, would seem to recommend this system.

TIMOTHY SEED PRODUCTION

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

In establishing this experiment it was intended that the mixed plot would be cut for hay the first year and saved for seed the second, on the assumption that by the second year most of the red clover would have died out and consequently the stand would be largely timothy.

In 1923 this experiment was seeded on May 21, in triplicate one-fortieth-acre plots, using barley as a nurse-crop. In 1924 it was seeded in a similar manner in quadruplicate plots. The results obtained to date are as follows:—

TIMOTHY SEED PRODUCTION

Method of seeding	Amount sown per acre	Yield per acre					
		Seeded 1923 yields 1925		Seeded 1924 yields 1925		Average 1922-25	
	lb.	bush.	lb.	bush.	lb.	bush.	lb.
Broadcast timothy	10	.....		.....		.....	
Broadcast Red clover	8	5	00	.....		2	31
Broadcast timothy	10	7	14	5	20	4	00
Rows 12 inches apart	.....	7	04	5	10	3	41
Rows 24 inches apart	.....	7	04	5	10	3	42

The results from this experiment would seem to indicate that there is very little difference between the various methods of seeding. From observation, the broadcast method, is simpler to sow, gives an evener stand and fewer weeds and for these reasons might be recommended in preference to the row system.

Owing to the fact that the plot seeded with a mixture of timothy and red clover still contains a considerable quantity of red clover the second year, it is only suitable for the production of mixed seed, and therefore cannot be recommended if pure timothy seed is desired.

POULTRY

No changes or additions have been made to the poultry buildings during the past year. The four main houses, two of which are log and two are frame, will each accommodate 100 birds. In addition to these there are six colony houses and the incubator and brooder house.

Three hundred laying pullets are kept on experiment each winter while about 100 hens, most of which are pedigreed, are carried over for breeding purposes.

The Barred Plymouth Rock is the only breed which has been kept. This is a good general purpose breed, as the birds are a fair size and reasonably good layers.

The prices charged for the various feeds used in the different experiments are based on the average market prices for the year and are as follows:—

Wheat, $3; oats, $2.50; barley, $2.50; corn, $2.90; bran, $1.60; middlings, $2; shorts, $1.70; low-grade flour, $2.50; meat meal, $3.85; tankage, $2.55; beef scrap, $4.35; milk, $0.50; oyster-shell, $1.25; charcoal, $3; grit, $2; chick mash, $4.90; clover leaves, $1; and mangels, $0.25.

Eggs are valued at sixty cents per dozen for the six months which the experiments cover.

SKIM-MILK VERSUS BEEF SCRAP

The object of this experiment is to compare the result obtained from the use of skim-milk and beef scrap as a source of animal protein for winter egg production. This test has been conducted for four years and in 1924-25 was commenced on November 1, and continued until April 30, covering a period of six months. One hundred pullets were used. They were divided into two pens of 50 birds each, of equal size and general development. The ration given to each pen was the same with the exception of the skim-milk and beef scrap. The

scratch ration consisted of two parts each of whole wheat and cracked corn and one part each of whole oats and barley. Ful-O-Pep laying mash was the dry mash used. The beef scrap was fed from a hopper and the skim-milk from a drinking vessel. A supply of each was available to the respective pens at all times. Mineral matter and green feed were also supplied to each lot.

The results obtained in 1924-25 together with the four-year average are as follows:—

SKIM-MILK VERSUS BEEF SCRAP

Items	Skim-milk 1924-25	Beef scrap 1924-25	Skim-milk four-year average per bird per month	Beef scrap four-year average per bird per month
Number of birds.....No.	50·0	50·0	.....	.....
Pounds of animal feed.....lb.	1,474·0	104·0	5·66	0·806
Cost of animal feed..... $	7·37	4·52	0·028	0·04
Pounds of scratch feed.....lb.	1,629·0	1,648·0	4·97	5·06
Pounds of mash.....lb.	458·0	434·0	2·31	1·84
Total cost of feed..... $	81·96	78·24	0·22	0·23
Number of eggs laid.....No.	2,902·0	2,709·0	6·84	6·35
Value of eggs laid..... $	145·1	135·45	0·33	0·31
Cost per doz..... $	0·33	0·34	0·38	0·43
Profit over cost..... $	63·14	57·21	0·11	0·08

