DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
DOMINION EXPERIMENTAL FARMS

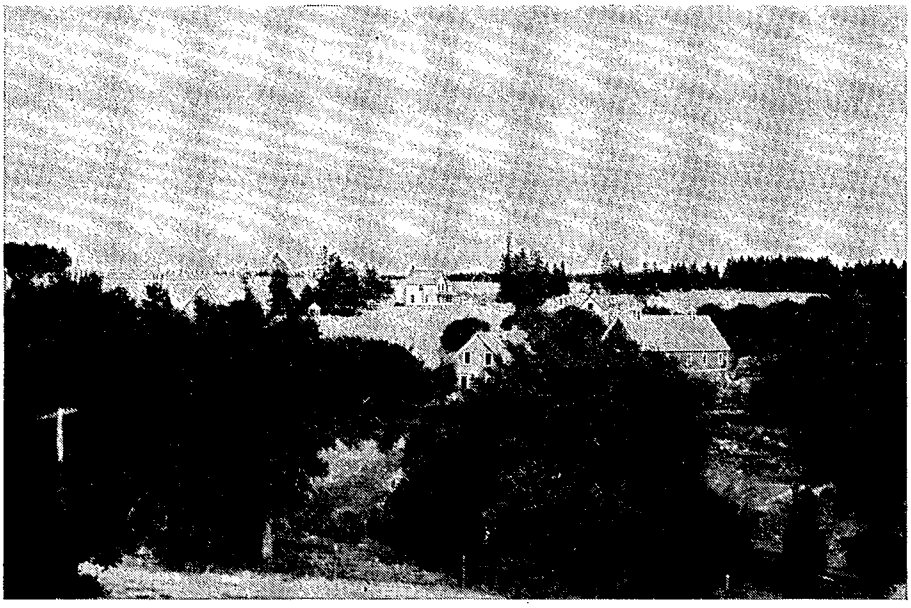
EXPERIMENTAL FARM

NAPPAN, N.S.

REPORT OF THE SUPERINTENDENT

W. W. BAIRD, B.S.A.

FOR THE YEAR 1930



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DOMINION EXPERIMENTAL FARM, NAPPAN, N.S.

REPORT OF THE SUPERINTENDENT, W. W. BAIRD, B.S.A.

THE SEASON

The winter of 1929-30 was fairly typical winter weather, until February 20. From then on, the weather became milder and the thin blanket of snow soon disappeared from the fields. Much thawing and freezing was experienced during March and April, which greatly reduced the clover yields throughout this district. The month of April was very dry and fine, though fairly cool and the soil was in fairly good condition to work by the first of May. Spring opened earlier than usual and seeding became general about three weeks ahead of 1929.

Precipitation was very light throughout the entire season, but especially so during April, May and June. Consequently, germination and growth were very slow during the first part of the growing season. During July, 3·44 inches of rain fell and this proved very beneficial to all crops.

The season was rather an exceptional one, for even though the records showed a great decrease in precipitation over previous years, all crops in this district made wonderfully good growth and the yields were also good, as you will note from the tables given in the respective divisions.

Good weather was experienced for the harvesting of all crops and both grain and roots were stored in splendid condition. The weather conditions continued good throughout the fall, thus affording a good opportunity for fall ploughing.

Winter weather began the last week of October and gradually it got colder, though no very severe frosts were recorded until November 29. Snow fell on the 28th, leaving a uniform blanket over all the fields.

The following table gives the meteorological records for the year:—

METEOROLOGICAL RECORDS, 1930

Month	Temperature				Precipitation						Sunshine		
	Maximum	Minimum	Mean	Average for 22 years	Rainfall		Snowfall		Total	Average for 23 years	1930		Average for 19 years
	°F.	°F.	°F.	°F.	days	in.	days	in.	in.	in.	days	hours	hours
January	52	−25	17·13	17·23	5	1·79	7	17·5	3·54	3·02	20	95·3	95·4
February	46	−12	17·85	16·42	3	0·95	7	22·5	3·20	2·75	22	123·0	106·4
March	55	− 3	29·58	26·39	9	2·45	2	3·5	2·80	2·82	23	134·0	123·3
April	64	16	37·63	37·58	6	0·82	1	1·5	0·97	2·68	24	172·7	139·7
May	72	26	48·47	48·51	10	1·86	.....	.....	1·86	2·36	26	218·1	181·7
June	88	35	65·68	57·85	10	1·76	.....	.....	1·76	2·80	30	261·6	211·0
July	83	46	66·05	64·33	9	3·44	.....	.....	3·44	3·08	31	238·3	219·8
August	84	41	63·56	62·98	10	2·26	.....	.....	2·26	3·35	30	255·5	212·7
September	82	34	58·75	55·74	6	2·35	.....	.....	2·35	3·01	28	181·0	163·9
October	80	20	46·96	46·94	11	4·47	.....	.....	4·47	3·73	21	125·5	125·2
November	60	8	36·68	35·88	5	0·92	2	10·0	1·92	3·24	25	116·9	85·0
December	53	− 4	23·11	22·86	3	1·95	8	23·5	4·30	3·70	20	70·5	75·4

