DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
DOMINION EXPERIMENTAL FARMS

EXPERIMENTAL STATION

KAPUSKASING, ONT.

REPORT OF THE SUPERINTENDENT

SMITH BALLANTYNE

FOR THE YEAR 1930

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DOMINION EXPERIMENTAL STATION, KAPUSKASING, ONTARIO

REPORT OF THE SUPERINTENDENT, SMITH BALLANTYNE

THE SEASON

The month of January was colder than usual being 0·1 degree Fahrenheit below the average for a thirteen-year period. February was 4·6, March 1·4, April 0·8, May 4·1, June 3·8, July 0·3, August 3·9, September 1·5, October 3·5, November 7·3 and December 6·1 degrees warmer than the thirteen-year period. The annual mean temperature was 35·6 degrees compared with 32·5 over the same period.

The total precipitation for the year was 30·04 inches, which is 4·24 inches above the average for the thirteen-year period. The snowfall measured 106·5 inches, leaving a total of 19·39 inches of rain for the year. During the five growing months, May 1 to September 30, 16·04 inches fell which equalled 53·40 per cent of the total for the year, while the average amount received during the same months over a period of thirteen years was 13·88 inches or 53·80 per cent.

The snow disappeared quite early in April, but rainfall on the first three days of May kept the ground quite soggy and it was not possible to start seeding until May 12. Cold weather and rain prevented further seeding until May 20. From May 13 to 31 it rained on ten different days, so the spring operations were done under very unfavourable conditions. June was comparatively wet as 4·57 inches were received compared to 2·32 inches over the thirteen-year period. Precipitation in July was 3·08 inches compared to 3·09 inches, while August was much drier, there being 1·76 inches compared to 3·04 inches over the same period.

Fairly good weather prevailed during haying operations as well as in the latter part of August and the first part of September, so the grains matured well and the cutting of grain and silage crops was done under favourable conditions. The latter part of September, however, was extremely wet. From the 13th to the end of the month it rained on fifteen different days, causing a lot of the grain to sprout in the stooks.

The total number of hours of sunshine during the year were 1,557·4, compared to 1,701·5 over a twelve-year period. There were 904·4 hours during the five growing months, May 1 to September 30, compared to 1,023·8 hours over the twelve-year period which represents 58·07 and 60·17 per cent of the total for the year and for the twelve-year period respectively.

The last spring frost occurred on June 6 and the first killing frost in the autumn was on October 3. The length of frost free period being 119 days, the longest in the history of the Station, compared to sixty-seven days over a thirteen-year period.

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Month	Temperature, Degrees Fah.						Precipitation (inches)				Sunshine (hours)	
	Mean		Maximum		Minimum		Rain	Snow	Total precipitation			
	1930	Average thirteen years	Highest	Mean maximum	Lowest	Mean minimum	1930	1930	1930	Average thirteen years	1930	Average twelve years
January	−2·3	−2·2	33	9·8	−40	−14·5	.....	19·5	1·95	1·49	90·7	83·8
February	7·1	2·5	53	22·6	−47	−8·4	0·07	15·0	1·57	0·90	110·4	102·7
March	15·3	13·9	42	27·5	−20	3·1	0·34	31·0	3·44	1·55	107·8	132·3
April	32·1	31·3	62	45·2	−10	19·0	0·85	13·0	2·15	1·84	169·1	172·9
May	49·8	45·7	89	63·9	21	35·6	3·05	.....	3·05	1·90	169·2	217·1
June	60·7	56·9	84	72·8	32	48·7	4·57	.....	4·57	2·32	166·8	229·5
July	61·9	61·6	89	72·9	35	50·9	3·08	.....	3·08	3·09	226·5	233·4
August	63·2	59·3	84	73·5	43	52·9	1·76	.....	1·76	3·04	237·4	204·4
September	52·2	50·7	82	62·3	33	42·0	3·58	.....	3·58	3·53	104·5	139·4
October	42·7	39·2	80	50·5	9	34·8	1·54	3·0	1·84	2·26	83·6	90·6
November	30·5	23·2	53	38·1	−14	22·8	0·55	6·0	1·15	2·05	55·7	46·6
December	13·4	7·3	35	20·9	−25	5·9	.....	19·0	1·90	1·83	35·7	48·8
Year	35·6	32·5	89	46·7	−47	24·4	19·39	106·5	30·04	25·80	1,557·4	1,701·5

ANIMAL HUSBANDRY

DAIRY CATTLE

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

The herd sire, Ottawa Supreme 46th—122068 was born on October 18, 1928, and has developed into a very fine animal. He has been given Class "A" standing in the Advanced Registry for pure-bred Ayrshire bulls. He is sired by Ottawa Supreme 20th—99327—which is a Class "AA" bull. His dam is Ottawa Auchinbay Mina 2nd—86590—daughter of Auchinbay Mina 5th—70080, an imported cow with outstanding qualities.

MILK RECORDS

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

The accompanying table shows the amount of milk produced by each cow that completed a lactation period during the calendar year of 1930, the cost of feed and the value of the milk produced. The profit column is really a comparison between the cost of the feed consumed and the value of the milk produced, as both the labour and the value of the calf are not included.

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

Ensilage, sunflowers, per ton	$ 3 61
Ensilage, O.P.V., per ton	4 88
Roots, per ton	1 75
Hay, per ton	15 00
Meal, per 100 pounds	1 98
Pasture, per day	0 10

The hay and grain are valued at average local market prices, and the value of the silage is arrived at by assuming that 300 pounds of silage containing 25 per cent of dry matter is equal to 100 pounds of hay. On account of the O.P.V. silage containing a higher percentage of dry matter than the sunflower silage, it is given a higher value per ton.

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

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

Name of cow	Age at beginning of lactation period	Date of dropping calf	Number of days in lactation period	Total pounds of milk for period	Daily average yield of milk	Average per cent fat in milk	Pounds of butter produced in period	Value of butter at 40 cents per pound	Value of skim-milk at 50 cents per 100 pounds	Total value of product	Total cost of feed	Feed cost to produce 100 pounds milk	Feed cost to produce 1 pound butter, skim-milk neglected	Profit on cow, labour and calf neglected
	Years	Date	No.	lb.	lb.	%	lb.	$ c.	$ c.	$ c.	$ c.	$	$	$ c.
Pure-bred Ayrshires—														
Ottawa Supreme Trilby—	4	Oct. 24, 1929	229·5	5,088·9	22·17	3·55	212·75	85 10	24 54	109 64	90 21	1·773	0·424	19 43
Blossom of Glenborough	13	Oct. 15, 1929	347·0	7,390·7	21·30	3·50	304·27	121 71	35 66	157 37	126 15	1·707	0·415	31 22
Ena of Glenborough	13	Dec. 1, 1929	279·0	5,711·7	20·47	3·73	250·61	100 24	27 49	127 73	109 47	1·917	0·437	18 26
Ste. Anne Malonie 2nd	5	Jan. 9, 1930	295·0	7,186·4	24·36	3·75	317·06	126 82	34 58	161 40	112 49	1·565	0·355	48 91
Ste. Anne Mignonne 4th	6	Nov. 23, 1929	256·0	6,502·3	25·40	3·53	273·67	109 47	31 35	140 82	112 08	1·724	0·410	28 74
Kap. Kyle Blossom	5	Nov. 4, 1929	279·0	8,475·8	30·38	3·79	378·25	151 30	40 77	192 07	149 80	1·767	0·396	42 27
Kap. Supreme Ena	3	June 15, 1929	333·0	6,232·5	18·72	4·31	316·26	126 50	29 82	156 32	111 41	1·788	0·352	44 91
Brookland Gladys	6	Jan. 8, 1930	306·0	10,785·3	35·25	4·29	544·22	217 69	51 61	269 30	128 61	1·192	0·236	140 69
Kap. Supreme Blossom 2nd	2	Jan. 9, 1930	304·5	6,285·4	20·64	4·03	297·79	119 12	30 16	149 28	114 11	1·815	0·383	35 17
Fancy	6	Jan. 31, 1930	309·5	8,564·3	27·67	4·25	428·47	171 39	41 00	212 39	131 84	1·539	0·308	80 55
Grade Ayrshires—														
Whitie D	2	Nov. 22, 1929	322·5	6,652·2	20·63	4·21	329·55	131 82	31 86	163 68	104 02	1·564	0·316	59 66
Bloomer A 3	3	Dec. 2, 1929	307·0	6,208·0	20·22	3·83	279·66	111 86	29 85	141 71	86 06	1·386	0·308	55 65
Dora B	2	Jan. 20, 1929	383·0	8,007·7	20·91	3·63	342·06	136 82	38 58	175 40	116 43	1·454	0·340	58 97
Whitie C	3	Oct. 14, 1929	302·5	5,812·9	19·22	3·73	255·35	102 14	27 98	130 12	106 13	1·826	0·416	23 99
Dewdrop B 1	2	Sept. 21, 1929	349·0	5,796·0	16·61	4·02	273·81	109 52	27 82	137 34	98 33	1·697	0·359	39 01
Phoebe B 3	2	Aug. 9, 1929	323·5	6,786·6	20·98	4·13	330·09	132 04	32 53	164 57	105 38	1·553	0·319	59 19
Maggie B 2	2	Oct. 4, 1929	357·0	6,925·1	19·40	4·08	332·79	133 12	33 21	166 33	113 17	1·684	0·340	53 15
Dewdrop C	5	Dec. 11, 1929	374·0	12,020·0	32·14	3·87	547·33	218 93	57 77	276 70	167 25	1·391	0·306	109 45
Dewdrop C 1	2	Feb. 7, 1930	317·0	8,700·1	27·45	4·00	409·01	163 60	41 76	205 36	119 35	1·372	0·292	86 01
Pure-bred Shorthorns—														
Kapuskasing Genevieve	4	Nov. 16, 1929	226·0	4,194·4	18·56	4·22	208·20	83 28	20 09	103 37	89 70	2·139	0·431	13 67
Kap. Dictator Red Rose	2	July 4, 1929	329·5	6,969·1	20·96	4·03	330·02	132 01	33 44	165 45	96 17	1·380	0·291	69 28
Brandon Marchioness 30th	4	July 7, 1929	257·5	4,723·9	18·35	3·73	210·28	84 11	22 73	106 84	77 52	1·641	0·369	29 32
Brandon Duchess 3rd	2	Sept. 19, 1929	423·5	5,386·7	13·19	3·87	254·29	101 72	26 85	128 57	107 63	1·927	0·423	20 94
Kap. Prince Red Rose	4	May 15, ...	221·5	4,329·8	19·55	4·37	222·69	89 08	20 70	109 78	100 86	2·329	0·453	8 92
Averages—														
Pure-bred Ayrshires			293·9	7,222·3	24·57	3·91	332·34	132 93	34 70	167 63	118 62	1·642	0·357	49 01
Grade Ayrshires			337·3	7,434·3	22·04	3·94	344·41	137 76	35 71	173 47	112 90	1·519	0·328	60 57
Pure-bred Shorthorns			292·2	5,160·8	17·66	4·04	245·10	98 04	24 76	122 80	94 38	1·629	0·385	28 43

SILAGE VERSUS NO SILAGE FOR MILK PRODUCTION

The object of this experiment is to determine the value of silage for milk production. For this experiment the cows selected were in such stage of lactation that each would continue milking throughout the four twenty-eight day periods which the experiment was to cover. The experiment commenced on December 10, 1929.

The animals were divided this year into two groups in order to check up the influence in changing from one food to another. The first group received silage while the second group received no silage. For instance, in the first group they were receiving silage in periods one and three and no silage in periods two and four, while in the second group they were receiving no silage in periods one and three and silage in periods two and four.

When no silage was fed the ration consisted of 21 pounds of hay and a grain ration composed of five parts each of bran, barley, and oats and two parts of oil cake meal, and when silage was fed 11 pounds of the hay was replaced with 45 pounds of sunflower silage and the grain ration consisted of four parts of bran, three of oats and one of oil cake meal. The change in the quantity of hay and the meal mixture was necessary in order not to materially change the amount of dry matter or alter the protein content and nutritive ratio of the two rations.

Seven days were taken to transfer from one ration to the other at the beginning of each period. The milk records are calculated on the last fourteen days in each twenty-eight day period, so that the cows are really one full week on the new ration before the milk yields are considered. The accompanying table shows the figures for 1930 as well as the average for two years:—

SILAGE VERSUS NO SILAGE FOR MILK PRODUCTION

Items		Average results for 1930		Two-year average	
		Silage, sunflowers	No silage	Silage, sunflowers	No silage
Number of cows in test	No.	18	18	13	13
Pounds of milk produced *first* 7 days	lb.	2,641·00	2,697·90	2,014·22	2,043·03
Pounds of milk produced *second* 7 days	"	2,541·65	2,574·00	1,948·05	1,975·09
Pounds of milk produced *third* 7 days	"	2,501·15	2,426·30	1,912·32	1,888·91
Pounds of milk produced *fourth* 7 days	"	2,523·05	2,438·85	1,909·21	1,869·24
Total pounds of milk in last 14 days	"	5,024·20	4,865·15	3,821·53	3,758·15
Average milk per cow per day	"	19·94	19·31	21·00	20·65
Average per cent fat in milk	%	3·73	3·95	3·74	3·89
Pounds of fat produced in last 14 days	lb.	187·27	191·98	142·91	146·22
Average pounds of fat per cow per day	"	0·74	0·76	0·79	0·80
Meal consumed in 14 days	"	2,478·00	2,730·00	1,764·00	1,890·00
Hay consumed in 14 days	"	2,520·00	5,292·00	1,932·00	3,766·00
Silage (sunflowers) consumed in 14 days	"	11,340·00	.....	8,190·00	.....
Meal consumed per 100 pounds milk produced	"	49·32	56·11	46·16	50·29
Hay consumed per 100 pounds milk produced	"	50·16	108·77	50·56	100·21
Silage (sunflowers) consumed per 100 pounds milk produced	"	225·71	.....	214·31	.....
Meal consumed per 100 pounds fat produced	"	1,323·22	1,422·02	1,234·34	1,292·57
Hay consumed per 100 pounds fat produced	"	1,345·65	2,756·54	1,351·90	2,575·57
Silage (sunflowers) consumed per 100 pounds fat produced	"	6,055·43	.....	5,730·88	.....
Finding from Experiment					
Cost of meal mixture	$	51 05	56 24	36 03	39 15
Value of hay fed	$	18 90	36 69	14 16	27 69
Value of silage (sunflowers) fed	$	20 46	.....	14 64	.....
Total cost of feed	$	90 41	95 93	64 83	66 84
Feed cost to produce 100 pounds of milk	$	1 80	1 97	1 70	1 78
Feed cost to produce 100 pounds of fat	$	48 28	49 97	45 36	45 71

DEDUCTION.—Over a two-year average the figures in this table would seem to indicate that the feeding of silage would slightly increase the quantity and reduce the cost of milk and fat production. The point to note in the above experiment is that where silage is not available quite economical results can be obtained with hay and a grain mixture, provided that the ration is a properly balanced one. This is particularly true if the hay is made up largely of legumes, such as red clover and alsike clover.

FEED COST OF REARING AYRSHIRE AND SHORTHORN CATTLE

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

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

FEED COST OF REARING AYRSHIRE AND SHORTHORN CATTLE

Breed and age	Number of animals	Whole milk	Skim-milk	Meal	Hay	Straw	Silage	Roots	Pasture	Cost
	No.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	days	$
Ayrshire females—										
To one year	53	665	2,375	579	1,138	.....	2,244	15	69	54 51
To two years	41	676	2,467	859	2,995	111	8,508	49	205	96 75
To freshening	36	691	2,483	1,145	4,291	225	12,267	175	284	125 88
Ayrshire males—										
To six months	29	751	1,967	271	467	.....	366	.....	.....	34 71
To one year	7	754	2,553	1,075	1,850	.....	1,850	79	3	68 44
Shorthorn females—										
To one year	18	703	2,099	593	1,112	14	2,082	.....	76	53 31
To two years	14	739	2,142	945	3,041	114	7,447	144	223	96 12
To freshening	11	754	2,175	1,109	6,506	146	12,398	73	297	127 46

A consideration of these figures emphasizes the very great importance of using only the best sires available and also of selecting the heifer calves from the highest testing and highest producing dams. It would appear as though the dairy man cannot afford to rear anything but the very best of the grade heifer calves.

BEEF CATTLE

The herd of beef cattle totals twenty-three head. Of this number thirteen are milking cows, six heifers, two bull calves and two bulls. Four cows and three heifers of milking strain were transferred to this Station from the Brandon Experimental Farm in order to replenish the herd.

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

SHEEP

Pure-bred Shropshire is the breed of sheep kept at this Station. At the present time the breeding flock consists of twenty-eight ewes, nine ewe lambs, one ram and four ram lambs.

During the year thirty-one lambs were born. The average number of lambs born per ewe in 1930 was 1·19 while the average over a twelve-year period is 1·50. The average number raised is 1·08 for the year and 1·17 for the twelve-year period.

Although the sheep do well in this climate the danger of attack by dogs has always prevented extensive raising. Over a period of twelve years, seventy sheep have been killed by dogs and it has been found necessary to put the entire flock in a dog-proof wire corral every night during the pasture season, and even with this precaution the sheep have been severely mauled during the day on several occasions.

SWINE

Pure-bred Yorkshire is the only breed of hogs kept at this Station. The herd of breeding stock on December 31 consisted of eleven sows and one boar. The boar is Ottawa Alexander 342 —144568—, a very good type of bacon hog. He is sired by Parkdale Farm Ruler —135606— which was bred by A. Dynes. His dam is Ottawa Alexandra 204 —104999—, which was bred by Director, Experimental Farms, Ottawa, and is from an imported sire.