The figures in the table would seem to indicate that:

1. Birds getting beef-scrap eat slightly more scratch-grain and a little less mash than those getting skim-milk.

2. Higher production at a lower cost per dozen may be obtained by the use of skim-milk than of beef scrap.

3. Skim-milk at fifty cents per one hundred pounds is a cheaper and better source of animal protein for laying hens and pullets than beef scrap at market prices.

4. Farmers and other poultry keepers who have a supply of skim-milk need not purchase any other animal feed for their poultry.

5. For certain farmers who may not have a supply of skim-milk available or for poultry keepers in towns or villages beef scrap may be used to good advantage as a source of animal protein, particularly for year-old hens.

SPROUTED OATS VERSUS CLOVER

The object of this experiment is to compare the relative value of sprouted oats versus clover leaves when used as a green feed. This test has been conducted for three years, using 100 pullets in each case. In 1924-25 it was commenced on November 1, and continued until April 30, covering a period of six months. The ration fed to each lot was the same with the exception of the green feed. The one lot got all the sprouted oats they could handle from a trough while the other lot was fed the clover in the litter.

Each lot received a scratch ration of two parts each of whole wheat and cracked corn and one part each of whole oats and barley. The dry mash consisted of equal parts of bran, middlings, corn meal, ground oats and barley plus ten per cent meat meal. In addition, mineral matter and beef scrap were kept before the birds in hoppers continuously. The results obtained in 1924-25 together with the three-year average are as follows:—

SPROUTED OATS VERSUS CLOVER.

Items	Sprouted oats 1924-25	Clover leaves 1924-25	Sprouted oats three-year average per month	Clover leaves three-year average per month
Number of birds.....No.	50·0	50·0	50·0	50·0
Pounds of green feed.....lb.	301·0	325·0	42·63	36·74
Cost of green feed.....$	7·52	3·25	0·86	0·36
Pounds of scratch.....lb.	1,680·0	1,660·0	266·0	264·33
Pounds of mash.....lb.	553·0	680·0	90·90	97·82
Total cost of feed.....$	78·80	78·54	11·50	11·06
Number of eggs laid.....No.	4,150·0	4,370·0	427·0	424·0
Value of eggs laid.....$	207·50	218·50	21·35	21·20
Cost per doz.....$	0·22	0·21	0·32	0·31
Profit over cost.....$	128·70	139·96	9·85	10·14

The figures in this table would indicate that:

1. There is little or no difference in the cost of feed required between birds getting sprouted oats and those getting clover leaves as a green feed.

2. There is also very little difference in the production, as this year is higher for clover leaves while the three-year average is higher for sprouted oats.

3. Either may be used to good advantage as a green feed for laying pullets.

LIGHTS VERSUS NO LIGHTS

The object of this experiment is to compare the results obtained in egg production and general development of the birds 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 two years, using one hundred pullets in each case, and covering a period of six months, from November 1, to April 30. The birds are equally divided as to weight, general development and breeding into two pens of fifty each. All conditions were similar except that the one pen had these extra hours of light to work while the others had not. The results obtained in 1924-25 together with the two-year average are as follows:—

Item	Lights, 1924-25	No lights, 1924-25	Lights, two-year average	No lights, two-year average
Number of birds.....No.	50·0	50·0	50·0	50·0
Weight at beginning.....lb.	238·0	235·0	227·5	231·0
Weight at finish.....lb.	260·0	261·0	254·5	250·5
Pounds of scratch.....lb.	1,595·0	1,575·0	1,557·5	1,560·0
Pounds of mash.....lb.	395·0	360·0	472·5	435·0
Total cost of feed.....$	70·99	69·81	65·37	65·08
Number of eggs laid.....No.	3,545·0	2,854·0	2,806·0	2,196·0
Value of eggs laid.....$	177·25	142·70	140·30	109·80
Cost per doz.....$	0·24	0·29	0·27	0·35
Profit over cost.....$	106·26	72·89	74·93	44·72