Total precipitation..... 32·87 inches
Average precipitation for 23 years..... 36·54 "

Days of rainfall..... 87
Days of snowfall..... 27
Days of sunshine..... 300

Inches of rainfall..... 25·02
Inches of snowfall (equal to 7·85 inches rain)..... 78·5
Hours of sunshine..... 1992·4
Average hours of sunshine for 19 years..... 1739·5

ANIMAL HUSBANDRY

The work carried on in this division in 1930 consisted of breeding and feeding projects with dairy cattle, sheep and swine and feeding projects with beef steers.

DAIRY CATTLE

The following dairy cattle were on hand on January 1, 1931:—

	Pure-bred Guernseys	Pure-bred Jerseys
Mature bulls	2	2
Yearling bulls	2	1
Bull calves	5	4
Mature cows	12	4
Four-year-old cows	4	2
Three-year-old cows	4	3
Two-year-old heifers	8	1
Yearling heifers	10	2
Heifer calves	9	4
Total	56	23

The dairy herd passed the tenth consecutive clean test for tuberculosis in 1930 and has been fully accredited since 1922. It has also passed five consecutive blood tests for contagious abortion without a reactor.

GUERNSEYS

The Guernsey herd shows a net increase of six head over 1929, two males and four females. Five low producing females were culled during the year and two bull calves out of R.O.P. dams were sold for breeding purposes. Five cows and two bulls qualified in the Record of Performance in 1930. The herd sires now in service are Blanche's Raider of Nappan—3602—R.O.P. No. 38, his son, Canadian Raider—5111—and his grandson, Nappan Raider—8376. The dams of these three bulls have an aggregate of 10 R.O.P. records averaging 9,232 pounds of milk and 503 pounds butterfat, four of the records being made under 5 years of age, and all but one made at this Farm.

Following are the individual records of all Guernseys completing a lactation period in 1929, and also the average of the herd since its inception in 1920:—