During the year fourteen litters were farrowed which gave 157 pigs. Of this number, ninety-nine were raised to breeding age. As there was a good demand for pigs, most of these were sold to farmers at reasonable prices.

FEED COST OF MAINTAINING BROOD SOWS

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

The following table shows the figures for 1930 as well as the average for a ten-year period:—

FEED COST OF MAINTAINING BROOD SOWS

Items		1930	Ten-year average 1921–30
Number of sows	No.	6	10·5
Total grain consumed	lb.	16,293	27,045
Average grain per sow	"	2,716	2,576
Average grain per sow per month	"	226	215
Total cost of feed	$	370 06	541 88
Average cost of feed per sow	$	61 68	51 61
Average cost of feed per sow per month	$	5 14	4 29

FEED COST OF REARING PIGS TO TIME OF WEANING

A record is kept of feed consumed by each sow from the time one litter is weaned until the next litter is ready to wean. From these data the feed cost of maintaining the sow from weaning to farrowing and the feed cost of rearing the pigs to time of weaning may be calculated. The accompanying table shows the figures for 1930 as well as the average for a seven-year period.

FEED COST OF REARING PIGS TO TIME OF WEANING

Items		1930	Seven-year average 1924–30
From weaning to farrowing—			
Number of sows	No.	14	17·7
Average length of period	days	149·4	173·0
Total grain consumed	lb.	14,023·0	19,616·0
Average grain per sow	"	1,001·6	1,108·2
Total cost of feed	$	328 56	417 35
Average cost of feed per sow	$	23 47	23 58
Total service fee	$	28 00	35 43
Total cost	$	356 56	452 78
Average cost per sow	$	25 47	25 58
From farrowing to weaning—			
Number of sows	No.	13	17·1
Average length of period	days	47·4	55·4
Total grain consumed	lb.	6,101·0	10,890·3
Average grain per sow	"	469·3	636·9
Total cost of feed	$	142 74	234 26
Average cost of feed per sow	$	10 98	13 70
Deductions—			
Total number of pigs born	No.	157	184
Average number of pigs born per sow	"	11·2	10·4
Total number of pigs raised	"	99	135
Average number of pigs raised per sow	"	7·1	7·6
Total cost	$	498 30	686 89
Total cost per sow	$	36 45	39 28
Average cost per pig to time of weaning	$	5 03	5 09

The factors affecting the cost of rearing pigs to weaning age are: (1) The number of litters produced by each sow per year; (2) the number of pigs born in each litter and (3) the percentage of those born which are successfully reared. The number of pigs born in each litter may be partially controlled by the proper selection of the most prolific breeding stock and also by the condition of the sow at time of service, while the percentage of those born which are successfully reared may depend largely on the judicious care, feeding and handling of the sow during the gestation period and of both the sow and litter during the nursing period.

HORSES

At the present time twenty-two horses are kept at this Station. Sixteen of these are heavy work-horses. Five are pure-bred French Canadians, one mare, one four-year-old stallion, one two-year-old filly and two suckling colts, and one grade suckling colt.

No experimental work is carried on but records are kept of the feed consumed and the number of hours of work performed by each horse. From these data are calculated the feed cost of maintenance and the feed cost of horse labour per hour.

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

Items		1930	Eight-year average
Average number of horses fed	No.	15·7	15·2
Total hours worked	"	37,418	39,697
Average hours per horse	"	2,383	2,612
Average hours per horse per day	"	7·9	8·7
Total hay fed	lb.	105,091	106,079
Total grain fed (including bran)	"	90,496	86,781
Total days on pasture	No.	84	58
Average hay fed per horse	lb.	6,694	6,979
Average grain per horse (including bran)	"	5,764	5,709
Average days on pasture per horse	No.	5·4	3·8
Average hay per horse per day	lb.	18·3	19·1
Average grain per horse per day (including bran)	"	15·8	15·6
Findings—			
Cost of hay consumed	$	788 18	761 04
Cost of grain consumed	$	1,664 84	1,753 25
Cost of pasture	$	8 40	5 78
Total cost of feed	$	2,461 42	2,520 07
Average cost of feed per horse	$	156 78	165 79
Average cost of horse labour per hour	cents	6·6	6·3

FIELD HUSBANDRY

ROTATION OF CROPS

In order to obtain some definite information in regard to the most practical and suitable rotations to use in Northern Ontario, an experiment in crop rotations was established in 1922. In this experiment one acre is included for each year that the rotation covers, making three acres for a three-year rotation, four acres in a four-year rotation, and so on. The area on which these rotations are established is a clay-loam soil which is apparently fairly uniform, although a few narrow strips of shallow muck are present. These are running crosswise of the rotation, however, and therefore should not materially affect the accuracy of the test.

In arriving at the cost of production figures, a record is kept of all items involved and a value is set on all products produced. These form a basis by which to compare the rotations. In determining these costs, actual prices are used wherever possible, such as the cost of labour, seed, twine, etc.

The rent of the land is arrived at by multiplying the value of the land by the current rate of interest, on first mortgage plus taxes. The charge for machinery includes interest on investment, depreciation charges and a percentage for repairs. The cost of horse labour is calculated on the basis of the cost of maintenance for one year divided by the number of hours' work done.

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

The prices and return values used in the 1930 report are as follows:—

PRICES USED IN FIGURING COST OF PRODUCING CROPS

Expenses

Rent	per acre	$ 4 75
Use of machinery	per acre	2 85
Manure	per ton	1 50
Threshing (oats, barley)	per bushel	0 07
Threshing (wheat)	per bushel	0 15
Ensiling	per ton	0 71
Manual labour	per hour	0 30
Teamsters	per hour	0 32
Horse labour (single)	per hour	0 10
Tractor and operator	per hour	1 55
Potatoes	per bushel	2 85
Turnip seed	per pound	0 65
Barley	per bushel	1 50
Wheat (spring)	per bushel	1 75
Oats	per bushel	1 35
Peas	per bushel	3 15
Vetch	per bushel	5 05
Sunflower seed	per pound	0 12
Timothy	per pound	0 12
Red clover	per pound	0 20
Alsike	per pound	0 18
Alfalfa	per pound	0 59
Sweet clover	per pound	0 14
Twine	per pound	0 16

Return Values

Peas	per bushel	$ 3 00
Barley	per bushel	0 60
Wheat	per bushel	1 15
Oats	per bushel	0 50
Potatoes (marketable)	per bushel	0 90
Potatoes (unmarketable)	per ton	2 10
Hay	per ton	14 00
Straw (barley, oats)	per ton	5 60
Straw (wheat)	per ton	2 80
Sunflower silage	per ton	3 89
O.P.V. silage	per ton	4 32
Turnips	per ton	2 10

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

ROTATION A (THREE YEARS' DURATION)

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

ROTATION A (THREE YEARS' DURATION)—RESULTS IN 1930

Rotation year	Crop	Yield per acre		Value of crop	Cost of production	Profit or loss per acre	
		1930	Average six years	1930	1930	1930	Average six years
				$	$	$	$
1	Sunflowers ton	8·28	9·02	32 21	38 21	−6 00	−10 72
2	Oats (Alaska) straw ton	0·73	0·69				
	Oats (Alaska) grain bush.	30·9	28·4	19 54	26 27	−6 73	− 5 24
3	Clover hay ton	1·13	1·50	15 82	16 71	−0 89	1 59
	Average per acre			22 52	27 06	−4 54	− 4 79

ROTATION B (FOUR YEARS' DURATION)

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

ROTATION B (FOUR YEARS' DURATION)—RESULTS IN 1930

Rotation year	Crop	Yield per acre		Value of crop 1930	Cost of production	Profit or loss per acre	
		1930	Average six years			1930	Average six years
				$	$	$	$
1	Sunflowers ton	10·55	10·56	41 04	32 57	8 47	−6 44
2	Oats (Alaska) straw ton	0·70	0·66	.....	.....	.....	.....
	Oats (Alaska) grain bush.	38·5	29·6	23 17	28 24	−5 07	−7 49
3	Clover hay ton	1·12	1·47	15 68	16 88	−1 20	1 45
4	Timothy hay ton	1·94	1·64	27 16	12 98	14 18	7 96
	Average per acre	.....	.....	26 76	22 66	4 10	−1 13

ROTATION C (FIVE YEARS' DURATION)

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

ROTATION C (FIVE YEARS' DURATION)—RESULTS IN 1930

Rotation year	Crop	Yield per acre		Value of crop 1930	Cost of production	Profit or loss per acre	
		1930	Average six years			1930	Average six years
				$	$	$	$
1	Oats (Alaska) straw ton	0·89	0·89	.....	.....	.....	.....
	Oats (Alaska) grain bush.	34·7	36·6	22 33	25 20	−2 87	0 97
2	Sunflowers ton	9·84	10·90	38 28	39 92	−1 64	−4 93
3	Barley straw ton	0·66	0·74	.....	.....	.....	.....
	Barley grain bush.	26·5	29·3	19 60	25 75	−6 15	1 98
4	Clover hay ton	1·67	1·50	23 38	16 44	6 94	2 99
5	Timothy hay ton	1·93	1·78	27 02	17 54	9 48	4 72
	Average per acre	.....	.....	26 12	24 97	1 15	1 14

ROTATION D (SIX YEARS' DURATION)

This rotation includes potatoes, wheat, barley, clover hay and timothy hay for two years. The timothy sod is manured at the rate of 16 tons per acre and fall-ploughed for potatoes. After the potatoes are dug, the land is again fall-ploughed for wheat, and is also fall-ploughed for barley, which is the nurse-

crop for seeding out with. The new seeding is given a top dressing of manure at the rate of 8 tons per acre after the barley is harvested. The results from the different crops are as follows:—

ROTATION D (SIX YEARS' DURATION)—RESULTS IN 1930

Rotation year	Crop	Yield per acre		Value of crop	Cost of production	Profit or loss per acre	
		1930	Average six years	1930		1930	Average six years
				$	$	$	$
1	Potatoes unmarketable..... ton	0·77	0·45	.....	.....	.....	.....
	Potatoes marketable..... bush.	77·7	117·4	71 55	103 68	—32 13	45 99
2	Wheat straw..... ton	1·14	1·13	.....	.....	.....	.....
	Wheat grain..... bush.	19·9	19·7	26 07	28 77	— 2 70	—0 61
3	Barley straw..... ton	0·57	0·76	.....	.....	.....	.....
	Barley grain..... bush.	22·4	26·4	17 83	24 69	— 6 86	0 84
4	Clover hay..... ton	0·96	1·46	13 44	18 95	— 5 51	—0 65
5	Timothy hay..... ton	2·23	1·70	31 22	14 82	16 40	7 15
6	Timothy hay..... ton	1·51	1·50	21 14	13 01	8 13	6 70
	Average per acre.....	.....	.....	30 20	33 98	— 3 78	9 90

ROTATION F (FIVE YEARS' DURATION)

This rotation includes oats, barley, alfalfa and clover hay and alfalfa and timothy hay for two years. The sod is fall-ploughed for the oat crop. After the oat crop is harvested the land is again fall-ploughed in preparation for barley which is used as a nurse-crop for seeding out with at the following rate per acre: alfalfa 10, red clover 5, alsike clover 2, and timothy 3 pounds. Manure is disked in at the rate of 10 tons per acre for the barley and another application of 10 tons is applied as a top dressing after the first-year meadow is harvested. As this rotation has been in operation for a period of only two years there are no results to publish at present.

COST OF PRODUCING FARM CROPS

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

COST OF PRODUCING SPRING WHEAT (GARNET)

The figures used in determining the cost of producing spring wheat represent one acre which was grown in the six-year rotation and 2·25 acres under ordinary field crops. The 2·25 acres were seeded on May 12 and the other acre on May 21 at the rate of 2 bushels per acre. The germination was good and a nice stand developed. The 2·25 acres were harvested on September 2, and the one acre on September 10. The cost of production is as follows:—

Total cost per acre	$24 88
Yield of grain per acre.....bush.	24·74
Yield of straw per acre.....ton	1·43
Value of crop per acre	$32 45
Profit per acre	7 57
Cost per bushel	0 88
Cost per ton of straw	2 15

COST OF PRODUCING ALASKA OATS

The figures on the cost of producing Alaska oats are based on 58·2 acres, 10 of which were grown in the rotations and cultural experiments. The seed was sown from May 20 to 27, at the rate of 2½ bushels per acre. The germination was rather poor and a very uneven stand developed. This might explain the very low yields obtained and the high cost of production. The crop matured well and was harvested from September 2 to 10. The quality of the grain was also good. The cost of production is as follows:—

Total cost per acre	$22 99
Yield of grain per acre.....bush.	21·2
Yield of straw per acre.....ton	0·41
Value of crop per acre	$12 88
Loss per acre	10 12
Cost per bushel	0 89
Cost per ton of straw	10 00

COST OF PRODUCING BARLEY

The area in barley included 34·6 acres, 3 of which were in the rotations, 11 in the cultural experiments, and 20·6 in the regular field crop area. The seed was sown from May 22 to 30, at the rate of 2 bushels per acre, and harvested from September 2 to 10. O.A.C. No. 21 was the variety used. The cost of production is as follows:—

Total cost per acre	$22 40
Yield of grain per acre.....bush.	21·0
Yield of straw per acre.....ton	0·47
Value of crop per acre	$15 23
Loss per acre	7 17
Cost per bushel	0 88
Cost per ton of straw	8 23

COST OF PRODUCING HAY

The cost of production figures for hay include 25 acres in the rotations and cultural experiments and 97·5 acres in the field areas. Haying commenced on July 21 and the cutting was completed on August 6. The cost of production is as follows:—

Total cost per acre	$13 77
Yield per acre.....ton	1·14
Value per acre	$15 96
Profit per acre	2 19
Cost per ton	12 08

The standard hay mixture used is red clover 8 pounds, timothy 8 pounds, and alsike 2 pounds per acre. As the first-year meadow is usually largely red clover the cost of the red clover seed is charged against the first hay crop, and the cost of the alsike clover and timothy seed is equally distributed among all of the hay years in the rotation.

THE COST OF PRODUCING SUNFLOWERS

The figures on the cost of producing sunflowers are based on 4 acres, 3 of which were grown on the rotations and 1 on cultural experiments. The seed was planted on May 20 in rows 36 inches apart and the crop was harvested on September 11. The cost of production is as follows:—

Total cost per acre	$39 44
Yield per acre.....ton	8·37
Value per acre	$32 58
Loss per acre	6 86
Cost per ton	4 71

COST OF PRODUCING OATS AND PEAS MIXTURES

The area from which these figures have been obtained includes one acre in the cultural experiment and 40 acres under field crop. The seed was sown on May 20 to June 2, and the crop harvested and ensiled from August 26 to September 1. The cost of production is as follows:—

Total cost per acre	$28 31
Yield per acre	3·11 ton
Value per acre	$13 43
Loss per acre	14 88
Cost per ton	9 10

CULTURAL EXPERIMENTS

DATE OF SEEDING FALL WHEAT

The object of this experiment is to determine which date or dates of seeding will give the best results. In 1929 the seed was sown on six different dates at intervals of seven days, commencing on August 19, in quadruplicate one-fortieth-acre plots, at the rate of 2 bushels per acre. Kharkov was the variety used. The results are as follows:—

DATE OF SEEDING FALL WHEAT—RESULTS IN 1930

	Date sown											
	Aug. 19		Aug. 26		Sept. 2		Sept. 9		Sept. 16		Sept. 23	
	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.
Yield per acre—1930	15	20	6	10	4	0	1	0	..	..	..	..
Yield per acre—average four years	22	8	18	30	16	33	12	33	9	43	9	40

DATE OF SEEDING FALL RYE

The object of this experiment is to determine which date or dates of seeding will give the best results. In 1929 the seed was sown on six different dates at intervals of seven days, commencing on August 19, in quadruplicate one-fortieth-acre plots at the rate of 1½ bushels per acre. Common fall rye was the variety used. The results are as follows:—

DATE OF SEEDING FALL RYE—RESULTS IN 1930

	Date sown											
	Aug. 19		Aug. 26		Sept. 2		Sept. 9		Sept. 16		Sept. 23	
	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.
Yield per acre—1930	28	12	21	44	24	6	16	24	11	34	12	8
Yield per acre—average five years	29	33	28	5	25	13	22	32	21	5	20	33

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 1930 twelve different rates were under test. The seed was sown on June 10, in quadruplicate

one-fortieth-acre plots on fall-ploughed clay-loam soil which was manured at the rate of 16 tons per acre for the previous crop. The germination was good and a nice stand developed. The results are as follows:—

RATE OF SEEDING SUNFLOWERS—RESULTS IN 1930

Distance between rows	Distance between plants in rows	Area occupied by each plant	Yield per acre			
			Results 1930		Average–1924–1930	
			Green weight	Dry weight	Green weight	Dry weight
in.	in.	sq. ft.	ton lb.	ton lb.	ton lb.	ton lb.
24	6	1·0	10 1,770	1 898	13 399	1 1,666
24	12	2·0	9 590	1 634	12 61	1 1,222
24	18	3·0	7 970	1 256	10 740	1 788
30	6	1·25	10 1,680	1 1,104	13 615	1 1,487
30	12	2·50	11 190	1 1,107	12 46	1 1,130
30	18	3·75	8 1,500	1 327	10 1,618	1 862
36	6	1·50	12 480	1 1,507	13 637	1 1,401
36	12	3·00	10 980	1 1,045	12 287	1 1,171
36	18	4·50	8 1,580	1 366	10 903	1 787
42	6	1·75	10 990	1 947	12 1,642	1 1,366
42	12	3·50	7 1,890	1 237	10 1,610	1 844
42	18	5·25	6 1,150	0 1,851	9 564	1 323

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

It may be noticed in the average results of dry weight per acre over a seven-year period that in every case where the spacing of the plants in the row has been changed from 6 to 12 and 18 inches there has been a noticeable decrease in the yield; while on the other hand the variations in the yield have not been so marked where the rows are widened from 24 to 30, 36 to 42 inches apart.