The figures in the table would indicate that:

1. Lights have very little effect on the body-weight of laying pullets during the winter months.

2. Lights also have little effect on the amount of feed eaten and therefore on cost of feed.

3. Lights have a marked effect on the number of eggs produced and therefore on the cost of production. The birds receiving the lights produced eggs at 8 cents per dozen less cost than those not on lights over a period of two years.

CRATE-FATTENING

The objects of this experiment are to determine (1) if crate fattening cockerels is profitable; (2) if home grown feeds are suitable for crate fattening; (3) if it pays to purchase a commercial feed like corn and add it to the home-grown feeds; (4) if it would pay to use all commercial feeds rather than all or part home-grown; and (5) if tankage and water could take the place of skim-milk in a fattening ration.

This experiment has been conducted for four years and two of those years with duplicate lots, making in all 432 birds, which have been used in the test. In 1925 the experiment was repeated in a similar manner to the other years. Seventy-two well-developed cockerels were selected and divided equally as to weight and general development, and placed in six crates, each of which had three compartments holding four birds. The pens were all housed in the same quarters and fed the following rations: Pen 1, equal parts of wheat, oats and barley, plus skim-milk; pen 2, equal parts of wheat, oats and barley, tankage 15 per cent and water; pen 3, equal parts of wheat, oats, barley and corn plus skim-milk; pen 4, equal parts of wheat, oats, barley and corn, tankage 15 per cent and water; pen 5, equal parts of corn, low-grade flour and middlings, plus skim-milk; pen 6, equal parts of corn, low-grade flour and middlings, tankage 15 per cent and water. The oats, barley, wheat and corn, were all finely ground and the coarser hulls were removed from the oats and barley, but these were charged against the respective pens.

The experiment was commenced on October 15, and continued until November 7, covering a period of twenty-one days or forty-two feedings. Generally speaking, the birds have stayed in good health and maintained their appetite to the end of the test, as only one bird has died during the four years which the test has been conducted. The results obtained in 1925, together with the four-year average are as follows:—

CRATE-FATTENING EXPERIMENT

Pen	Weight at beginning	Weight at end	Value at beginning	Value at end	Increase in value	Value of total feed	Net profit per pen
	lb. oz.	lb. oz.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
1.—1925	56 4	72 4	19 68	25 28	5 60	2 73	2 87
Four-year average	52 09	72 0	17 19	23 46	6 27	2 74	3 53
2.—1925	56 4	68 8	19 68	23 97	4 29	2 14	2 15
Four-year average	51 13	67 5	17 02	21 99	4 96	2 06	2 90
3.—1925	56 12	75 8	19 86	26 42	6 56	2 97	3 59
Four-year average	52 12	74 0	17 30	24 12	6 82	2 80	4 02
4.—1925	56 4	70 12	19 68	24 76	5 08	2 25	2 83
Four-year average	51 10	67 06	16 93	22 01	5 07	2 10	2 97
5.—1925	56 08	73 08	19 77	25 72	5 95	2 56	3 39
Four-year average	51 15	72 05	17 03	23 59	6 05	2 57	3 48
6.—1925	56 08	68 0	19 77	23 80	4 03	1 67	2 36
Four-year average	51 09	67 0	16 92	21 78	4 86	1 84	3 02

The figures in this table indicate that:

1. Crate-fattening cockerels is profitable.
2. Home-grown feeds are quite suitable for crate-fattening.
3. Corn improves the home grown ration, particularly if milk is to be used.
4. Commercial feeds other than corn need not be purchased in order to obtain best results if a supply of the home-grown feeds are available.