GUERNSEYS—INDIVIDUAL MILK RECORDS COMPLETED DURING THE YEAR 1930

Name of cow	Date of dropping calf	Age at beginning of period	Number of days in milk	Total pounds of milk produced	Daily average yield of milk	Average per cent fat in milk	Pounds butter produced, 85 per cent butterfat	Value of butter at 37 cents per pound	Value of skim-milk at 20 cents per cwt.	Total value of product	Amount of meal eaten at $2 per cwt.	Amount of roots eaten at $4.70 per ton	Amount of hay eaten at $10 per ton	Amount of greenfeed eaten at $4 per ton	Amount of ensilage eaten at $4.20 per ton	Months on pasture at $2 per month	Total cost of feed for period	Cost of feed to produce 100 pounds milk	Cost of feed to produce 1 pound butter, skim-milk neglected	Profit on 1 pound butter, skim-milk neglected	Profit per cow for period—labour and calf neglected
				lb.	lo.	%	lb.	$	$	$	lb.	lb.	lb.	lb.	lb.		$	$	cts.	cts.	$
Cabbage Rose of Hillside—1909	Feb. 15, 1930	13	266	6,054·8	22·76	5·16+	367·67	136 04	11 48	147 52	1,744	3,295	3,002	.....	3,220	4 1/15	72 93	1 20	20	17	74 59
Princess Daisy of Hillside—2039	April 30, 1929	13	366	5,057·4	13·82	5·31+	316·16	116 98	9 58	126 56	1,831	7,535	5,055	1,412	3,145	2 7/10	95 63	1 89	30	7	30 93
Patricia of Nappan—3086	May 1, 1929	6	298	4,216·2	14·15	5·93+	294·33	108 90	7 93	116 83	1,417	9,160	4,882	1,412	1,870	3 2/10	87 63	2 08	30	7	29 20
Nappan Stannox—3615	Oct. 6, 1929	5	307	5,670·1	18·47	5·33—	355·27	131 45	10 74	142 19	1,896	4,025	3,464	952	3,075	4 2/20	81 53	1 44	23	14	60 66
Nappan Stannox 2nd—3616	May 21, 1929	5	315	4,687·4	14·88	5·28—	291·16	107 73	8 88	116 61	1,439	5,635	3,789	1,412	2,595	3 3/10	75 84	1 62	26	11	40 77
Nappan Dairymaid—4943	May 7, 1930	4	208	4,139·5	19·90	5·59+	272·36	100 77	7 82	108 59	1,256	1,725	2,604	.....	4,270	4 1/15	59 69	1 44	22	15	48 90
Nappan Cabbage Rose—4055	May 4, 1929	4	331	4,963·1	14·99	5·37+	313·71	116 07	9 39	125 46	1,727	8,085	4,605	1,412	2,245	3 3/10	90 70	1 83	29	8	34 76
Nappan Blanche—4056	Dec. 24, 1929	4	310	7,390·5	23·84	4·89—	424·91	157 22	14 06	171 28	2,425	4,530	3,470	480	3,415	4 1/15	93 16	1 26	22	15	78 12
Nappan Princess—4947	Dec. 25, 1928	3	402	6,619·1	16·47	4·77+	371·62	137 50	12 61	150 11	2,256	10,120	4,808	1,412	1,870	3 3/10	106 29	1 61	29	8	43 82
Nappan Princess 2nd—6235	Dec. 22, 1929	3	366	7,911·9	21·62	4·60+	428·48	158 54	15 10	173 64	2,695	7,160	4,226	480	3,415	4 1/15	108 52	1 37	25	12	65 12
Nappan Dairymaid—4943	May 26, 1929	3	251	4,317·7	17·20	5·89+	299·44	110 79	8 13	118 92	1,265	3,260	2,456	1,412	1,870	3 3/10	58 59	1 36	20	17	60 33
Nappan Rose 2nd—4946	May 6, 1929	3	367	6,852·9	18·67	5·45+	439·69	162 69	12 96	175 65	2,064	7,115	4,712	1,412	3,355	3 3/10	98 03	1 43	22	15	77 62
Nappan Red Rose—4944	Dec. 13, 1929	3	311	8,515·5	27·38	5·14+	515·34	190 68	16 15	206 83	2,421	5,096	3,114	630	3,285	4 1/15	92 66	1 09	18	19	114 17
Nappan Glamour—5556	Dec. 30, 1929	3	274	5,238·1	19·12	5·20+	320·54	118 60	9 93	128 53	2,034	4,900	3,064	480	2,665	4 1/15	82 60	1 58	26	11	45 93
Nappan Primula 2nd—5625	May 28, 1929	2	337	5,081·8	15·08	5·33—	318·60	117 88	9 62	127 50	1,559	4,585	3,183	1,412	2,270	3 3/10	72 06	1 42	23	14	55 44
Nappan Daisy 2nd—5632	Nov. 27, 1929	2	308	7,218·1	23·44	5·80+	492·80	182 34	13 60	195 94	2,320	4,430	2,740	.....	2,505	4 1/15	84 30	1 17	17	20	111 64
Total for herd—16 lactations	.....	....	5,017	93,934·1	.....	.....	5,822·08	2,154 18	177 98	2,332 16	30,349	90,656	59,174	14,318	45,070	6 1/2	1,360 16	.....	.....	.....	972 00
Average for herd—16 lactations	.....	4·75	314	5,870·9	18·72	5·27—	363·88	134 64	11 12	145 76	1,897	5,666	3,698	895	2,817	3·78	85 01	1 45	23	14	60 75
Average 1922-30—117 lactations	.....	4·84	339	5,660·1	16·69	5·33	354·82	145 49	10 72	156 21	2,403	5,494	3,854	1,589	1,642	4·42	96 29	1 70	27	14	59 93

FINANCIAL STATEMENT OF GUERNSEY HERD, 1930

To Feed cost for sixteen cows		$ 1,360 16
Feed cost for ten heifers to one year of age		304 19
Feed cost for two bulls to one year of age		58 90
Feed cost for two bull calves to date of sale		46 06
16 bull services at $5		80 00
25 tons straw at $5		125 00
		$ 1,974 31
By—		
Sale of 5,822·08 pounds butter at 37 cents per pound		$ 2,154 18
Sale of 88,990 pounds skim-milk at 20 cents per cwt		177 98
Sale of 2 bulls for breeders		175 17
Sale of 8 calfskins		3 85
9 heifer calves on hand at $75		675 00
5 bull calves on hand at $50		250 00
175 tons manure at $2		350 00
		$ 3,786 18
Credit balance		$ 1,811 87

FINANCIAL STATEMENT FOR NINE-YEAR PERIOD

Year	Number of lactations	Debit	Credit	Credit balance
		$ cts.	$ cts.	$ cts.
1922-29	101	15,010 17	26,990 09	11,979 92
1930	16	1,974 31	3,786 18	1,811 87
Total	117	16,984 48	30,776 27	13,791 79
Average—1 year	13	1,887 16	3,419 58	1,532 42
Average—1 lactation	1	145 17	263 05	117 88

JERSEYS

The Jersey herd established in 1928-29 was increased by nine head during 1930. Eight calves were dropped, one cow and one bull purchased, and one bull disposed of.