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

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

Distance	Yield per acre			
	Results 1930		Average 1924-30	
	Green weight	Dry weight	Green weight	Dry weight
	ton lb.	ton lb.	ton lb.	ton lb.
Rows 24 inches apart	9 443	1 596	11 1,733	1 1,225
Rows 30 inches apart	10 457	1 846	12 93	1 1,160
Rows 36 inches apart	10 1,013	1 973	11 1,942	1 1,120
Rows 42 inches apart	8 677	1 345	10 1,939	1 845
Plants 6 inches apart	11 230	1 1,114	13 324	1 1,480
Plants 12 inches apart	9 1,413	1 756	11 1,501	1 1,092
Plants 18 inches apart	7 1,800	1 200	10 456	1 690

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

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

THINNED VERSUS UNTHINNED SUNFLOWERS

In order to determine the value of thinning the sunflowers, an experiment was started in 1925 comparing the two methods. In 1930, the seed was sown on June 10 in quadruplicate one-fortieth-acre plots, in rows 30 inches apart, on fall-ploughed sod which was manured at the rate of 16 tons per acre previous to ploughing. The results are as follows:—

THINNED VERSUS UNTHINNED SUNFLOWERS

Distance	Yield per acre							
	1930				Average 1925-30			
	Green weight		Dry weight		Green weight		Dry weight	
	ton	lb.	ton	lb.	ton	lb.	ton	lb.
Plants thinned 6 inches apart	10	1,230	1	1,010	10	1,818	1	1,053
Plants not thinned	12	160	1	1,282	12	51	1	1,506

It may be noticed from this table over a six-year period that the thinning of sunflowers has failed to increase the yield per acre of both the green and dry matter. In fact there is a material difference in favour of the unthinned, and this method is to be recommended in preference to the other.

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 1930, twenty different mixtures and rates of seeding were under test. These were all seeded in quadruplicate one-fortieth-acre plots on fall-ploughed clay-loam soil which had been manured at the rate of 16 tons per acre previous to ploughing. The O.P.V. was sown on May 29, the sunflowers on June 10, and the corn on June 12. The O.P.V. was harvested on September 4, the corn on September 9, and the sunflowers on September 12. Mammoth Russian sunflowers, Northwestern Dent corn, Banner oats, Mackay peas and Common vetch were the varieties used. The germination of all three crops was good and a nice stand developed. The results are as follows:—

DISTANCE BETWEEN ROWS AND RATE OF SEEDING ENSILAGE CROPS

Crops and rate						Yield per acre							
						Results 1930				Average 1924-30			
Sunflowers	Corn	Oats	Peas	Vetch	Clover	Green weight		Dry weight		Green weight		Dry weight	
in.	in.	lb.	lb.	lb.	lb.	ton	lb.	ton	lb.	ton	lb.	ton	lb.
24	.....	.....	.....	.....	.....	9	760	1	439	15	779	1	1,824
30	.....	.....	.....	.....	.....	12	1,480	1	1,361	15	880	1	1,808
36	.....	.....	.....	.....	.....	11	230	1	777	14	806	1	1,693
42	.....	.....	.....	.....	.....	9	1,090	1	470	12	636	1	1,092
.....	24	.....	.....	.....	.....	7	600	0	1,870	5	201	0	1,230
.....	30	.....	.....	.....	.....	7	510	0	1,917	4	1,769	0	1,199
.....	36	.....	.....	.....	.....	6	1,100	0	1,726	4	417	0	1,052
.....	42	.....	.....	.....	.....	5	1,470	0	1,519	3	998	0	856
.....	.....	34	60	.....	.....	7	620	1	1,353	9	1,154	2	565
.....	.....	51	60	.....	.....	6	1,790	1	1,690	9	973	2	718
.....	.....	68	60	.....	.....	8	520	2	538	9	1,215	2	964
.....	.....	34	60	28	.....	9	1,690	2	555	11	305	2	952
.....	.....	51	60	28	.....	10	70	2	260	11	942	2	1,180
.....	.....	68	60	28	.....	9	320	2	328	11	62	2	1,039
.....	.....	34	60	.....	10	8	980	1	1,795	10	30	2	747
.....	.....	51	60	.....	10	8	1,550	2	240	9	1,991	2	839
.....	.....	68	60	.....	10	8	670	1	1,729	9	1,406	2	842
.....	.....	34	60	28	10	9	900	1	1,862	10	1,809	2	743
.....	.....	51	60	28	10	9	500	2	130	10	1,920	2	979
.....	.....	68	60	28	10	9	1,040	2	566	10	1,468	2	1,112

The average figures of dry weight over a seven-year period show that the largest yield has been obtained from rows 24 inches apart and the smallest yield from rows 42 inches apart with both sunflowers and corn. However, the difference in yield between rows 24 inches and 30 inches is not great, and 24 inches apart has been found to be an inconvenient distance for cultivating and harvesting. Consequently, either 30 or 36 inches is to be preferred to either of the other two.

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

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

Plots averaged	Yield per acre			
	Average 1924-30			
	Green weight		Dry weight	
	ton	lb.	ton	lb.
Where 34 pounds of oats are included (4 plots)	10	825	2	752
Where 51 pounds of oats are included (4 plots)	10	957	2	929
Where 68 pounds of oats are included (4 plots)	10	538	2	989
Where oats and peas are sown (3 plots)	9	1,114	2	749
Where oats, peas and vetch are sown (3 plots)	11	436	2	1,057
Where oats, peas and clover are sown (3 plots)	9	1,809	2	809
Where oats, peas, vetch and clover are sown (3 plots)	10	1,732	2	945

The figures in this table indicate that there is some tendency for the yield to increase as the amount of oats included in the mixture has been increased. The figures also show some advantage where the vetch is present, but the addition of the clover has failed to augment the yield.

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

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 30 inches apart and the sunflowers were thinned 6 to 12 inches apart in the row, while the oats, peas and vetch were sown at the rate of 2 bushels of oats, 1 bushel of peas and $\frac{1}{2}$ bushel of vetch per acre. Mammoth Russian sunflowers, Quebec 28 corn, Banner oats, Mackay peas and Common vetch were the varieties used.

In 1930 the seed was sown on six different dates at intervals of seven days commencing on May 28, on fall-ploughed clay-loam soil which was manured at the rate of 16 tons per acre previous to ploughing. The sunflowers and O.P.V. were sown in quadruplicate one-fortieth-acre plots and the corn in one-eightieth-acre plots. The results to date are as follows:—

DATES OF SEEDING ENSILAGE CROPS

Crop	Date of seeding 1930	Yield per acre							
		Results 1930				Average 1924-30			
		Green weight		Dry weight		Green weight		Dry weight	
		ton	lb.	ton	lb.	ton	lb.	ton	lb.
Sunflowers	May 28	16	910	2	710	18	1,560	2	1,100
Sunflowers	June 4	14	750	2	102	17	1,129	2	521
Sunflowers	June 11	13	1,410	1	1,405	16	1,934	2	175
Sunflowers	June 18	13	570	1	974	15	727	1	1,494
Sunflowers	June 25	10	1,050	1	447	13	627	1	1,076
Sunflowers	July 2	10	800	1	122	11	117	1	438
O.P.V.	May 28	12	1,250	2	1,213	12	613	2	1,734
O.P.V.	June 4	10	1,630	2	413	12	467	2	1,440
O.P.V.	June 11	9	340	1	1,409	11	1,969	2	910
O.P.V.	June 18	8	1,900	1	820	11	1,599	2	456
O.P.V.	June 25	7	1,050	1	287	11	1,180	2	35
O.P.V.	July 2	8	720	1	508	11	397	2	50
Corn*	May 28	8	660	1	383	6	1,847	0	1,793
Corn	June 4	6	1,140	0	1,737	5	1,692	0	1,476
Corn	June 11	5	280	0	1,247	5	1,172	0	1,353
Corn	June 18	2	1,060	0	594	4	1,323	0	1,127
Corn	June 25	1	1,280	0	393	3	793	0	800
Corn	July 2	2	200	0	466	2	1,147	0	631

*The corn in this experiment failed to germinate in 1927 and consequently the average figures for this crop are for six-year period.

The figures in this table indicate that there is a general tendency for the earlier seedings of sunflowers, corn and O.P.V. to give the better results. In fact, over a seven-year period the first seeding has given the largest yields. In this connection, however, it is interesting to note that the O.P.V. may be sown until late and still give fairly good results.

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 has never received any fertilizer of any kind. It is operated on a five-year rotation including oats, sweet clover, barley, clover hay, and timothy hay. The land is fall-ploughed for the oat crop. When the sweet clover has obtained a fair growth it is ploughed under, and the land is cultivated occasionally throughout the remainder of the season. The results from the different crops are as follows:—

PLOUGHING DOWN SWEET CLOVER AND SUMMER-FALLOWING—RESULTS IN 1930

Rotation year	Crops and treatment	Yield per acre		Cost of summer-fallowing, 1930	Value of crop minus cost of summer-fallowing	
		1930	Average 6 years		1930	Average 6 years
				$	$	$
1	Oats (Alaska) straw ton	0·44	0·58	.....	.....	.....
	Oats (Alaska) grain bush.	22·1	21·9	.....	13 51	18 83
2	Sweet clover ploughed down and summer-fallowed	.....	.....	.....	.....	.....
3	Barley straw ton	0·62	0·74	.....	.....	.....
	Barley grain bush.	25·8	22·6	12 59	6 36	16 13
4	Clover hay ton	0·71	0·96	6 30	3 64	9 41
5	Timothy hay ton	0·89	1·00	.....	12 46	14 17
	Average per acre	.....	.....	18 89	7 19	11 71

PLOUGHING DOWN SWEET CLOVER AND ADDING COMMERCIAL FERTILIZER

The object of this experiment is to determine the value, if any, of sweet clover as a green manure when used in conjunction with summer-fallow and commercial fertilizers. This experiment was started in 1929 on virgin clay-loam soil and is operated on a five-year rotation, including oats, sweet clover, barley, clover hay and timothy hay. The land is fall-ploughed for the oat crop. When the sweet clover has attained a fair growth it is ploughed under, and the land is cultivated occasionally throughout the remainder of the season in preparation for barley the next year which is the nurse-crop for the grass and clover. The fertilizers are applied as follows: barley, nitrate of soda 100, and superphosphate 300 pounds per acre; clover hay, nitrate of soda 100, and muriate of potash 75 pounds per acre; timothy, nitrate of soda 100 pounds per acre.

As this new rotation has not yet completed one full cycle no figures are yet available for publication.

NO GREEN MANURE CROP PLOUGHED DOWN

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

No Green Manure Crop Ploughed Down—Results in 1930

Rotation year	Crop		Yield per acre		Value of crop	
			1930	Average 4 years	1930	Average 4 years
					$	$
1	Peas	straw ton	.....	0·40	.....	.....
		grain bush.	Failure	10·6	.....	30 91
2	Barley	straw ton	0·37	0·58	.....	.....
		grain bush.	15·2	18·6	11 19	21 33
3	Clover hay	ton	0·13	0·39	1 82	5 91
4	Timothy hay	ton	0·46	0·68	6 44	10 23
	Average per acre		.....	.....	4 86	17 09

EFFECT OF GROWING NON-LEGUMES

The object of this experiment is to use it as a check or base with which to compare the other experiments. No manure or commercial fertilizers of any kind are used. It was commenced in 1922 under a four-year rotation, including oats, barley, clover hay and timothy hay. The timothy sod is fall-ploughed for the oat crop. After harvest the land is again fall-ploughed in

preparation for barley which is the nurse-crop for the grass and clover. The results from the different crops are as follows:—

EFFECT OF GROWING NON-LEGUMES—RESULTS IN 1930

Rotation year	Crop		Yield per acre		Value of crop	
			1930	Average 6 years	1930	Average 6 years
					$	$
1	Oats (Alaska) straw	ton	0·43	0·48	.....	.....
	Oats (Alaska) grain	bush.	27·9	25·0	16 36	20 32
2	Barley straw	ton	0·32	0·38	.....	.....
	Barley grain	bush.	12·9	14·4	9 53	15 92
3	Clover hay	ton	0·35	0·89	4 90	12 61
4	Timothy hay	ton	1·04	0·92	14 56	13 08
	Average per acre		.....	.....	11 34	15 48

FERTILIZERS

FARM MANURE EXPERIMENT

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

FARM MANURE EXPERIMENT—RESULTS IN 1930

Rotation year	Crop		Yield per acre		Cost of manure	Value of crop minus cost of manure	
			1930	Average 6 years		1930	Average 6 years
					$	$	$
1	Oats (Alaska) straw	ton	0·57	0·65	.....	.....	.....
	Oats (Alaska) grain	bush.	28·5	33·1	4 80	12 64	18 68
2	Barley straw	ton	0·22	0·63	.....	.....	.....
	Barley grain	bush.	15·8	20·6	7 20	3 51	14 38
3	Clover hay	ton	1·06	1·44	4 80	10 01	14 86
4	Timothy hay	ton	2·74	1·88	7 20	31 16	21 20
	Average per acre		.....	.....	6 00	14 34	17 28

LIME EXPERIMENT

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

After the clover hay is cut, a top dressing of manure at the rate of 8 tons per acre is applied for the benefit of the timothy hay and oat crop which follow. No charge was made for the lime applied. It is possible, however, to determine its value by comparing the results obtained with those of the farm manure experiment which is similar except for the lime applied. The results from the different crops are as follows:—

LIME EXPERIMENT—RESULTS IN 1930

Rotation year	Crop		Yield per acre		Cost of manure	Value of crop minus cost of manure	
			1930	Average 6 years		1930	Average 6 years
					$	$	$
1	Oats (Alaska) straw	ton	0·67	0·84	.....	.....	.....
	Oats (Alaska) grain	bush.	34·7	33·1	4 80	16 30	19 13
2	Barley straw	ton	0·54	0·68	.....	.....	.....
	Barley grain	bush.	17·9	22·0	7 20	6 56	15 94
3	Clover hay	ton	1·14	1·24	4 80	11 16	11 95
4	Timothy hay	ton	2·64	2·00	7 20	29 76	23 11
	Average per acre		.....	.....	6 00	15 95	17 53

COMMERCIAL FERTILIZERS EXPERIMENT

The object of this experiment is to compare the effect of commercial fertilizers with farm manure; with green manure, ploughed down; with green manure and fertilizers and with no manure of any kind. This experiment was started in 1929 under a four-year rotation including oats, barley, clover hay and timothy hay. The land is fall-ploughed for oats. After the oats are harvested, it is again fall-ploughed and seeded out to grass and clover the next spring using barley as a nurse-crop. The fertilizers are applied as follows: barley, nitrate of soda 100 and superphosphate 300 pounds per acre; clover hay, nitrate of soda 100, and muriate of potash 75 pounds per acre; timothy hay, nitrate of soda 100 pounds per acre.

As this new rotation has not yet completed one full cycle no figures are available for publication.

DRAINAGE EXPERIMENT

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

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

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

The results in 1930 from timothy hay are as follows:—

DRAINAGE EXPERIMENT—RESULTS IN 1930

—		Under-drained	Not under-drained
Total cost per acre	$	14 38	14 38
Yield per acre	ton	1·91	1·99
Value of crop per acre	$	26 75	27 92
Profit per acre	$	12 37	13 54
Cost per ton	$	7 53	7 23

Over a two-year period for second year meadow the yield for the drained area is 1·92 tons per acre and 1·91 for the undrained. It should be noted however, that the area not under-drained has good surface drainage.

SURFACE DRAINAGE EXPERIMENT

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

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

This experiment is operated under a four-year rotation, including sunflowers or O.P.V., oats, clover hay and timothy hay. The results from the O.P.V. in 1930 are as follows:—

SURFACE DRAINAGE EXPERIMENT—RESULTS IN 1930

Width of lands	Yield per acre	
	1930	Average 2 years
	ton	ton
Lands 18 feet in width	3·05	4·88
Lands 24 feet in width	4·22	4·13
Lands 36 feet in width	3·30	3·94
Lands 48 feet in width	3·09	4·22

HORTICULTURE

ORCHARD

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

The most promising varieties are Osman, Columbia and Mecca. Two trees of the Columbia variety had blossoms and bore some fruits this year.

SMALL FRUITS

RED CURRANTS.—The seven varieties set out in 1920 gave in 1930 the following yields in pounds from six bushes: Red Grape, 40; Simcoe King, 30; London Red, 24; Red Dutch, 22; Victoria, 21; Long Bunch Holland, 19; and Red Cross, 19. Over a nine-year period the yields are as follows: Red Grape, 22·4; London Red, 18·3; Simcoe King, 17·8; Victoria, 15·3; Long Bunch Holland, 15·1; Red Dutch, 12·8; and Red Cross, 12·5. All these varieties gave fruits of good quality.

WHITE CURRANTS.—The two varieties set out in 1920, White Grape and White Cherry, yielded 8 pounds each from six bushes in 1930, while over a nine-year period the yields were 13·3 and 8·9 pounds respectively. Both varieties yielded fruits of good quality.

BLACK CURRANTS.—Fourteen varieties are under test since 1920. The yields in pounds from six bushes for 1930 are as follows: Buddenborg, 42; Collins Prolific, 40; Saunders, 40; Climax, 40; Topsy, 36; Magnus, 34; Ontario, 33; Kerry, 32; Victoria, 32; Beauty, 32; Eclipse, 32; Eagle, 26; Clipper, 24; and Lee Prolific, 20.