5. In every case skim-milk has proven superior to tankage and water in the fattening ration, both from the standpoint of gains made and profits obtained.

6. Reasonably good success may be had from the use of tankage and water if no milk is available.

HATCHING EGGS VERSUS DAY-OLD CHICKS

The object of this experiment is to determine the relative advantage to the farmer from purchasing hatching eggs or day-old chicks. Arrangements were made with the Experimental Station at La Ferme to furnish this Station with sixty eggs for hatching and three weeks later with sixty hatched chicks. In this way a comparison could be made between the cost of obtaining chicks by purchasing the eggs and hatching them under hens and purchasing day-old chicks direct. The folowing table gives the results obtained:—

HATCHING EGGS VERSUS DAY-OLD CHICKS

Items	Hatching eggs	Day old chicks
Date received.....Date	May 1	June 2
Number received.....No.	6 00	60·0
Price..... $	6 00	15 00
Express..... $	0 75	1 43
Cost of hatching..... $	1 00	.....
Total cost..... $	7 75	16 43
Number of chicks alive.....No.	25 0	60·0
Cost per chick..... $	0 31	0 27

These figures would seem to indicate that a farmer would be safer in buying day-old chicks at a cost of twenty-five cents each, in preference to hatching eggs at ten cents each. However, no conclusions should be drawn from one year's figures. The experiment will be repeated another year.

PEDIGREE WORK

The exact egg production of each individual hen is obtained through the medium of the trap-nest. This is used largely as the basis for utility selection. All breeding pens are selected from the trap-nest records together with a certain amount of attention to type of bird and individuality. In this way only those males and females are used for breeding purposes which have pedigrees showing a high standard of production. Particular attention is given to the selection of the males used, and those having high-producing sisters and siring high-producing daughters are retained and used in the flock for several years. This is having a very marked effect upon the egg production of the individual birds and consequently on the entire flock, as may be noted from the following table which gives the total number of birds on hand on December 31, for the last three years with production records of 150 eggs or over.

TABLE SHOWING THE NUMBER OF HENS ON HAND WITH RECORDS OF 150 EGGS OR OVER FOR THE LAST THREE-YEARS

Date Dec. 31	150 eggs or over	175 eggs or over	200 eggs or over	225 eggs or over	250 eggs or over	300 eggs or over	Total
1923.....	19	11	7	.....	.....	.....	37
1924.....	44	24	10	.....	.....	.....	78
1925.....	44	32	24	13	2	1	116

No birds are retained as breeders that have not produced at least 150 or more eggs during their pullet year. It may be noted that the number of high-producers is gradually increasing, particularly those producing from 175 to over 300 eggs.

RATIONS

In the formulating of rations, considerable attention has been given to the use of as large a proportion of home-grown grains, such as wheat, oats, and barley as would be consistent in a good ration. The standard scratch ration in use on the plant at present is made of two parts each of cracked corn and whole wheat 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.

For the evening meal the scratch grain is fed at least an hour before dark, and for the morning meal it is scattered in the litter and partly covered, the evening before, after the birds have gone to roost, so that it is available to them immediately when they leave the roosts in the morning.

In addition to the above, oyster-shell, grit, charcoal and in some cases beef scrap are available to the birds in hoppers at all times.

The green feed used may be mangels, sprouted oats, clover or alfalfa leaves. In fact, the entire plants of clover or alfalfa may be cut up and fed as green feed with success.

BEES

Twenty-three colonies of bees were placed in winter quarters in the autumn of 1924. Sixteen of these were packed in quadruple wintering cases in the bee-yard. The packing used was six inches of well-dried planer shavings on the sides and bottom and twelve inches on top. These sixteen colonies all came through the winter alive, but one was queenless and a second one had a drone-laying queen, which necessitated their being united with two of the other colonies. This left fourteen colonies, spring count, which were all in very good condition and on the average had nearly six frames each of bees.