The cow purchased, Belle of the Priory 4th (Imp.)—45604, has a three-year-old record of 11,003 pounds milk and 578 pounds butterfat. The bull, Gem's Nobly Born—52891, is a son of the $25,000 bull Imp. Nobly Born. His dam has two records that average 12,557 pounds milk and 670 pounds butterfat.

Four of the females in the herd have completed qualifying records in the R.O.P. since they were purchased.

The following table gives the individual records completed during 1930:—

JERSEYS—INDIVIDUAL MILK RECORDS COMPLETED DURING THE YEAR 1930

Name of cow	Date of dropping calf	Age at beginning of period	Number of days in milk	Total pounds of milk produced	Daily average yield of milk	Average per cent fat in milk	Pounds butter produced, 85 per cent butterfat	Value of butter at 37 cents per pound	Value of skim-milk at 20 cents per cwt.	Total value of product	Amount of meal eaten at $2 per cwt.	Amount of roots eaten at $4.70 per ton	Amount of hay eaten at $10 per ton	Amount of greenfeed eaten at $4 per ton	Amount of ensilage eaten at $4.20 per ton	Months on pasture at $2 per month	Total cost of feed for period	Cost of feed to produce 100 pounds milk	Cost of feed to produce 1 pound butter, skim-milk neglected	Profit on 1 pound butter, skim-milk neglected	Profit per cow for period—labour and calf neglected
				lb.	lb.	%	lb.	$	$	$	lb.	lb.	lb.	lb.	lb.		$	$	cts.	cts.	$
Marionette of Wellington—23439	Nov. 25, 1928	8	426	8,615·4	20·22	5·11—	517·65	191 53	16 35	207 88	2,574	10,370	4,682	1,412	1,870	3 3/10	112 61	1 31	22	15	95 27
Bessie's Sunray—25645	June 4, 1929	4	300	7,032·0	23·44	5·35+	442·72	163 81	13 31	177 12	2,199	5,875	3,661	1,412	2,245	3 3/10	90 23	1 28	20	17	86 89
Lena of Clifton—33302	Dec. 1, 1928	3	538	11,965·0	22·24	4·81+	677·24	250 58	22 78	273 36	3,600	11,435	6,336	1,412	4,225	3 13/30	149 12	1 25	22	15	124 24
Goldie of Roseland—26344	Aug. 22, 1929	5	326	5,927·6	18·18	5·24—	365·12	135 09	11 23	146 32	2,063	4,230	3,464	1,132	2,990	4 3/5	86 26	1 46	24	13	60 06
Palatine Observer Beauty—45662	Sept. 19, 1929	2	315	6,499·4	20·63	5·73+	438·33	162 18	12 25	174 43	2,248	4,585	3,464	658	2,645	2 1/15	84 46	1 30	19	18	89 97
Palatine's Manor Starlight—45660	Sept. 19, 1929	2	306	5,688·5	18·59	5·81—	388·59	143 78	10 72	154 50	1,996	4,585	3,464	658	2,645	2	78 89	1 39	20	17	75 61
Palatine's Romola—45663	Aug. 28, 1929	2	337	5,166·8	15·33	6·18—	375·53	138 95	9 70	148 65	2,049	4,585	3,464	1,024	2,745	2 13/15	82 62	1 60	22	15	66 03
Baby Princess Palatine—45664	April 19, 1929	2	315	4,982·4	15·82	5·35+	313·68	116 06	9 43	125 49	1,679	4,410	2,892	1,412	1,870	3 3/10	71 75	1 44	23	14	53 74
Average for herd—8 lactations	....		358	6,984·6	19·52	5·38	439·86	162 75	13 22	175 97	2,301	6,259	3,928	1,140	2,654	3 1/8	94 49	1 35	21·5	15·5	81 48