Over a nine-year period the yields in pounds were as follows: Saunders, 26·8; Climax, 25·3; Topsy, 21·7; Ontario, 21·0; Kerry, 19·8; Eagle, 19·7; Eclipse, 19·3; Buddenborg, 18·9; Collins Prolific, 17·8; Beauty, 18·3; Magnus, 17·7; Victoria, 17·6; Clipper, 13·8; and Lee Prolific, 9·7. The Saunders and Climax varieties are to be recommended for their yield and quality.

RASPBERRIES.—Eight varieties have been under test since 1920. The results in pounds per 30-foot row for 1930 are as follows: Newman No. 23, 26; Herbert, 25; Cuthbert, 20; Early June, 17; Sunbeam, 15; Brighton, 12; King, 9; and St. Regis, 9. The average yields over a nine-year period for the same varieties are as follows: Herbert, 14·6; Newman, No. 23, 11·6; Early June, 11·4; Cuthbert, 10·9; Brighton, 10·3; King, 8·4; St. Regis, 7·9; and Sunbeam, 6·9. The Herbert and Newman No. 23 varieties are to be preferred in this District for their yield and quality.

VEGETABLES

BEANS.—Nineteen varieties were planted. The results in quarts per 30-foot row from the ten highest yielding varieties are as follows: Davis White Wax, McDonald, 14·5; Improved Golden Wax, 12·6; Round Pod Kidney Wax, McDonald, 12·5; Round Pod Kidney Wax, C.E.F. 12·3; Challenge Black Wax, 12·1; Hidasta, 10·5; Yellow Eye Yellow Pod, 10·1; Bountiful, 10; Princess of Artois, 10; and Refugee or 1,000 to 1, 8·9. Davis White Wax and Round Pod Kidney Wax are the two best varieties.

BROAD BEANS.—The results in quarts per 30-foot row are as follows: Johnston Wonder, 35; Masterpiece, 29; Mazagan, 16; Long Pod Green, 15·5. The Johnston Wonder has proved one of the best varieties.

BEETS.—The results in pounds per 30-foot row are as follows: Crosby Egyptian, 28·0; Detroit Dark Red, McDonald, 26·5; Flat Egyptian, 26·5; Early Wonder, 24·0; Early Flat Egyptian, 23·0; Detroit Dark Red, O-2195, 23·0; Half Long Blood, 22·5; Detroit Dark Red, Moore, 21·5; Cardinal Globe, 17·0; Eclipse, 15·5; and Black Red Ball, 12·5. The Detroit Dark Red Variety is to be preferred for quality.

CELERY.—The results in pounds per 30-foot row are as follows: Giant Pascal, 23·5; Golden Self Blanching, 20·5; Easy Blanching, Graham, 18·0; Winter Queen, 17·0; French Success, 16·5; Easy Blanching, McDonald, 15·5; White Plume, 14·8; and Golden Yellow, new strain, 13·5. The Giant Pascal and Golden Self Blanching have proved the best varieties for this District.

CARROTS.—The results in pounds per 30-foot row are as follows: Chantenay, O-285A, 28; Oxheart, 27; Chantenay, McDonald, 26·5; Early Scarlet Horn, 26·5; Garden Gem, 24·5; Nantes, McDonald, 23; Danvers, 22; Improved Danvers, 21; Nantes, McDonald, 17. The Chantenay is to be preferred from the standpoint of quality and yield.

CUCUMBERS.—Four varieties were under test. The results in pounds per 6 hills are as follows: XXX Table, 9·0; Snow Pickling, 7·5; Long Green, 5·0; and Boston Pickling, 4·5. They are all of good quality.

ENDIVE.—Green curled gave a yield of 17 pounds per 30-foot row and is of good quality.

KOHL RABI.—White Vienna gave a yield of 27·5 pounds per 30-foot row.

LEEKS.—Musselburgh gave 22·0, while Monstrous Carentan 20·5 pounds per 30-foot row. They are both of good quality.

LETTUCE.—Fourteen varieties representing the three common types, head, cos and leaf, were under test. They all do well in this district and give a product which is quite high in quality and crispness. The yields in pounds per 30-foot row are as follows: Salamander, 57·5; Iceberg, 51·5; New York, 42·0; Earliest Wayahead, 39·0; Big Boston, 38·5; Paris White Cos, 38·5; Improved Hanson, 35·5; Black Seeded Simpson, Harris, 33·0; Early Curled Simpson, 31·5; Grand Rapids, 0-4460, 30·0; Grand Rapids, Burpee, 30·0; Early Paris Market, 27·5; White Summer Cabbage, 27·0; and Black Seeded Simpson, Ewing, 26·5.

ONIONS.—The results in pounds per 30-foot row of green onions are as follows: Southport Yellow Globe, 25·5; Yellow Globe Danvers, Steele Briggs, 25·0; Southport Red Globe, Steele Briggs, 24·5; Ailsa Craig, 17·0; Flat Red, 17·0; Giant Prizetaker, 17·0; White Barletta, 16·0; Yellow Globe Danvers, C.E.F., 16·0; Yellow Globe Danvers, Graham, 15·0; Southport, Red Globe, Graham, 14·0; Southport White Globe, 12·0; and Large Red Weathersfield, 12·0. All these varieties failed to mature. However, the Yellow Globe Danvers variety seemed to be the best adapted to this district.

PARSLEY.—Moss Curled gave a yield of 4 pounds per 30-foot row and is of good quality.

PARSNIPS.—The results in pounds per 30-foot row are as follows: Hollow Crown, McKenzie, 34; Guernsey XXX, 34; Hollow Crown, C.E.F., 25; and Eleombe Improved Hollow Crown, 24. Hollow Crown has proved the best variety.

GARDEN PEAS.—The results in quarts per 30-foot row are as follows: McLean Advancer, Ferry, 20·0; Thomas Laxton, 18·0; English Wonder, 16·5; Laxtonian, 16·0; Gradus x English Wonder, 15·0; McLean Advancer, Harris, 15·0; American Wonder, 14·0; Director, 14·0; Bruce, 14·0; Lincoln, 14·0; Kootenay, 13; and Stratagem, 12·5. The varieties which have proved the best are for: early, Thomas Laxton; medium, Laxtonian; and late, McLean Advancer.

POTATOES.—The tubers were planted on May 29 in quadruplicate one-fiftieth-acre plots. The Green Mountain variety gave a yield of 544·5 bushels of marketable and 43·6 bushels of unmarketable per acre, and the Irish Cobbler gave 471·9 bushels of marketable and 50·8 bushels of unmarketable per acre. The Irish Cobbler is to be preferred for its earliness.

PUMPKINS.—The results in pounds per 3 hills are as follows: King of the Mammoth, 19·0; Sweet or Sugar, 15·5; Connecticut Field, 15·0; Pie, 13·0; and Small Sugar, 12·0. King of the Mammoth is the best variety.

RADISH.—The results in pounds per 30-foot row are as follows: Long Scarlet Chartier, 20; Scarlet Turnip White Tip, 20; French Breakfast, Patmore, 17; XXX Scarlet Oval, 17; White Icicle, 16; French Breakfast, James, 15; French Breakfast, Brand, 15. The White Icicle is the best of all the varieties for quality.

SALSIFY.—Long White gave 14·0; Long Black, 14·0; and Sandwich Island 13·5 pounds per 30-foot row. These varieties are all good yielders of good quality roots.

SPINACH.—The results in pounds per 30-foot row are as follows: Viroflay, 32·5; Bloomsdale, 24·0; Broad Flanders, 21·0; Viroflay, P. 692, 20·0; Long Standing, 15·0; and Victoria, 15·0. The Broad Flanders is to be preferred for quality.

SQUASH.—The results in pounds per 4 hills are as follows: English Vegetable Marrow, 21·0; Kitchenette, 15·0; Delicious, 12·5; and Golden Hubbard, 9·5. English Vegetable Marrow is the best variety for yield and quality.

TURNIPS.—The results in pounds per 30-foot row are as follows: Champions (Swede), 38·0; Extra Early Purple Top Milan, 28·5; Golden Ball, 28·0; and Red Top Strap Leaf, 27·0. The Extra Early Purple Top Milan is the best table turnip.

TOMATOES.—Twenty-six varieties were planted in rows three feet apart and the plants were two feet in the row. The Alacrity is the best early variety, but the Bonny Best gives the best quality of fruits.

VARIETY TEST WITH TOMATO, RESULTS IN 1930

Variety	Source	Date first ripe fruit	Yield per 30-foot row	
			Ripe	Green
			lb.	lb.
Alacrity	C.E.F.	Sept. 1	4·5	31·5
Bonny Best	Stokes	Sept. 1	1·5	31·5
John Baer	Moore	Sept. 1	4·0	31·0
Woodward Sensation	Sharp	Sept. 1	1·0	29·5
Paris Market	Herb	Sept. 1	4·5	29·5
Chalk Early Jewel	Steele Briggs	Sept. 1	4·0	29·0
Beauty of Lorraine	Herb	Sept. 1	3·0	27·0
Avon Early	Dreer	Sept. 1	4·5	26·5
Alacrity x Bonny Best	C.E.F.	Sept. 1	2·5	26·0
Early Mascot	Graham	Sept. 1	3·5	25·5
Avon Early	Ferry	Sept. 1	5·0	25·0
Wonder of Italy	Herb	Sept. 1	4·5	25·0
Gnome	Herb	Sept. 1	3·8	24·5
Pink No. 2	C.E.F.	Sept. 1	4·0	24·5
Express	Herb	Sept. 1	3·5	24·0
Alacrity x Bonny Best	C.E.F.	Sept. 1	5·5	23·0
Marglobe	Stokes	Sept. 1	2·5	22·5
Bonny Best	Keith	Sept. 1	3·5	21·0
Herald	C.E.F.	Sept. 1	5·5	20·0
Pink No. 1	C.E.F.	Sept. 1	3·5	20·0
Alacrity x Earliboll	C.E.F.	Sept. 1	4·0	19·5
Livingston Globe x Bonny Best	C.E.F.	Sept. 1	3·5	18·0
Longportion	Kelway	Sept. 1	3·5	18·0
Earliana	Moore	Sept. 1	3·0	17·5
Bonny Best	Moore	Sept. 1	3·0	17·5
First of All	McKenzie	Sept. 1	3·5	17·0

CULTURAL EXPERIMENTS

PRUNING EXPERIMENT WITH TOMATOES.—The object of this experiment is to compare the results in yield, quality and maturity of fruit produced from various methods of pruning tomato plants to a single stem. Two varieties were sown. The seeds were sown in the greenhouse on April 11, and the plants set out in the garden on June 19, in rows 3 feet apart and the plants 1 foot in the row. The results are as follows:—

TOMATOES—RESULTS OF PRUNING EXPERIMENT

Variety	Method of pruning to single stem	First ripe fruit 19.0	Yield from 25 plants			
			1930		Three-year average	
			Ripe	Green	Ripe	Green
			lb.	lb.	lb.	lb.
Bonny Best	Not headed back	Sept. 1	9·0	90	11·1	65·3
Bonny Best	Stopped third truss of fruit	Sept. 1	12·5	85	14·5	45·3
Bonny Best	Stopped second truss of fruit	Sept. 1	15·0	80	15·8	33·7
Bonny Best	Stopped first truss of fruit	Sept. 1	10·5	70	11·8	28·1
Alacrity	Not headed back	Sept. 1	9·5	75	12·1	50·4
Alacrity	Stopped third truss of fruit	Sept. 1	13·0	60	15·1	34·3
Alacrity	Stopped second truss of fruit	Sept. 1	14·0	48	16·8	25·1
Alacrity	Stopped first truss of fruit	Sept. 1	8·8	40	15·7	17·1

NITRATE OF SODA FOR VEGETABLES.—The object of this experiment is to compare the results from vegetables which are treated with nitrate of soda versus those which received only the usual application of manure. The nitrate was applied on one-half of each row at the rate of 300 pounds per acre divided into three applications of 100 pounds each. The first application was given on July 15 and the other two at intervals of seven days. The results are as follows:—

RESULTS WITH NITRATE OF SODA FOR VEGETABLES

Vegetables	Yield per thirty-foot row			
	1930		Four-year average	
	Nitrate	No nitrate	Nitrate	No nitrate
	lb.	lb.	lb.	lb.
Beet	24·4	21·0	37·2	34·8
Cabbage	.....	.....	(a) 71·8	(a) 60·2
Carrots	25·8	22·1	56·1	49·7
Cauliflower	.....	.....	(a) 43·6	(a) 30·9
Kohl rabi	28·0	27·0	43·7	37·0
Lettuce	39·3	33·3	48·6	41·8
Parsnip	33·0	29·0	56·3	46·2
Salsify	14·3	13·0	37·1	30·9
Garden turnips	31·3	29·5	35·3	32·

(a) Three year average only.

FLOWERS

The season was particularly favourable for the production of annual flowers. The bloom was profuse and continued from July 5 until October 3 when the first killing frost occurred.

One hundred and seventy-four distinct varieties, kinds or types of annual flowers were under tests. Forty-eight were sown in the greenhouse on April 28 and they were transplanted in the open on June 11 and 12. The balance were sown in the open on May 28.

Shrubs and perennial flower bed.

Among those which were started in the greenhouse and have been found to give the best results over a number of years are the following: Antirrhinum, Aster, Balsam, Cosmos, Chrysanthemum, Dimorphotheca, Helichrysum, Marigold, Nemesia, Phlox Drummondii, Stock, Verbena and Zinnia. Among the best of those sown in the open are the following: Alyssum, Calendula, Candytuft, Clarkia, Eschscholtzia, Larkspur, Mignonette, Nasturtium, Portulaca, Poppy, Sweet Sultan, Tagetes, Virginian Stock and Sweet Peas.

Bulbs have been used quite extensively as a means of getting magnificent bloom in the very early spring. Six varieties of early single tulips, three of Cottage tulips, three of Narcissus and three Crocus were planted November 4, 1929, and they started to bloom on May 27. 1930. The majority of them have been proving very hardy, and giving good results.

PERENNIAL FLOWERS

The following sorts are proving hardy at this Station: Anemone, Aquilegia, Campanula, Chrysanthemum, Coreopsis, Delphinium, Dianthus, Papaver, Paeonia, Gaillardia, Platycodon, Rudbeckia, Spiraea, and Iris. They bloom profusely from early summer until late autumn.

Cluster of peonies.

TREES AND SHRUBS

The past year has been very favourable to the growth and development of trees and shrubs. The laurel-leaved willow and Russian Poplar continue to prove hardy. They are both very rapid growers and the former may be used either for individual trees or hedge purposes. The Caragana is also one of the hardiest tried as a deciduous hedge. The common white spruce is proving one of the most suitable sorts for an evergreen hedge.

Some of the more hardy ornamental shrubs are the Lilac, Caragana, Japanese Rose, Japanese Barberry, Golden Currant, Tartarian Honeysuckle, Viburnum lantana and Mountain Ash.

CEREALS

SPRING WHEAT

Five varieties were under test. The seed was sown on May 22, in quadruplicate one-fortieth-acre plots, at the rate of 2 bushels per acre. The results are as follows:—

RESULTS OF 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 10 points	Actual yield of grain per acre		Five-year average		
							Number of days maturing	Yield of grain per acre	
			in.		bush.	lb.		bush.	lb.
Huron, Ott. 3	Sept. 13	114	47	10	22	20	124	27	44
Garnet, Ott. 652	" 5	106	40	10	18	20	112	24	34
Ruby, Ott. 623	" 9	110	41	10	16	40	113	22	48
Reward, Ott. 928	" 10	111	40	10	15	10	.....	..	..
Marquis, Ott. 15	" 13	114	45	10	14	50	123	25	52

All the varieties were considerably affected by rust and this reduced the yields very materially. The Garnet, Ruby, and Reward varieties are decidedly earlier than the Huron and Marquis. This is a very strong point in their favour for northern districts where the growing season is shorter and the harvest weather not always favourable.

OATS

Seven varieties were under test. The seed was sown on May 23 and 27, in quadruplicate one-fortieth-acre plots, at the rate of $2\frac{1}{2}$ bushels per acre. The results are as follows:—

RESULTS OF VARIETY TEST WITH OATS

Variety	Date of ripening	Number of days maturing	Average length of straw including head	Strength of straw on scale of 10 points	Actual yield of grain per acre		Seven-year average		
							Number of days maturing	Yield of grain per acre	
			in.		bush.	lb.		bush.	lb.
Victory	Sept. 16	112	49	10	57	22	124	57	2
O.A.C. No. 72	" 16	112	46	10	56	26	126	55	11
Banner, Ott. 49	" 16	112	42	10	50	20	125	51	25
Laurel, Ott. 477	" 6	102	39	10	46	16	115	43	15
Alaska	Aug. 30	99	40	10	45	0	111	50	13
Gold Rain	Sept. 16	112	48	10	43	28	122	53	11
Liberty	" 5	101	43	10	41	6	114	38	27

It should be noted that the Alaska variety is the earliest of those grown over a seven-year period. The Victory, O.A.C. No. 72, Banner, and Gold Rain varieties have been more or less affected by frost each year before maturing on account of their slow growing. Liberty and Laurel are both hulless varieties.