Of the seven colonies placed in the office cellar, four were doubles, each side having a queen. This was done in an endeavour to overwinter some extra queens to use in queenless colonies in the spring. Unfortunately, however, for some reason these four twin colonies were dead in the spring. The three normal colonies came through in fair condition, the bees covering on the average over five frames in each.

The bees were removed from the cellar on May 20, which was unusually late owing to cold backward weather. When placed in the yard they were packed in three inches of shavings for protection to the brood chamber during the cool nights.

A colony of average strength was placed on scales in order to get data on the daily honey-flow. When this colony was being treated for swarm-control, by the dequeening and requeening method, the new queen developed into a drone-layer, which set the colony back considerably in brood-production and consequently in ability to gather honey. In fact, it had the lowest production of the nine honey-producing colonies. The results obtained are as follows:—

RECORD OF HIVE ON SCALES IN 1925

—	May	June	July	Aug.	Sept.	Total
	lb.	lb.	lb.	lb.	lb.	lb.
Gain	.....	.....	46	41	.....	73·5
Loss	2·5	3·5	.....	.....	7·5	.....

July gave the largest gains, which is usually the case. However, there was not a great deal of difference between the gains made in July and those made in August, while September gave a small loss, indicating that the season was particularly short this year.

White Dutch clover commenced to bloom on June 18, and alsike on June 20. The first gain made by the hive on scales occurred on May 30, which is fairly early. The largest flow of nectar occurred on July 20, but the increase was only 7 pounds which is very light for a maximum flow. August 26, is the latest date on which any gain was recorded.

Nine colonies were used for honey production. The others were used to supply bees and brood for the making of nuclei for the queen-mating yard.

During the season these nine colonies were increased to sixteen by division. The results obtained from the nine colonies are as follows:—

FINANCIAL STATEMENT OF APIARY IN 1925

Total weight of honey extracted from nine colonies		846 lb.
Average weight produced per colony		94 lb.
Selling price of honey per pound	$	0 18
Total value of honey produced	$	152 28
Average value of honey produced per colony	$	16 92

QUEEN-REARING

The success obtained in 1923 and 1924 with queen-mating conducted at this Station, seemed to indicate that the queens could also be successfully reared here and thereby save time and eliminate the danger from loss in transportation, etc. Accordingly, a part of the queen-rearing equipment was transferred from Ottawa, including two queen-breeding and two drone-breeding colonies.

Queenless and broodless colonies were used for starting the queen-cells and the first batch of thirty-nine cells was grafted on June 30.

The virgin queens were introduced to the mating-boxes either as mature cells from the finishing colony or as young queens from the nursery cages. As these were mated and commenced to lay they were distributed to the various Experimental Farms and Stations on instructions received from the Dominion Apiarist.

Careful selection of these queens was practised, so that only the very best were retained.

During the season, 190 queens were reared. Of these, 50 were lost at introduction or during the mating-flight. Fifty-three others were discarded as being unsuitable and 87 were mated.

The season was decidedly unfavourable for queen-rearing the weather being cold, wet and windy. These conditions caused a low acceptance and finishing of cells given. Due to the weather, the young queens were confined to the mating-boxes for long periods before taking their mating-flights. In some cases, 30 days elapsed from the time a cell was given to the time the queen mated. Many queens were lost on their mating-flight from the same cause.

Besides those reared at Kapuskasing, 27 virgin queens were received from Ottawa, 25 of which were alive on arrival. Sixteen of these were successfully mated, which made a total production of 103 mated queens for the season.

As soon as the queen-rearing season was over the bees from the mating-boxes were brought together and united into strong colonies for winter quarters.

On September 21, sixteen colonies were packed in four quadruple wintering-cases, and four colonies, two of which are doubles, having two queens each, in two two-colony wintering-cases in the bee-yard, and ten were placed in the office cellar on November 7. Two of those placed in the cellar are also doubles, each side having a queen.