BARLEY

Seven varieties were under test. The seed was sown on May 27, in quadruplicate one-fortieth-acre plots, at the rate of 2 bushels per acre. The results are as follows:—

RESULTS OF VARIETY TEST WITH BARLEY

Variety	Date of ripening	Number of days maturing	Average length of straw including head	Strength of straw on scale of 10 points	Actual yield of grain per acre		Five-year average	
							Number of days maturing	Yield of grain per acre
			in.		bush.	lb.		bush. lb.
Charlottetown 80	Sept. 16	112	39	10	52	24	120	40 42
Duckbill, Ott. 57	" 16	112	43	10	45	10	119	41 20
Gold	" 6	102	34	10	44	38	116	53 4
Manchurian, Ott. 50	" 6	102	43	10	40	10	111	39 42
Himalayan, Ott. 59	Aug. 30	95	35	9	35	20	101	39 36
O.A.C. No. 21	Sept. 2	98	45	9	34	18	108	41 6
Mensury, Ott. 60	" 2	98	48	9	32	4	110	40 46

Gold, Charlottetown 80, and Duckbill Ottawa 57 are all two-rowed varieties, while O.A.C. No. 21, Mensury Ottawa 60, and Manchurian Ottawa 50 are all standard six-rowed varieties.

FIELD PEAS

Five varieties were under test. The seed was sown on May 23, in quadruplicate one-fortieth-acre plots. The average rate of seeding was 3 bushels per acre. The results are as follows:—

RESULTS OF VARIETY TEST WITH FIELD PEAS

Variety	Date of harvesting	Average length of plant	Actual yield of grain per acre		Five-year average	
					Number of days maturing	Yield of grain per acre
		in.	bush.	lb.		bush. lb.
Arthur, Ott. 18	Sept. 25	50	40	0	123	43 32
Early Raymond	" 25	75	32	50	119	31 4
Mackay, Ott. 25	" 25	64	27	50	131	36 38
Golden Vine	" 25	70	25	30	121	35 20
Chancellor	" 25	61	25	0	117	37 36

It will be noted from the above table that all the varieties were harvested on the same date. The fact is that none of the varieties were fully matured. However, from observations at the time of harvesting the Chancellor and Early Raymond had a greater percentage of mature peas.

Chancellor variety has proved one of the earliest varieties and one of the best yielders over a five-year period.

SPRING RYE

Only one variety, namely, Common spring rye, was under test. The seed was sown on May 28, in quadruplicate one-fortieth-acre plots, at the rate of 1½ bushels per acre. It matured in 121 days and gave a yield of 29 bushels and 6 pounds per acre. Over a nine-year period the average yield is 28 bushels and 7 pounds and the number of days to mature 121.

BUCKWHEAT

Three varieties were under test. The seed was sown on June 12, in quadruplicate one-fortieth-acre plots at the rate of 1½ bushels per acre. The results are as follows:—

RESULTS OF VARIETY TEST WITH BUCKWHEAT

Variety	Date of ripening	Number of days maturing	Average length of straw including head	Actual yield of grain per acre	Two-year average	
					Number of days maturing	Yield of grain per acre
			in.	bush. lb.		bush. lb.
Black	Sept. 16	96	26	23 10	94	22 0
Silverhull	" 16	96	27	17 30	94	20 40
Rye	" 16	96	14	9 30	94	14 0

FALL WHEAT

Seven varieties or strains were under test. The seed was sown on August 23, 1929, in quadruplicate one-fortieth-acre plots at the rate of 2 bushels per acre. The results are as follows:—

RESULTS OF VARIETY TEST WITH FALL WHEAT

Variety	Strength of straw on scale of ten points	Average length of plant	Actual yield of grain per acre
		in.	bush. lb.
Minhardi	10	36	6 50
Kharkov, M.C. 22	10	37	6 40
Kharkov, Nobleford	10	36	6 20
Kharkov, Lethbridge	10	34	6 10
Kanred	10	33	6 10
O.A.C. No. 104	10	36	4 50
Dawson's Golden Chaff	10	34	3 50

It may be noted that the above yields are light, and this may be explained by the fact that the absence of snow in the late fall of 1929 and its early disappearance in the spring of 1930, the season was particularly hard on fall grain. The plots were actually less than 50 per cent stand.

FALL RYE

Two varieties were under test. The seed was sown on August 30, 1929, in quadruplicate one-fortieth-acre plots, at the rate of 1½ bushels per acre. The results are as follows:—

RESULTS OF VARIETY TEST WITH FALL RYE

Variety	Date of ripening	Strength of straw on scale of ten points	Average length of plant	Actual yield of grain per acre	Six-year average
					Yield of grain per acre
	1930		in.	bush. lb.	bush. lb.
Dakold	Aug. 27	8	49	37 18	30 55
Common	" 27	8	50	28 2	28 12

ROD-ROW PLOTS

In 1930, sixteen varieties or strains of spring wheat, twenty-four of oats, twenty-four of barley, three of buckwheat, and twelve of peas and vetch were under test in these preliminary trials. Besides there were nineteen varieties of spring wheat, fourteen of oats, and fifteen of barley under observation. The seed germinated well and a very good stand developed.

FORAGE CROPS

ENSILAGE CROPS

VARIETY TESTS WITH SUNFLOWERS

Five varieties of sunflowers were under test. The seeds were sown on June 2, in quadruplicate one-fortieth-acre plots, on fall-ploughed sod which was manured at the rate of 16 tons per acre previous to ploughing. The rows were 30 inches apart, and the plants were thinned to from 6 to 12 inches apart in the row. The germination was good and a good stand developed. They were harvested on September 12. The results are as follows:—

RESULTS OF VARIETY TEST WITH SUNFLOWERS

Variety	Source of seed	Average height, 1930	Per cent in bloom, when cut, 1930	Yield per acre			
				1930		Average 1924–30	
				Green weight	Dry weight	Green weight	Dry weight
		in.		ton lb.	ton lb.	ton lb.	ton lb.
Mammoth Russian	McDonald	64	0	12 1,490	1 1,531	14 836	1 1,725
Early Ottawa 76	C.E.F.	61	55	10 50	1 1,166	11 1,008	1 1,213
Mennonite	Rosthern	48	100	8 1,820	1 863	.....	.....
Manchurian	McKenzie	65	40	7 940	1 385	10 1,392	1 1,162
Mammoth Russian	Dakota Improved Seed Co.	60	25	5 820	0 1,667	13 1,156	1 1,561

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

Harvesting sunflowers for silage.

VARIETY TEST OF CORN

Twenty-eight varieties and strains of corn were under test. The seed was planted on June 2, in quadruplicate one-eightieth-acre plots on fall-ploughed clay land which had been manured at the rate of 16 tons per acre for the previous crop. The corn was planted in hills 30 inches apart each way with 4 to 6 kernels to the hill. The seed germinated well, but the yield was very low. The plots were harvested on September 8. The average yield per acre of green material for the 28 varieties was 3 tons 990 pounds and 986 pounds of dry material.

FIELD ROOTS

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

MANGELS

Thirty-five varieties were under test. The seed was sown on May 30, and the plants were thinned to 8 inches apart in the row. However, there were practically no plots on which a full stand was obtained. In fact some of the plots were less than a 50 per cent stand. The plots were harvested on October 4. The results are as follows:—

RESULTS OF VARIETY TEST WITH MANGELS

Variety	Source of seed	Yield per acre			
		1930		Average 1925-30	
		Green weight	Dry weight	Green weight	Dry weight
		ton lb.	lb.	ton lb.	ton lb.
Prize Mammoth Long Red	Steele Briggs	7 1,260	1,883	.....	.....
Giant Yellow Intermediate	Steele Briggs	7 980	1,772	8 160	1 59
Royal Giant	Steele Briggs	7 520	1,726	.....	.....
Giant White Feeding Sugar	Steele Briggs	7 60	1,910	8 1,950	1 281
Danish Sludstrup	D. & F.	6 860	1,503	7 1,083	0 1,789
Red Eckendorfer	G. Swedish	6 0	1,466	7 1,540	0 1,845
New Ideal	Steele Briggs	5 1,620	1,405	8 487	0 1,996
Red Eckendorfer	Hartmann	5 1,440	1,362	8 393	0 1,864
Giant White	Bruce	5 1,340	924	8 1,440	1 101
Stryno Barres	Hartmann	5 1,260	1,370	8 1,823	1 216
Barres Oval	G. Swedish	5 1,040	1,434	8 943	1 139
Yellow Leviathan	Steele Briggs	5 1,020	1,404	8 757	1 155
Taaroje Barres	Hartmann	5 940	1,299	.....	.....
Eclipse	McKenzie	5 940	1,335	.....	.....
Yellow Intermediate	C.E.F.	5 780	1,490	.....	.....
Giant Yellow Globe	Steele Briggs	5 780	1,216	7 1,367	0 1,780
Red Globe	Ewing	5 560	1,258	6 1,200	0 1,713
Fjerritslev Barres	Hartmann	4 1,780	1,172	8 347	0 1,994
White Red Top Half Sugar	Hartmann	4 1,760	1,335	7 897	0 1,982
Gate Post	Bruce	4 1,640	1,347	.....	.....
Giant Red Sugar	Bruce	4 1,120	1,200	.....	.....
Yellow Eckendorfer	G. Swedish	4 1,100	1,131	8 357	0 1,863
Barres Half Long	G. Swedish	4 1,000	891	7 860	0 1,936
Giant Rose	Bruce	4 460	993	.....	.....
Yellow Leviathan	Bruce	4 200	1,162	7 1,110	0 1,897
Svalop Original Rubra	G. Swedish	4 180	1,162	.....	.....
Yellow Globe	Bruce	4 40	825	.....	.....
Red Globe	Bruce	3 1,900	1,087	6 1,040	0 1,651
Rosted Barres	Hartmann	3 1,700	943	.....	.....
Elvethan Mammoth	Hartmann	3 1,040	918	7 767	1 83
Golden Tankard	Bruce	3 440	851	6 960	0 1,716
Eckendorfer Yellow	Hartmann	2 1,960	709	8 103	0 1,872
Danish Sludstrup	McDonald	2 1,520	617	6 1,370	0 1,675
Sludstrup Barres	Hartmann	2 1,380	676	.....	.....
White Green Top Half Sugar	Hartmann	2 1,060	622	7 860	0 1,949

DATE OF SEEDING MANGELS

The object of this experiment is to compare the results from different dates of seeding. The variety used was Yellow Intermediate. The seed was sown

at intervals of seven days commencing on May 28. The roots were harvested on October 6. The results are as follows:—

DIFFERENT DATES OF SEEDING MANGELS

Date of seeding 1930	Yield per acre							
	1930				Average 1927–30			
	Green weight		Dry weight		Green weight		Dry weight	
	ton	lb.	ton	lb.	ton	lb.	ton	lb.
May 28	5	70	1	485	9	833	1	387
June 4	4	280	1	223	7	1,610	1	128
June 11	5	1,280	1	642	6	1,120	0	1,671
June 18	3	1,700	1	141	4	1,865	0	1,332
June 25	3	1,140	1	074	3	975	0	915
July 2	3	40		867	1	1,915	0	519

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

SWEDE TURNIPS

Thirty-four varieties were under test. The seed was sown on May 27, and the plants were thinned to 12 inches apart in the row, although there were very few of the plots on which there was a full stand. The plots were harvested on September 30. The results are as follows:—

RESULTS OF VARIETY TEST WITH SWEDE TURNIPS

Variety	Source of seed	Yield per acre							
		1930				Average 1925-30			
		Green weight		Dry weight		Green weight		Dry weight	
		ton	lb.	ton	lb.	ton	lb.	ton	lb.
Elephant or Monarch	Ewing	12	1,080	1	45				
Jumbo	Steele Briggs	10	1,560	0	1,764	11	423	1	43
Perfection	Dupuy & Ferguson	10	1,340	1	8				
Mustrala	Hartmann	10	1,180	1	103				
Hazards Improved Bronze Top	Steele Briggs	10	480	0	1,977	9	1,686	0	1,981
Canadian Gem	Steele Briggs	10	480	0	1,832				
Kangaroo	Steele Briggs	10	380	0	1,805	10	989	0	1,991
Hall's Westbury	Bruce	9	1,800	0	1,759				
Olsgaard Bangholm	Hartmann	9	1,420	1	175				
Kangaroo	Bruce	9	1,420	0	1,693	10	514	0	1,857
Magnum Bonum	Bruce	9	1,260	0	1,765	10	1,423	1	46
Selected Purple Top	Steele Briggs	9	400	0	1,228	12	483	1	236
Good Luck	Steele Briggs	8	1,480	0	1,693	9	1,840	0	1,869
Bangholm Klank	Hartmann	8	1,180	0	1,863				
Hazelwood's Bronze Top	Steele Briggs	8	1,120	0	1,837				
Yellow Swedish	G. Swedish	8	620	0	1,759	12	1,974	1	482
Ditmars	McNutt	8	600	0	1,676	11	1,697	1	46
Hartley's Bronze Top	Bruce	7	1,860	0	1,791	9	303	0	1,962
Bangholm	G. Swedish	7	1,780	0	1,552	11	1,903	1	331
Corning's Green Top	Yarmouth	7	1,760	0	1,522				
Bangholm	Ewing	7	1,720	0	1,474	10	726	0	1,998
Hartley's Bronze Top	Graham	7	360	0	1,342				
Derby Green Top	Bruce	7	200	0	1,282	9	1,694	0	1,882
Bangholm	Kentville	7	40	0	1,750				
Bangholm	Nappan	6	1,280	0	1,578				
White Butter	Hartmann	6	1,220	0	1,428				
New Perfect	Bruce	6	580	0	1,247	10	486	0	1,897
Bangholm Sludsgaard	Trifolium	5	1,780	0	1,685				
White Swede	Bruce	5	1,680	0	1,298	10	929	1	65
Canadian Gem	Bruce	5	1,320	0	1,133	10	140	0	1,893
Bangholm	Charlottetown	5	1,280	0	1,506				
Bangholm Klank	Trifolium	5	1,200	0	1,317				
Shepherd's Golden Globe	Hartmann	5	800	0	1,156				
Elephant or Monarch	Bruce	4	400	0	840				

DATE OF SEEDING SWEDE TURNIPS

The object of this experiment is to compare the results from different dates of seeding. Bangholm was the variety used. The seed was sown at intervals of seven days commencing on May 28. The roots were harvested on September 30. The results are as follows:—

RESULTS FROM DIFFERENT DATES OF SEEDING SWEDE TURNIPS

Date of seeding 1930	Yield per acre							
	1930				Average 1927-30			
	Green weight		Dry weight		Green weight		Dry weight	
	ton	lb.	ton	lb.	ton	lb.	ton	lb.
May 28	10	1,500	0	1,949	11	155	1	341
June 4	12	220	1	177	10	320	1	141
June 11	8	1,740	0	1,722	7	690	0	1,630
June 18	8	560	0	1,425	5	1,020	0	1,201
June 25	5	400	0	860	3	1,075	0	759
July 2	4	340	0	777	2	390	0	468

It may be noted that the second date of seeding has given the largest yield, but over a four-year period the first date has proved the best for both the green and dry material.

FALL TURNIPS

Fourteen varieties were under test. The seed was sown on June 7, and the plants were thinned to 12 inches apart in the row. The plots were harvested from September 26 to 29. The results are as follows:—

RESULTS OF VARIETY TEST WITH FALL TURNIPS

Variety	Source of seed	Yield per acre							
		1930				Average 1924-30			
		Green weight		Dry weight		Green weight		Dry weight	
		ton	lb.	ton	lb.	ton	lb.	ton	lb.
Fynsk Bortfelder	D.L.F.	17	480	1	179	.....		.....	
Purple Top Mammoth	Steele-Briggs	16	1,680	1	45	17	837	1	210
Pomeranian White Globe	Steele Briggs	15	440	0	1,977	16	841	1	272
Early Six Weeks	Sutton	15	440	0	1,875	17	719	1	53
Devonshire Graystone	Steele Briggs	15	80	0	1,972	17	1,903	1	251
Purple Top Aberdeen	Sutton	14	1,720	1	82	.....		.....	
Hardy Green Round	Sutton	13	1,880	0	1,730	16	359	1	165
Purple Top Mammoth	Sutton	13	1,840	0	1,659	17	1,400	1	199
Yellow Tankard	D.L.F.	13	1,360	0	1,659	.....		.....	
White Globe	Ewing	12	1,060	0	1,514	16	886		86
Aberdeen Purple Top	Steele Briggs	12	860	0	1,651	15	214	1	201
Red Paragon	Sutton	12	280	0	980	16	1,260	1	59
Dales	D.L.F.	9	1,540	0	1,158	.....		.....	
Green Top Yellow Aberdeen	Ewing	9	380	0	1,464	13	583	1	60

DATE OF SEEDING FALL TURNIPS

The object of this experiment is to ascertain what date or dates of seeding give the largest yields and are the most satisfactory generally. Hardy

Green Round was the variety used. The seed was sown at intervals of seven days, commencing on May 28. The roots were harvested on September 29. The results are as follows:—

RESULTS FROM DIFFERENT DATES OF SEEDING FALL TURNIPS

Date of seeding, 1930	Yield per acre							
	1930				Average 1924-30			
	Green weight		Dry weight		Green weight		Dry weight	
	ton	lb.	ton	lb.	ton	lb.	ton	lb
May 28	18	940	1	1,395	20	1,706	1	900
June 4	14	1,340	1	39	17	929	1	445
June 11	8	1,680	0	1,024	13	1,700	0	1,989
June 18	7	940	0	1,031	10	940	0	1,515
June 25	7	660	0	904	9	149	0	1,270
July 2	3	680	0	509	5	934	0	801

It may be noted from the above that although fall turnips are rapid growers and are better adapted to late seeding than swedes, nevertheless, they will give the best yields where sown early.