FIBRE CROPS

FLAX

VARIETY TEST OF FLAX.—Four varieties were under test. The seed was sown on May 20, in triplicate one-fortieth-acre plots, on fall-ploughed sod at the rate of one and one-half bushels per acre. Germination was good but a few of the plots were slightly damaged by rain. The crop was pulled during the week of August 31. The results obtained are as follows:—

VARIETY TEST OF FLAX

Variety	Average height 1925	Yield per acre							
		Green weight 1925		Dry weight 1925		Average green weight 1924-25		Average dry weight 1924-25	
	inches	tons	lb.	tons	lb.	tons	lb.	tons	lb.
Saginaw	34	4	320	1	1,481	7	160	2	1,471
Pure Line No. 5	26	3	1,200	1	1,178	5	400	1	1,449
Riga Blue	29	3	707	1	1,153	5	714	2	487
Longstem	29	4	853	1	1,083	6	1,447	2	942

DATE OF SEEDING FLAX.—The object of this experiment is to determine the date or dates of seeding which would give the best results. The first sowing occurred on May 20, and was repeated on May 27. The results obtained are as follows:—

DATE OF SEEDING FLAX

Date of seeding	Average height 1925	Yield per acre							
		Green weight 1925		Dry weight 1925		Average green weight 1924-25		Average dry weight 1924-25	
	inches	tons	lb.	tons	lb.	tons	lb.	tons	lb.
May 20	29	3	707	1	1,153	5	714	2	487
May 27	31	3	1,787	1	1,508	5	1,434	2	584

HEMP

VARIETY TEST OF HEMP.—Two varieties were under test. The seed was sown on May 15, in triplicate one-fortieth-acre plots on fall-ploughed sod, at the rate of one and one-half bushels per acre. The seed germinated well and a nice stand developed. The results obtained are as follows:—

VARIETY TEST OF HEMP

Variety	Average height 1925	Yield per acre							
		Green weight 1925		Dry weight 1925		Average green weight 1924-25		Average dry weight 1924-25	
	inches	tons	lb.	tons	lb.	tons	lb.	tons	lb.
Chington	73	9	213	3	529	9	207	3	1,065
Minnesota No. 8	71	8	613	2	1,807	7	1,467	2	1,764

DATE OF SEEDING HEMP.—The object of this experiment is to compare the results obtained from different dates of seeding. The first sowing occurred on May 15, and was repeated at intervals of seven days until three different dates were under test. The results obtained are as follows:—

DATE OF SEEDING HEMP

Date sown	Average height 1925	Yield per acre							
		Green weight 1925		Dry weight 1925		Average green weight 1924-25		Average dry weight 1924-25	
	inches	tons	lb.	tons	lb.	tons	lb.	tons	lb.
May 15	73	9	213	3	529	9	207	3	1,065
May 22	71	8	627	2	1,300	7	244	2	1,030
May 29	73	7	920	2	836	6	1,260	2	868

ILLUSTRATION STATIONS

Five Illustration Stations have been operated under the supervision of this Station during the year. These were selected in 1923. The operators and locations of the Stations are as follows: Walter Kirstine, Matheson; H. Labreche, Val Gagné; John MacDonald, Porquis Jct.; E. D. Carrere, Cochrane; Olivier Genier, Genier.

The following four-year rotation has been established on each of these Stations:—

First year.....Hoed crops
Second year.....Grain
Third year.....Clover hay
Fourth year.....Mixed or timothy hay

The Illustration Stations are used as a means for carrying improved farm practices to the farmer. The varieties of cereals that are found to give the best results on the Experimental Station are introduced on these Stations, as well as the best cultural practices. Registered seed grain, certified potatoes, and pure-bred poultry are produced on these Stations and made available to settlers at reasonable prices. Records are kept of the yields, cost of production and profits or losses obtained from the various crops grown in the rotation.

A report on these Stations will be found in the 1925 report of the Chief Supervisor (Eastern Stations).

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