FIELD CARROTS

Sixteen varieties were under test. The seed was sown on June 7, and the plants were thinned to about 4 inches apart in the rows. They were harvested on October 9. The results are as follows:—

RESULTS OF VARIETY TEST WITH FIELD CARROTS

Variety	Source of seed	Yield per acre							
		1930				Average 1924-30			
		Green weight		Dry weight		Green weight		Dry weight	
		ton	lb.	ton	lb.	ton	lb.	ton	lb.
Improved Short White	Steele Briggs	8	140	0	1,507	6	57	0	1,125
Danish Champion	C.E.F.	7	380	0	1,630	4	931	0	987
Long Orange	Bruce	6	1,620	0	1,530	3	1,240	0	861
White Belgian	Hartmann	6	1,220	0	1,339	4	1,940	0	1,052
James	D.L.F.	6	1,140	0	1,564	.....		.....	
Champion	G. Swedish	6	600	0	1,347	.....		.....	
Champion	Hartmann	6	360	0	1,341	4	143	0	887
White Intermediate	Summerland	5	1,440	0	1,085	.....		.....	
Long White Vosges	Bruce	5	1,100	0	1,163	.....		.....	
Mammoth Intermediate White	Bruce	5	900	0	996	5	383	0	1,026
Long Red Surrey	Steele Briggs	4	1,940	0	1,174	.....		.....	
Long Orange Belgian	Bruce	4	1,780	0	1,091	3	1,417	0	870
White Belgian	Bruce	4	1,540	0	984	4	1,331	0	971
Large White Belgian	Steele Briggs	4	300	0	884	4	797	0	938
White Belgian	D. & F.	2	1,560	0	626	4	77	0	876
White Belgian	Trifolium	1	1,420	0	360	.....		.....	

DATE OF SEEDING FIELD CARROTS

The object of this experiment is to ascertain what date or dates of seeding will give the best results. Improved Short White was the variety used. The seed was sown at intervals of seven days commencing on May 28. The roots were harvested on October 6. The results are as follows.

RESULTS FROM DIFFERENT DATES OF SEEDING FIELD CARROTS

Date of seeding	Yield per acre							
	1930				Average 1927-1930			
	Green weight		Dry weight		Green weight		Dry weight	
	ton	lb.	ton	lb.	ton	lb.	ton	lb.
May 28	4	360	0	826	7	1,220	0	1,405
June 4	3	1,000	0	675	7	375	0	1,279
June 11	2	460	0	423	5	675	0	998
June 18	1	1,820	0	384	3	1,220	0	669
June 25	0	1,380	0	138	1	985	0	285
July 2	0	580	0	61	0	995	0	95

This table shows quite vividly the importance of sowing field carrots as early as possible.

LEGUMES AND GRASSES

HAY PRODUCTION FROM GRASSES, ALONE AND IN COMBINATION WITH CLOVERS

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

In 1928 this experiment was seeded on May 25 in quadruplicate one-fortieth-acre plots, using Alaska oats as a nurse crop. In 1929 it was again seeded on June 13 in a similar manner. The results in 1930 from these two seedings and also the average results from the 1923-28 seedings are shown in the following table:—

HAY PRODUCTION FROM GRASSES ALONE AND IN COMBINATION WITH CLOVER

Seed sown per acre					Yield per acre											
					Second-year meadow 1930				First-year meadow, 1930				Average first and second-year meadow 1924-30			
					Dry weight		Cured hay containing 15 per cent moisture		Dry weight		Cured hay containing 15 per cent moisture		Dry weight		Cured hay containing 15 per cent moisture	
Red clover	Alsike clover	Timothy	Meadow fescue	Orchard grass	ton	lb.	ton	lb.	ton	lb.	ton	lb.	ton	lb.	ton	lb.
lb.	lb.	lb.	lb.	lb.												
10		8			1	1,114	1	1,664	2	413	2	1,192	1	1,462	2	73
10			15		1	597	1	1,055	2	22	2	732	1	1,133	1	1,686
10				15	1	117	1	491	1	1,693	2	345	1	605	1	1,065
10		6	10		1	344	1	758	2	306	2	1,066	1	1,157	1	1,714
10		6		10	1	377	1	796	2	89	2	811	1	1,033	1	1,568
10			10	10	1	181	1	566	1	1,880	2	565	1	705	1	1,182
	6	8			1	1,124	1	1,675	2	518	2	1,315	1	1,470	2	82
	6		15		1	751	1	1,236	2	40	2	753	1	913	1	1,427
	6			15	1	572	1	1,026	1	1,619	2	258	1	768	1	1,256
	6	6	10		1	985	1	1,512	2	1,306	3	242	1	1,235	1	1,806
	6	6		10	1	1,200	1	1,765	2	24	2	734	1	996	1	1,525
	6		10	10	1	593	1	1,051	1	1,895	2	582	1	793	1	1,286
8	2	8			1	991	1	1,519	2	674	2	1,499	1	1,219	1	1,787
8	2		15		1	567	1	1,020	2	251	2	1,001	1	952	1	1,473
8	2			15	1	658	1	1,127	1	1,460	2	71	1	723	1	1,204
8	2	6	10		1	905	1	1,418	1	1,897	2	585	1	1,184	1	1,746
8	2	6		10	1	664	1	1,134	2	425	2	1,205	1	1,197	1	1,761
8	2		10	10	1	551	1	1,001	2	235	2	982	1	1,062	1	1,602
		12			1	1,009	1	1,540	1	678	1	1,151	1	957	1	1,479
			30		1	509	1	952	1	1,341	1	1,578	1	331	1	742
				30	1	118	1	492	1	1,212	1	1,779	0	1,742	1	49
		8	15		1	508	1	951	1	1,039	1	1,575	1	331	1	742
		8		15	1	372	1	791	1	519	1	964	1	288	1	692
			15	15	1	219	1	611	1	633	1	1,098	1	198	1	586

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

AVERAGE OF THE DIFFERENT MIXTURES

Plots averaged	Average yield per acre from first- and second-year meadow, 1924–30	
	Dry weight	Cured hay containing 15 per cent moisture
	ton lb.	ton lb.
Where red clover s the base (6 plots)	1 1,016	1 1,548
Where alsike clover is the base (6 plots)	1 1,029	1 1,564
Where red and alsike mixed are the base (6 plots)	1 1,056	1 1,595
Where no clover is used (6 plots)	1 303	1 715
Where timothy is included (4 plots)	1 1,277	1 1,855
Where meadow fescue is included (4 plots)	1 832	1 1,332
Where orchard grass is included (4 plots)	1 460	1 894
Where timothy and meadow fescue are included (4 plots)	1 977	1 1,502
Where timothy and orchard grass are included (4 plots)	1 879	1 1,387
Where meadow fescue and orchard grass are included (4 plots)	1 690	1 1,165

It will be seen from the above table that over a six-year average the mixtures containing red and alsike clover have given the largest yields, followed closely by those containing alsike clover alone and red clover alone.

Comparing the three different grasses, it is found that the timothy is superior to either meadow fescue or orchard grass, particularly the latter, both when grown alone and in the mixture. However, it is interesting to note that reasonably good yields may be obtained from any of the various mixtures under test.

TIMOTHY AND CLOVERS FOR HAY PRODUCTION

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

In 1928 this experiment was seeded on May 29, in quadruplicate one-fortieth-acre plots, using Alaska oats as a nurse-crop. In 1929 it was seeded on June 13 in a similar manner. The results in 1930 from these two seedings, and also the average results from 1923-28 seedings are shown in the following table:—

RESULTS FROM TESTS OF TIMOTHY AND CLOVERS FOR HAY PRODUCTION

Seed sown per acre			Yield per acre							
			Second-year meadow, 1930		First-year meadow, 1930		Average first- and second-year meadow, 1924–30	
Timothy	Red clover	Alsike clover	Dry weight	Cured hay containing 15 per cent moisture	Dry weight	Cured hay containing 15 per cent moisture	Dry weight	Cured hay containing 15 per cent moisture
lb.	lb.	lb.	ton lb.	ton lb.	ton lb.	ton lb.	ton lb.	ton lb.
8	10	.....	1 474	1 911	2 1,285	3 218	1 1,269	1 1,846
8	8	2	1 567	1 1,020	2 1,207	3 126	1 1,389	1 1,987
8	6	3	1 822	1 1,320	2 1,413	3 368	1 1,438	2 45
8	4	4	1 1,081	1 1,625	2 1,410	3 365	1 1,345	1 1,935
8	2	5	1 839	1 1,340	2 1,447	3 408	1 1,280	1 1,859
6	10	.....	1 842	1 1,344	2 856	2 1,713	1 1,269	1 1,846
6	8	2	1 605	1 1,075	2 1,035	2 1,924	1 1,372	1 1,967
6	6	3	1 413	1 839	2 1,004	2 1,887	1 1,235	1 1,806
6	4	4	1 268	1 668	2 1,068	2 1,962	1 1,185	1 1,747
6	2	5	1 451	1 884	2 902	2 1,767	1 1,224	1 1,793

The figures in this table would seem to indicate that timothy, red clover, and alsike clover may be each or all varied considerably in a hay mixture without materially affecting the yield obtained. According to these figures, however, 2 to 4 pounds of red clover may be profitably replaced by alsike.

LATE AND EARLY CLOVER WITH LATE AND EARLY GRASS

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

This experiment was seeded in 1927 in quadruplicate one-fortieth-acre plots, using Alaska oats as a nurse-crop. In 1929 it was repeated in a similar manner. The results to date are as follows:—

RESULTS FROM LATE AND EARLY CLOVER WITH LATE AND EARLY GRASS

Seed sown per acre				Yield per acre									
				Second-year meadow, 1930				First-year meadow, 1930				Average first- and second-year meadow, 1924–30			
Timothy	Meadow fescue	Early red clover	Late red clover	Dry weight		Cured hay containing 15 per cent moisture		Dry weight		Cured hay containing 15 per cent moisture		Dry weight		Cured hay containing 15 per cent moisture	
lb.	lb.	lb.	lb.	ton	lb.	ton	lb.	ton	lb.	ton	lb.	ton	lb.	ton	lb.
8	.....	10	.....	1	1,039	1	1,575	2	359	2	1,128	1	1,246	1	1,819
.....	15	10	.....	1	784	1	1,275	2	147	2	879	1	984	1	1,511
8	.....	.....	10	1	1,065	1	1,606	2	231	2	978	1	1,411	2	13
.....	15	.....	10	1	805	1	1,300	1	980	2	682	1	1,074	1	1,616

Over a six-year period it is found that timothy has been giving somewhat better results than the meadow fescue and the late red is outyielding the early red.

VARIETY TEST WITH RED CLOVER

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

The results in 1930 are from sixteen varieties which were seeded on June 15, 1929, in quadruplicate one-fortieth-acre plots, using Alaska oats as a nurse-crop. The results are as follows:—

RESULTS OF VARIETY TEST WITH RED CLOVER—FIRST YEAR MEADOW

Variety	Yield per acre			
	1930		Five-year average, 1926-30	
	Dry weight	Cured hay containing 15 per cent moisture	Dry weight	Cured hay containing 15 per cent moisture
	ton lb.	ton lb.	ton lb.	ton lb.
Oxdrift	2 1,027	2 1,914	1 1,843	2 521
Ufa 1	2 727	2 1,561	.....	.....
Late Swedish	2 713	2 1,545	.....	.....
Biisk	2 607	2 1,420	.....	.....
Ste. Rosalie	2 428	2 1,209	.....	.....
Perm 2	2 369	2 1,140	.....	.....
Altaswede	2 188	2 927	1 1,686	2 336
Trefle Violet du Nord	1 1,948	2 645	.....	.....
Early Swedish	1 1,737	2 396	1 1,349	1 1,940
Kiev 4 (one cut)	1 1,603	2 239	.....	.....
Trefle Violet du Sud	1 1,601	2 236	.....	.....
Trefle Violet de l'Ouest	1 1,463	2 74	.....	.....
Welsh Red	1 1,217	1 1,785	.....	.....
Kapuskasing	1 1,157	1 1,714	1 1,048	1 1,586
Chateauguay	1 1,099	1 1,646	1 1,075	1 1,618
Wild Red	1 770	1 1,259	.....	.....

NITRO CULTURE ON RED CLOVER

The object of this experiment is to compare the results from red clover when seeded with and without nitro-culture treatment. In 1928 this experiment was seeded on May 31, in quadruplicate one-fortieth-acre plots, with Alaska oats as a nurse-crop. In 1929 it was again seeded on June 14 in a similar manner. The results from these two seedings, and also the average results from 1923-28 seedings, are given in the following table:—

RESULTS FROM NITRO-CULTURE ON RED CLOVER

Treatment	Yield per acre									
	Second-year meadow, 1930		First-year meadow, 1930		Average, first and second-year meadow, 1924-30					
	Dry weight	Cured hay containing 15 per cent moisture	Dry weight	Cured hay containing 15 per cent moisture	Dry weight	Cured hay containing 15 per cent moisture				
	ton lb.	ton lb.	ton lb.	ton lb.	ton lb.	ton lb.				
Treated	1 293	1 697	2 337	2 1,102	1 665	1 1,135				
Untreated	1 216	1 607	2 754	2 1,593	1 738	1 1,221				

There is no advantage in treating red clover with nitro-culture, as it appears as though the soil is sufficiently well inoculated with the proper bacteria for this plant.

VARIETY TEST WITH ALFALFA

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

In 1928 seven varieties were seeded on May 30, in quadruplicate one-fortieth-acre plots, using Alaska oats as a nurse-crop. In 1929 the experiment was repeated in a similar manner with eight varieties. The results in 1930 for the two cuttings are as follows:—

RESULTS OF VARIETY TEST WITH ALFALFA

Variety	Yield per acre									
	Second-year meadow, 1930				First-year meadow, 1930				Average, first and second-year meadow, 1927-30			
	Dry weight		Cured hay containing 15 per cent moisture		Dry weight		Cured hay containing 15 per cent moisture		Dry weight		Cured hay containing 15 per cent moisture	
	ton	lb.	ton	lb.	ton	lb.	ton	lb.	ton	lb.	ton	lb.
Falcata, Par Alfalfa Farm..	2	538	2	1,339	1	1,627	2	267	1	492	1	932
Baltic, D.I.S. Co.....	2	377	2	1,149	2	217	2	961	1	1,708	2	362
Cossack, Par. Alfalfa Farm.	2	180	2	918	2	1,188	3	104	1	1,446	2	54
Grimm, Alta. Seed Growers.....	2	146	2	878	2	465	2	1,253	1	1,510	2	129
Variegated, Peel Co.....	1	1,868	2	551	2	690	2	1,518	1	1,278	1	1,856
Cossack, D.I.S. Co.....	1	1,848	2	527	2	570	2	1,376	1	1,362	1	1,955
Grimm, A. B. Lyman.....	1	1,773	2	439	2	229	2	975	1	1,247	1	1,820
Grimm, Kapuskasing grown.....	.....		.....		2	1,690	3	694	.....		.....	

METHODS OF SEEDING ALFALFA FOR HAY PRODUCTION

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

In 1928 this experiment was seeded on June 1, in quadruplicate one-fortieth-acre plots, using Alaska as a nurse-crop. In 1929 it was seeded on June 19 in a similar manner. The results in 1930 from these two seedings and also the average results from 1923-28 seedings are shown in the following table:—

RESULTS FROM DIFFERENT METHODS OF SEEDING ALFALFA FOR HAY PRODUCTION

Method	Yield per acre									
	Second-year meadow, 1930				First-year meadow, 1930				Average, first and second-year meadow, 1924-30			
	Dry weight		Cured hay containing 15 per cent moisture		Dry weight		Cured hay containing 15 per cent moisture		Dry weight		Cured hay containing 15 per cent moisture	
	ton	lb.	ton	lb.	ton	lb.	ton	lb.	ton	lb.	ton	lb.
With a nurse-crop—												
In drills 12 inches apart...	2	1,498	3	468	2	1,106	3	7	2	89	2	811
Broadcast 20 pounds per acre.....	2	1,045	2	1,935	2	1,253	3	180	2	144	2	875
Without a nurse-crop—												
In drills 12 inches apart...	2	1,804	3	828	2	1,021	2	1,907	2	657	2	1,479
Broadcast 20 pounds per acre.....	2	1,275	3	206	2	1,660	3	659	2	894	2	1,758

From these figures it will be seen that the broadcast seeding at the rate of 20 pounds per acre has given a larger yield than when sown in rows 12 inches apart. There is also less danger of weeds becoming established with broadcast seeding and the hay is a little better in quality, as it appears to be a little finer in the stem.

There is quite a difference between the plots seeded with and without a nurse-crop, in favour of the latter method. Considering the average results, however, it is rather doubtful if the increase in yield is sufficient to justify the adoption of this method on a large scale, as it means the loss of one season's crop, and there is a greater tendency for the weeds to become established where no nurse-crop is present.

NITRO-CULTURE ON ALFALFA

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

In 1928 this experiment was seeded on May 30, in quadruplicate one-fortieth-acre plots at the rate of 20 pounds per acre with a nurse-crop. In 1929 it was seeded on June 19 in a similar manner. The results to date are as follows:—

RESULTS FROM NITRO-CULTURE ON ALFALFA

Treatment	Yield per acre											
	Second-year meadow, 1930				First-year meadow, 1930				Average, first and second-year meadow, 1924-30			
	Dry weight		Cured hay containing 15 per cent moisture		Dry weight		Cured hay containing 15 per cent moisture		Dry weight		Cured hay containing 15 per cent moisture	
	ton	lb.	ton	lb.	ton	lb.	ton	lb.	ton	lb.	ton	lb.
Treated	2	687	2	1,514	2	1,543	3	521	1	1,994	2	699
Untreated	2	696	2	1,525	2	1,642	3	638	1	1,824	2	499

The figures in this table do not show any significant difference between the treated and untreated seed. This may be explained by the fact that the various farm implements used in cultivating the ground have distributed the bacteria from other alfalfa areas. During the early years of the test, however, there was quite a marked advantage in favour of the treated seed. The farmers would be well advised not to neglect this feature when sowing alfalfa where none has been previously grown.

PRODUCTION OF SEED

RED CLOVER SEED PRODUCTION

The objects of this experiment are to compare the results 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 from seeding broadcast, in rows 12 inches apart, and in rows 24 inches apart, and also to compare the monetary return from red clover used as a hay crop versus when used as a seed crop.

The series which was harvested in 1930 was seeded on June 18, 1929, in quadruplicate one-fortieth-acre plots, using Alaska oats as a nurse-crop. The results are as follows:—

RESULTS OF RED CLOVER SEED PRODUCTION

Method of seeding and purpose of crop	Yield per acre					
	1930			Average 1924-30		
	Seed	Hay and clover straw	Value of crop	Seed	Hay and clover straw	
	bush. lb.	ton lb.	$	bush. lb.	ton	lb.
Broadcast, two cuttings for hay	.....	1 1,646	25 52	.....	1	1,808
Broadcast, first cutting for hay, second for seed	.....	1 1,646	25 52	.....	1	1,298
Broadcast, first cutting for seed	1 30	1 1,853	30 59	2 15	1	914
Rows 12 inches apart, first cutting for seed	1 20	1 1,150	26 42	2 10	1	747
Rows 24 inches apart, first cutting for seed	1 20	1 1,200	26 56	2 24	1	694

The second cutting always failed to give any seed.

There is not much difference in the yields of the different methods of seeding. However, the broadcast method would seem to be the best method to employ as there is less danger for the weeds to become established than where the seed is sown in rows.

With hay valued at $14 per ton, clover straw at $5.60 per ton, and clover seed at 22 cents per pound, the seed has given the better returns.

ALSIKE SEED PRODUCTION

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

In 1929 the first series of this experiment was seeded on June 18, the second on July 2, and the third on July 16, in quadruplicate one-fortieth-acre plots, using Alaska oats as a nurse-crop. The seed sown on July 16 never germinated, so there are no results to report in 1930. The rate of seeding was 5 pounds per acre. The results are as follows:—

ALSIKE SEED PRODUCTION—RESULTS IN 1930

Date of seeding	Yield per acre	
	Seeded with nurse-crop	Seeded without nurse-crop
	bush. lb.	bush. lb.
Seeded June 18	1 10	1 10
Seeded July 2	1 0	0 40
Seeded July 16	.....	.....

TIMOTHY SEED PRODUCTION

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

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

In 1928 this experiment was seeded on June 2, in quadruplicate one-fortieth-acre plots. In 1929 it was seeded on June 18, in a similar manner. The results to date are as follows:—

Method	Seed sown per acre	Yield per acre					
		Seeded 1929, yield 1930		Seeded 1928, yield 1930		Six-year average	
						First-year crop	Second-year crop
	lb.	bush.	lb.	bush.	lb.	bush. lb.	bush. lb.
Broadcast {red clover	8	.....		2	5	.....	4 23
Broadcast {timothy	10	.....		.....		.....	.....
Broadcast, timothy	10	2	36	3	6	2 46	5 5
Rows 12 inches apart	.....	2	19	3	37	2 35	5 3
Rows 24 inches apart	.....	2	22	5	10	2 23	5 17

The seed produced the second year from the plots that were sown with red clover and timothy is more or less a mixture as a percentage of the red clover remained in the plots. On the other hand, a good crop of hay is obtained from the mixed plots during the first year and the seed harvested the second year can in most cases be satisfactorily separated with a good fanning mill as these seeds differ considerably both as to size and weight.

In this way it might often be possible to avoid buying a supply of timothy seed by saving a selected area that had produced a crop of mixed hay the previous year.

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

It is quite evident that the second-year meadow tends to give a larger yield of seed than does the new meadow.

FERTILIZER EXPERIMENT

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

For this test, an area of clay-loam soil which appeared fairly uniform was selected in the autumn of 1925 and fall-ploughed. The O.P.V. was sown at the rate of two bushels of oats, one bushel of peas and one-half bushel of vetch per acre; barley at the rate of 2 bushels per acre seeded out with 8 pounds of timothy, 8 pounds of red clover and 2 pounds of alsike. They were all seeded in duplicate one-fortieth-acre plots.

The total quantity of fertilizer was applied to the O.P.V. the same date as the seed was sown with the exception of the nitrate of soda which was divided into two applications.

The following table shows the fertilizer applied and the average yields obtained for two complete cycles of the rotation.

Plot No.	Amount of fertilizer applied per acre						Average yield per acre											
							O.P.V.		Barley		First-year meadow				Second-year meadow			
							Crops 1926–27		Crops 1927–28		Crops 1928–29				Crops 1929–30			
	Manure	Nitrate of soda	Super-phosphate	Muriate of potash	Calcarous subsoil	Basic slag	Green weight	Dry weight	Grain	Straw	Green weight	Cured hay containing 15 per cent moisture			Green weight	Cured hay containing 15 per cent moisture		
	ton	lb.	lb.	lb.	ton	lb.	ton lb.	ton lb.	bush. lb.	ton lb.	ton lb.	ton lb.			ton lb.	ton lb.		
1	8						5 1,640	1 1,292	18 46	0 1,480	3 840	1 496			2 1,040	1 32		
2 (check)							4 1,830	1 816	16 22	0 1,280	2 1,570	1 172			2 10	0 1,574		
3		100	250	50			6 250	1 1,194	20 20	0 1,680	4 50	1 826			3 360	1 329		
4		100	250				6 1,260	1 1,689	17 24	0 1,300	4 40	1 994			2 1,930	1 179		
5			250	50			5 1,570	1 1,019	20 10	0 1,530	4 400	1 1,109			3 350	1 366		
6 (check)							5 480	1 713	20 10	0 1,500	2 1,780	1 307			1 1,940	0 1,500		
7		100		50			6 470	1 1,251	19 28	0 1,580	2 1,470	1 144			1 1,860	0 1,559		
8		100					5 1,550	1 1,159	16 12	0 1,350	2 1,290	1 116			1 1,220	0 1,249		
9			250				5 1,410	1 1,025	15 30	0 1,520	4 50	1 889			2 1,100	0 1,954		
10 (check)							4 1,270	1 602	17 34	0 1,230	2 1,400	1 222			1 1,310	0 1,242		
11					4		4 1,590	1 779	16 22	0 1,560	2 1,060	1 7			1 1,540	0 1,392		
12						500	7 380	1 1,441	15 40	0 1,370	4 380	1 1,022			2 1,340	1 109		
Average plots Nos. 2, 6 and 10							4 1,860	1 710	18 6	0 1,337	2 1,583	1 234			1 1,753	0 1,439		

This experiment will be repeated for a number of years and no definite conclusions should be drawn until further data are available. The results to date show that the application of nitrogen has proved beneficial for the O.P.V. crop, and that the hay crops have been increased by the application of phosphoric acid.

POULTRY

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

The work carried on during the year was very largely a continuation of that carried on in previous years. Feeding, breeding and hatching experiments were conducted.

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

Wheat, $2.23; oats, $2.10; corn, $2.65; barley, $2.35; bran, $1.32; middlings, $1.63; meat meal and beef scrap, $5.46; skim-milk, $0.50; oyster shell, $2.62; grit, $1.75; charcoal, $2.95; clover leaves, $1.

The eggs are valued at sixty cents per dozen for the six months from November 1 to April 30.

SKIM-MILK VERSUS BEEF SCRAP

The object of this experiment is to compare the results from the use of skim-milk and beef-scrap as a source of animal protein for winter egg production. In 1929-30 this test was commenced on November 1, and continued until April 30. One hundred pullets were used. These were divided into two pens of 50 birds each. The ration given to each pen was the same with the exception of the skim-milk and beef-scrap. The scratch grain consisted of two parts each of whole wheat and cracked corn and one part each of whole oats and barley. The dry mash was made up of equal parts of bran, middlings, corn meal, ground oats and ground barley. The beef-scrap was fed from the hopper and the skim-milk from a drinking vessel. Mineral matter, charcoal and green feed were also supplied to each lot. The results are as follows:—

SKIM-MILK VERSUS BEEF SCRAP

Items		1930		Six-year average	
		Skim-milk	Beef scrap	Skim-milk	Beef scrap
Number of birds	No.	50	50	50	50
Weight at beginning Nov. 1	lb.	270	274	245	242
Weight at finish April 30	lb.	293	290	278	278
Pounds of scratch	lb.	1,537	1,465	1,654	1,655
Pounds of mash	lb.	1,528	1,441	727	740
Pounds of green feed	lb.	265	245	321	306
Pounds of skim-milk	lb.	612	.....	1,231	.....
Pounds of beef scrap	lb.	.....	145	.....	122
Pounds of grit	lb.	11	9·9	32·3	23
Pounds of oyster shell	lb.	43	39	81·8	67
Pounds of charcoal	lb.	30	31	14·3	15
Number of eggs laid	No.	5,327	5,683	4,839·3	4,861·2
Cost of animal feed	$	3 06	7 92	6 16	6 42
Total cost of feed	$	75 06	76 15	73 69	73 71
Value of eggs laid	$	266 35	284 15	241 97	243 06
Cost per dozen	cts.	17·0	16·1	18·3	18·2
Profit	$	191 29	208 00	168 28	169 35

The figures for 1930 show little better results for the pen receiving beef scrap. However, over a six-year period there is very little difference between the results obtained from skim-milk and beef scrap. This would tend to indicate that farmers who have a supply of skim-milk would not benefit materially by purchasing other animal feed for poultry, while those who may not have any skim-milk may use beef scrap to as good advantage.

LIGHTS VERSUS NO LIGHTS

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

This test has been conducted for six years, using 100 pullets in each year. In 1929-30 it was commenced on November 1, and continued until April 30. The birds were divided equally into two pens of 50 each. All conditions were made similar except that the one pen had these extra hours of light to work. The results are as follows:—

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

Items		1930		Seven-year average	
		Lights	No lights	Lights	No lights
Number of birds	No.	50	50	50	50
Weight at beginning Nov. 1	lb.	254	265	225·7	232·0
Weight at finish April 30	lb.	313	292	269·4	265·6
Pounds of scratch	lb.	1,583	1,496	1,597·9	1,617·6
Pounds of mash	lb.	1,707	1,425	677·6	590·4
Pounds of green feed	lb.	259	248	288·7	291·4
Pounds of milk	lb.	622	582	629·0	613·0
Pounds of meat scrap	lb.	58	52	97·4	88·7
Pounds of grit	lb.	13	13	20·6	17·9
Pounds of oyster shell	lb.	41	33	66·4	60·4
Pounds of charcoal	lb.	31	26	17·4	12·3
Number of eggs laid	No.	5,656	4,722	4,250·3	3,873·3
Total cost of feed	$	88 20	78 61	71 12	68 79
Value of eggs laid	$	282 80	236 10	212 51	193 66
Cost per dozen	cts.	18·7	20·0	20·1	21·3
Profit	$	194 60	157 49	141 39	124 87

In order to determine what effect the lights used during the first six months, November 1 to April 30, would have on the total yearly production, the two pens were kept separated from May 1 to October 31. The pen that received

Poultry plant.

no electric lights produced 5,058 eggs, while the pen that received electric lights during the six winter months produced 4,260 eggs.

It would seem to indicate that the main advantage to be gained from the use of lights would appear to be that more eggs are obtained during the winter months when the price is high.

WATER VERSUS SNOW FOR WINTER EGG PRODUCTION

The object of this experiment is to compare the results from the use of water and snow for winter egg production, as it is often found difficult to keep water from freezing in cold weather, especially when it is impossible to attend to the birds many times each day. This test was commenced on November 1, 1929, and continued until April 30. One hundred pullets were used. These were divided into two pens of 50 birds each. The ration given to each pen was the same with the exception that one received water and the other snow. A thermic fountain was used for water and a large open vessel for snow. The results are as follows:—

SNOW VERSUS WATER

Items		Results 1930	
		Snow	Water
Number of birds	No.	50	50
Weight at beginning Nov. 1	lb.	271	250
Weight at finish April 30	lb.	301	283
Pounds of scratch	lb.	1,505	1,549
Pounds of mash	lb.	1,531	1,597
Pounds of green feed	lb.	250·5	258·2
Pounds of milk	lb.	585·0	599·0
Pounds of meat scrap	lb.	56·6	62·2
Pounds of grit	lb.	10·6	11·2
Pounds of oyster shell	lb.	36·4	35·3
Pounds of charcoal	lb.	30·0	30·4
Number of eggs laid	No.	5,314	5,516
Total cost of feed	$	81 74	84 77
Value of eggs laid	$	265 70	275 80
Cost per dozen	cts.	18·5	18·4
Profit	$	183 96	191 03

The figures in this table show that there is not a great difference between the results obtained from snow and water. This experiment will be repeated for a number of years, and no conclusion should be drawn on one year's work.

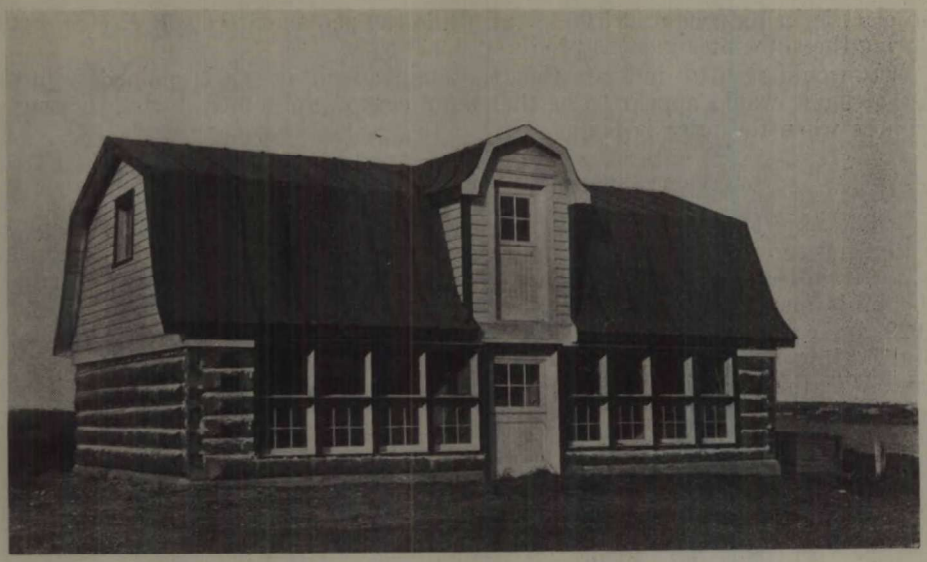
EFFECT OF SUPPLEMENTARY FEEDS ON FERTILITY, HATCHABILITY AND VIABILITY

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

In 1930 this test included 100 pedigree hens which were divided into ten pens of 10 birds each, making duplicate pens for each feed under test as well as the check pen which received the ordinary ration.

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

In order to eleminate any effect caused by the different males used, the experiment was divided into two periods with one week between. The first period covered the regular pedigree mating season when the male birds were



Cockerel house.

kept continuously in their respective pens, while the second period the male birds were alternated daily. During the first period 1,850 eggs were set and 866 during the second period. Separate records were kept for each of these two periods. The results are as follows:—

Effect of Supplementary Feeds on Fertility, Hatchability and Viability

Experimental ration	Number of eggs set	Per cent fertile	Per cent blood rings	Per cent dead germs	Per cent dead in shell	Per cent fertile hatched	Per cent mortality in first three weeks	Number of eggs required per chicks at three weeks
	No.	%	%	%	%	%	%	No.
Cod liver oil—								
Regular mating	318	85·8	5·0	13·8	16·4	59·0	5·0	2·1
Males alternated	165	98·2	5·5	9·7	32·7	51·2	7·2	2·1
Total	483	90·1	5·2	12·4	21·9	56·1	5·7	2·1
Five-year average	492	91·4	10·0	11·5	26·2	48·2	17·6	2·8
Raw liver—								
Regular mating	339	85·0	4·1	9·7	17·1	63·5	6·0	2·0
Males alternated	159	84·9	3·8	3·8	25·2	61·5	7·2	2·1
Total	498	84·9	4·0	7·8	19·7	62·9	6·4	2·0
Five-year average	543	94·4	7·7	7·9	23·4	58·6	15·8	2·1
Bone meal—								
Regular mating	392	88·5	5·6	7·1	23·7	58·8	2·0	2·0
Males alternated	172	89·5	4·7	5·2	33·7	51·3	0·0	2·2
Total	564	88·8	5·3	6·6	26·8	56·5	1·4	2·0
Five-year average	541	94·5	8·7	11·9	26·3	50·4	15·5	2·5
Cod liver oil and liver—								
Regular mating	433	85·7	5·8	9·5	18·7	60·4	4·0	2·0
Males alternated	196	87·2	3·6	3·6	25·0	63·2	2·8	1·9
Total	629	86·2	5·1	7·6	20·7	61·3	3·6	2·0
Five-year average	570	92·5	8·1	6·6	23·9	58·2	18·5	2·3
Ordinary ration—								
Regular mating	368	90·5	6·0	13·6	20·4	55·9	2·7	2·0
Males alternated	174	96·6	6·3	9·2	43·1	39·3	6·1	2·8
Total	542	92·4	6·1	12·2	27·7	50·3	3·6	2·2
Five year average	561	96·7	9·5	12·0	26·8	50·1	17·1	2·5

Over a period of years the raw liver has given the best results for hatchability, but the ordinary ration had the highest fertility. The lowest mortality was obtained with the lot receiving bone meal.

When the males are alternated there is a marked increase in the fertility of all pens except one, and a lowest percentage of dead germs.

This experiment is being repeated another year.

HATCHING RESULTS FROM DIFFERENT DATES OF SETTING

The hatching season at this Station covers a period of around three months and includes settings which are made during the months of March, April and May.

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

HATCHING RESULTS FROM DIFFERENT DATES OF SETTING

Month set	Number of eggs set	Per cent fertile	Per cent total eggs hatched	Per cent fertile eggs hatched	Per cent chicks hatched alive when wing banded	Total eggs required for one chick hatched	Total eggs required for one chick at three weeks
	No.	%	%	%	%	No.	No.
March, 1930	2,750	89·1	54·9	61·6	96·4	1·82	1·95
Average 7 years	1,274	87·3	48·9	56·0	85·7	2·04	2·39
April, 1930	3,100	92·0	49·7	54·0	95·3	2·01	2·24
Average 7 years	1,743	92·4	50·0	54·1	88·5	2·00	2·26
May, 1930	1,800	91·5	52·3	57·4	96·0	1·91	1·99
Average 7 years	983	91·1	50·5	55·4	87·1	1·98	2·28

The greatest fertility, over a seven-year average, was obtained from the April settings, and the lowest from the March settings.

Hatchability, as shown by the percentage of fertile eggs hatched over a seven-year period, was better from March settings, followed closely by settings of April and May.

The percentage of chicks alive when wing banded was the greatest from the April settings and the lowest from March settings.

COST OF ARTIFICIAL INCUBATION

With the object of determining the amount of fuel required and consequently the cost of hatchings, records were kept of the amount of coal oil used by each of the three No. 5 Buckeye machines which were in use. The following table gives the details of the test: —

COST OF ARTIFICIAL INCUBATION

Items		1930	Average five years
Number of settings	No.	14	7·8
Number of eggs	No.	7,650	4,361
Oil used	gal.	73·1	44·4
Cost of fuel	$	18 28	14 09
Cost per 100 eggs	$	0 24	0 32

COAL REQUIRED TO OPERATE BROODER STOVE

The object of this experiment is to compare the quantity and cost of coal required to operate the No. 118 Buckeye brooder stove and the No. 119 brooder stove of the same make. The No. 118 brooder is rated at a capacity of 500 chicks while the No. 119 is rated at 1,000 chicks. The following table gives the details of the test:—

COAL REQUIRED TO OPERATE BROODER STOVE

Items		Brooder No. 118		Brooder No. 119	
		April	May	April	May
Coal used per month	lb.	541	421	763	710
Coal used per day	lb.	18·0	13·6	25·4	22·9
Value of coal used	$	5 41	4 21	7 63	7 10
Capacity of brooder	No.	500	500	1,000	1,000
Cost per 100 chicks per month	$	1 08	0 84	0 76	0 71

RATIONS

In making up the rations as large a proportion of the common home grown grain as is consistent with a good ration should be used. The standard scratch ration used at this Station is composed of two parts each of whole wheat and cracked corn and one part each of whole oats and barley; while the laying mash consists of equal parts of bran, middlings or shorts, corn meal, crushed oats, and ground barley, plus ten per cent meat meal. Oyster-shell, grit, charcoal and in some cases beef scrap are available in hoppers at all times.

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

Clover or alfalfa leaves make a very convenient and excellent form of green feed. These are fed in the litter, from hopper, or steamed and mixed in the wet mash. Mangels, turnips and sprouted oats may also be used to good advantage.

PEDIGREE WORK

The exact egg production of each individual hen is obtained through the medium of the trapnest. This, together with the individuality and general type of the birds is used as the basis for utility selection. By this method, only those birds are used for breeding purposes which have pedigrees showing high production of good sized eggs and are also of desirable type. Particular attention is given to the selection of the males used and those whose sisters and daughters prove to be high producers are retained and used for a number of years. The selection of the breeding stock on the basis of production is probably the greatest single factor in increasing the production of the individual bird and, consequently, the average of the whole flock. The following table gives the total number of birds on hand on December 31 for the last eight years with production records of 150 eggs or over:—

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

Year	150 eggs or over	175 eggs or over	200 eggs or over	225 eggs or over	250 eggs or over	275 eggs or over	300 eggs or over	Total number of hens
1923	19	11	7	.....	.....	.....	.....	37
1924	44	24	10	.....	.....	.....	.....	78
1925	44	32	24	13	2	.....	1	116
1926	.....	40	40	23	14	5	.....	122
1927	.....	.....	41	57	33	5	2	138
1928	8	6	31	42	24	4	2	117
1929	7	11	17	15	9	.....	1	60
1930	.....	.....	44	46	17	1	2	110

BEES

From the beekeepers' viewpoint the spring and early summer of 1930 were favourable for building up the strength of colonies and for honey production. However, the comparatively hot, dry weather which prevailed throughout August and the early part of September may have been the cause of the low yields obtained during that period.

Black alder, as usual, was yielding pollen abundantly a week or two before the weather was warm enough for the bees to make extended flights. This pollen, however, was available until the willows were in bloom and they, in turn, lasted until the dandelion flow started. Pollen was first seen being taken into the hive on May 3.

The northern season, although rather short, is characterized by its compactness, that is, by its continuous honey flow. Each of the principal sources always extends into or overlaps the succeeding flow. Dandelions came into bloom during the last week of May and continued until the third week in June, while the White Dutch clover and the alsike clover came into bloom on June 13 and 20 respectively, and lasted until July 25. Alfalfa and sweet clover were both in bloom on June 16 and lasted until they were harvested, while the fireweed commenced about July 7 and lasted until the end of August. These sources were also supplemented by various cultivated fruits and several species of wild plants such as Labrador tea, Asters, wild raspberry and of genus prunus.

WEATHER AND HONEY FLOW

One colony was kept on scales and weighed daily at 7 o'clock a.m. throughout the season. The data thus obtained together with some meteorological data are tabulated below.

RECORD OF HIVE ON SCALES

—	May	June	July	August	September	Total
	lb.	lb.	lb.	lb.	lb.	lb.
1930	Loss 2·5	Gain 2·0	Gain 101·5	Gain 21·5	Loss 11·0	Gain 111·5
9-year average	Loss 7·8	Loss 0·1	Gain 75·9	Gain 52·7	Gain 8·5	Gain 128·8

DAILY GAIN OR LOSS AND METEOROLOGICAL DATA OF TWO PRINCIPAL MONTHS

Date	July 1930						August 1930					
	Gain	Loss	Temperature		Sunshine	Rainfall	Gain	Loss	Temperature		Sunshine	Rainfall
			Noon	Minimum					Noon	Minimum		
	lb.	lb.	°F.	°F.	hr.	in.	lb.	lb.	°F.	°F.	hr.	in.
1		1·0	54	48	4·5		1·0		66	50	6·1	
2		1·0	56	46	4·9			0·5	70	55	4·8	0·05
3			54	40	3·3		0·5		66	56	10·1	0·16
4	7·5		66	35	13·8		7·0		80	63	7·4	0·04
5	5·5		76	48	6·9			1·0	75	60	11·9	
6			70	58	3·5	0·46		2·0	64	49	11·6	
7			75	54	2·7	0·27			55	56	2·4	0·30
8	4·0		70	54	9·8		3·0		72	57	1·8	0·27
9	5·5		79	55	7·9	0·06			67	53	8·9	
10	6·0		69	51	11·7			0·5	66	49	10·4	
11			74	48	6·9	0·19		2·5	47	47		0·18
12	6·0		66	47	12·0	0·01			56	49	9·4	
13	0·5		65	48	0·6		1·0		78	57	10·8	
14		1·0	47	46		0·02		0·5	63	60	0·2	Trace
15	4·0		64	37	9·5			0·5	60	57	1·3	0·23
16		0·5	53	52	0·3	0·11		0·5	64	55	4·9	
17	2·5		59	52	7·0	0·50			69	51	12·9	
18	6·0		71	48	6·3				60	55	7·3	
19	6·0		67	49	1·7				59	51	11·0	
20	5·5		60	60	10·3		0·5		73	53	10·4	
21	12·0		77	53	8·2			1·0	74	43	7·2	
22	4·0		69	56			1·0		76	45	11·1	
23	4·5		64	48	13·0	0·35	1·5		80	46	11·0	
24	7·5		78	46	13·6		1·5		79	52	7·4	Trace
25		0·5	59	57	4·3		0·5		78	49	4·1	0·20
26	1·0		70	45	6·5	0·14	2·5		78	51	8·2	
27	13·5		80	58	12·8		3·0		77	53	9·9	
28	11·5		81	66	11·0	0·07	1·5		80	56	6·8	
29		2·5	64	52	7·0		3·5		69	58	9·6	0·02
30		2·0	56	43	7·2				59	49	4·3	0·31
31		3·0	62	64	15·3		2·5		72	46	10·5	
Total	113·5	11·5			223·0	3·08	30·5	9·0			234·0	1·76

OUTDOOR VERSUS CELLAR WINTERING

Fourteen colonies of about uniform strength were selected for use in this project. Three of these were placed in the office cellar and the remaining eleven were wintered outside. Each of these fourteen colonies was fed sugar syrup and prepared for winter in a similar way.

The three colonies wintered inside were placed in the cellar on November 16, 1929, and removed on April 26, 1930. One of the colonies was found dead from lack of stores and the other two had only 1·5 and 2·0 frames of bees respectively and were both short of stores. The air temperature in the cellar ranged from 35 degrees to 54 degrees F. during January; 35 degrees to 54 degrees during February; 38 degrees to 53 degrees during March; and 41 degrees to 50 degrees during April. The relative humidity averaged 55 for January; 54 for February, 63 for March and 84 for April.

The eleven colonies wintered outside were packed in single, double and quadruplicate cases. These cases allowed 6 inches of packing of well-dried planer shavings on the sides and underneath, and 10 to 12 inches on top. The packing was completed on October 1, 1929, and the unpacking commenced on May 5, 1930. At the first thorough examination in the spring these colonies, unlike those from the cellar, all had ample stores., The eleven colonies had an average of 4·3 frames of bees, but two of them were queenless.

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

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

Four of the colonies wintered outside were packed in quadruplicate, four in double and three in single wintering cases. The kind and amount of pack-

ing in each case was the same. The four colonies in quadruple cases came through alive with an average of 1·8 frames each of bees, two of which were queenless. The four colonies in double cases were all alive and queen-right with an average of 8·1 frames each of bees. The three single cases were also alive and queen-right with an average of 4·0 frames each of bees.

WINTERING TWO QUEENS IN ONE HIVE

To ascertain the possibility of wintering extra queens to be used the following spring in requeening queenless colonies or replacing weak and failing queens, two weak colonies were placed in one hive which had a tight-fitting division board and a double entrance provided. Of the two queens so wintered only one was alive in the spring. However, upon closer examination it was found that a hole had been gnawed through the thin division board, and the queen may have been destroyed by the bees from the opposite side.

During the past six years a total of 12 of these double hives, containing in all 24 colonies, were prepared. Of these 12 double hives, 4 or 33⅓ per cent were found, in the spring, to have the two queens. The remaining 8 double hives had lost either one or both queens.

PACKAGE BEES VERSUS OVER-WINTERED COLONIES AND AS A MEANS OF STARTING COLONIES

On May 17, eight 2-pound and four 3-pound packages were received. These were treated and installed in their hives in the manner outlined in the pamphlet No. 107 "Package Bees and How to Install Them."* Four 2-pound packages were started on foundation and four of the 2-pound packages and the four 3-pound packages were started on drawn combs. They were all fed sugar syrup until the nectar flow commenced. The 12 queens were accepted and commenced laying two or three days after the packages were installed.

One of the 3-pound packages, owing to difficulty in requeening, was queenless during the early part of the main nectar flow, so it it is not included in the following table:—

PACKAGE BEES VERSUS OVER-WINTERED COLONIES, AND AS A MEANS OF STARTING COLONIES

2-pound packages on comb			3-pound packages on comb			2-pound packages on foundation				Over-wintered colonies	
Hive number	Number of frames containing brood on July 9	Surplus honey produced	Hive number	Number of frames containing brood on July 9	Surplus honey produced	Hive number	Number of frames containing brood on July 9	Surplus honey produced	Number of new combs drawn	Hive number	Surplus honey produced
		lb.			lb.			lb.			lb.
204	9	44·6	209	9	69·0	206	11	55·7	27	210	65·8
205	10	72·2	216	11	80·1	215	11	44·1	22	226	109·3
208	12	68·4	218	11	50·4	220	10	61·5	30	247	138·5
213	10	64·2	.....	.....	.....	230	10	54·2	30	248	147·0
Average	10½	62·4	.....	10⅓	69·5	.....	10½	53·9	27	.....	115·2

The above figures indicate that colonies can be quite successfully established by securing either 2- or 3-pound package bees even when no drawn comb is available. This latter point is important because it shows that a beginner can get established without having on hand or purchasing any second-hand equipment whatever, and this materially lessens the danger of spreading disease.

* Pamphlet No. 107 may be obtained free from the Publication Branch, Department of Agriculture, Ottawa, Ont.

METHOD OF DETECTING PREPARATION FOR SWARMING

Ten colonies were used for this experiment. The object is to ascertain if preparation for swarming can be detected by tipping the upper part of a double brood chamber and looking for queen cells along the bottom bar of the frames. The shallow supers were added to the brood-chamber early in the season.

All these colonies commenced their first queen cells along the bottom bars in the top brood-chamber and the cells were easily detected by tipping. It would seem to indicate that the method would be fairly reliable as a means of detecting swarming preparations.

SWARM CONTROL

Separation of Queen and Brood.—The procedure of this method is to raise above a queen excluder, all frames containing eggs and brood when larvæ is first seen in queen cells. The queen is left below on a set of empty combs with a few bees shaken from one of the brood combs. All the queen cells are destroyed at the time of this manipulation, and again nine or ten days later.

This method proved quite effective as, out of six colonies so treated, only one commenced building queen cells shortly after being treated. This one, however, was a package which was started on foundation only.

Dequeening and Requeening.—When using this method the queen is removed and the queen cells are destroyed as soon as the larvæ are first noticed in the queen cells. The colony is left queenless for nine or ten days. The queen cells are again destroyed at the end of this period and another queen or a suitable ripe cell is introduced.

Only one of the five colonies treated by this method made preparation for swarming the second time. This one reactor was also a package which was started on foundation only. This method would also be a fairly reliable means of control.

QUEEN REARING

Controlled mating of queen bees is possible at this Station as there are no other apiaries within flying distance.

The queenless and broodless colony method of starting cells was used throughout the season. The started cells were transferred to the upper brood-chamber of the finishing colony during the day following the grafting. Artificial wax cells, using wooden cells for a base, were generally used, and the matings were done from double three-Langstroth-frame sized mating boxes.

Of the total number of cells grafted 90·8 per cent were finished. From the cells introduced to the mating boxes, 50 per cent of the virgins were successfully mated, 36 per cent were lost from the mating-boxes, and 14 per cent were destroyed for various reasons such as retarded mating, maimed, etc.

A number of queens were found being balled by bees on the ground and at the entrance of queen-right colonies. This would seem to indicate that the mating-boxes should not be too close to strong colonies as bees apparently have an antagonistic feeling toward strange queens.

FIBRE CROPS

Variety Test with Flax

Only one variety, J.W.S., was under test. The seed was sown on June 7, in triplicate one-fortieth-acre plots at the rate of 1½ bushels per acre. The crop was pulled on September 22. The average height was 33 inches and the average yield of dry matter was 2 tons 239 pounds.

Variety Test with Hemp

Only one variety, Minnesota No. 8, was under test. The seed was sown on June 7, in quadruplicate one-fortieth-acre plots at the rate of 1½ bushels per acre. The crop was harvested on September 10. The average height was 41 inches and the average yield per acre of dry matter was 2 tons 881 pounds.

ILLUSTRATION STATIONS

Of the twenty Illustration Stations operated under the supervision of this Station in 1929, seven were transferred to the eastern and central Quebec districts. The operators and locations of the thirteen Stations left under the supervision of this Experimental Station are as follows: A. Brouard, Mattice; Basile Gaudreault, Moonbeam; E. D. Carrere, Cochrane; Olivier Génier, Génier; H. Labrèche, Val Gagné; A. Beaudry, Verner; E. Strain, Gore Bay; Wm. McColeman, Spring Bay; Wm. A. Hare, Mindemoya; Jos. Desrochers, La Reine; Jos. Lemoine, Ste. Rose de Poularies; H. Marcotte, Barraute; and Eugène Robitaille, Belcourt. A new station was also started during the summer at Earlton and is operated by Michel Paiement.

On five of these Stations a four-year rotation has been started as follows:—

First year—hoed crops.
Second year—grain.
Third year—clover hay.
Fourth year—mixed hay.

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

First year—hoed crops.
Second year—grain.
Third year—clover hay.
Fourth year—mixed hay.
Fifth year—mixed hay.

On three the following six-year rotation is in use:—

First year—hoed crops.
Second year—grain.
Third year—clover hay.
Fourth year—mixed hay.
Fifth year—mixed hay.
Sixth year—mixed hay.

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

First year—grain.
Second year—clover seed.
Third year—hoed crops.
Fourth year—grain.
Fifth year—clover hay.
Sixth year—timothy hay.

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

Records are kept of the yield and cost of production of the various crops grown. The varieties of cereals that have been found to give the best results on the Experimental Station are given further test on these Stations and in this

way the value of these varieties for different sections is determined. The grading up of the dairy herd by the use of high-quality pure-bred bulls and the keeping of individual milk records are also featured and tangible results have been obtained. A field crop competition with swede turnips which has been carried on the last two years has established this culture permanently in that particular district.

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

A detailed report on these Stations may be found in the 1930 report of the Chief Supervisor (Eastern Edition).

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