FINANCIAL STATEMENT OF JERSEY HERD, 1930

To Feed cost for eight cows		$ 755·94
Feed cost for two heifers to one year of age		55 36
Feed cost for 1 bull to one year of age		39 03
Feed cost for three calves to Jan. 1, 1931, or to date of disposal		30 91
8 bull services at $5		40 00
10 tons straw at $5		50 00
		$ 971 24
By—		
Sale of 3,518·86 pounds butter at 37 cents per pound		$ 1,301 98
Sale of 52,885 pounds skim-milk at 20 cents per cwt.		105 77
Sale of 1 bull for breeder		125 00
4 heifer calves on hand at $75		300 00
4 bull calves on hand at $50		200 00
80 tons manure at $2		160 00
		$ 2,192 75
Credit balance		$ 1,221 51

COST OF MILK PRODUCTION

Records are kept on the feed cost of milk production for both herds. Following are the data collected in 1930:—

COST OF PRODUCTION OF MILK FOR THE GUERNSEY HERD

Amount of feed per 100 pounds milk	Price of feed	Cost of feed per 100 pounds milk
Meal—32·31 pounds	$2 00 per cwt.	$0·646
Roots—96·51 pounds	4 70 per ton	0·227
Hay—63·00 pounds	10 00 "	0·315
Ensilage—47·98 pounds	4 20 "	0·101
Greenfeed—15·24 pounds	4 00 "	0·030
Pasture—1·96 days	2 00 per month	0·131
		$1·450
Nine-year Average		
Meal—42·45 pounds	2 02 per cwt.	$0·857
Roots and ensilage—126·08 pounds	4 32 per ton	0·272
Hay—68·1 pounds	9 74 "	0·332
Greenfeed—28·07 pounds	4 18 "	0·059
Pasture—2·34 days	2 00 per month	0·156
		$1·676

The average butterfat percentage in 1930 was 5·27 and the feed cost per pound was 27·5 cents. The nine-year average butterfat percentage was 5·33 with a feed cost of 31·44 cents.

COST OF PRODUCTION OF MILK FOR THE JERSEY HERD, 1930

Amount of feed per 100 pounds milk	Price of feed	Cost of feed per 100 pounds milk
Meal—32·94 pounds	$2 00 per cwt.	$0·659
Roots—89·62 pounds	4 70 per ton	0·211
Hay—56·24 pounds	10 00 "	0·281
Ensilage—38·00 pounds	4 20 "	0·080
Greenfeed—16·32 pounds	4 00 "	0·033
Pasture 1·35 days	2 00 per month	0·090
		$1·354

The average butterfat percentage was 5·38 and the feed cost per pound was 25·17 cents.

The following tables give the weekly and monthly cost of milk production for the Guernsey and Jersey herds:—

MONTHLY FEED COST OF MILK AND BUTTERFAT PRODUCTION

Month	Guernseys				Jerseys	
	1930		7-year average		1930	
	Milk	Butterfat	Milk	Butterfat	Milk	Butterfat
	$	cts.	$	cts.	$	cts.
January	1 72	32·5	1 84	34·7	1 98	36·8
February	1 81	34·2	1 78	33·6	1 96	36·4
March	1 48	27·9	1 75	33·0	1 97	36·6
April	1 44	27·2	1 77	33·4	1 57	29·2
May	1 32	24·9	1 73	32·7	1 35	25·1
June	0 49	9·2	1 10	20·8	0 51	9·5
July	0 47	8·9	0 76	14·3	0 48	8·9
August	0 97	18·3	1 17	22·1	0 85	15·8
September	1 29	24·3	1 51	28·5	0 98	18·2
October	1 61	30·4	1 71	32·3	1 15	21·4
November	1 87	35·3	1 87	35·3	1 44	26·8
December	1 73	32·7	1 88	35·5	1 46	27·1

COST OF REARING DAIRY CALVES FROM BIRTH TO ONE YEAR OF AGE

Item		Guernseys			Jerseys
		Heifers		Bulls	Heifers
		1930	10-year average	1930	1930
Number of animals	No.	10	54	2	2
Whole milk consumed per head	lb.	635	1,197	695	820
Skim milk consumed per head	"	3,238	3,385	2,254	2,554
Meal consumed per head	"	307	476	310	167
Roots consumed per head	"	507	848	389	345
Ensilage consumed per head	"	484		484	305
Hay consumed per head	"	1,304	1,337	1,168	720
Pasture per head	months	0·5	0·42	1·53	2·87
Cost of feed per head	$	30 42	47 71	29 45	27 68

Feed prices used for 1930:—

Whole milk	$ 1 40 per cwt.
Skim-milk	4 00 per ton
Meal	1 90 per cwt.
Roots	4 70 per ton
Ensilage	4 20 per ton
Hay	10 00 per ton
Pasture	1 00 per month

COST OF REARING GUERNSEY HEIFERS FROM BIRTH TO DATE OF DROPPING FIRST CALF

Items		From birth to one year of age, 9-year average	From one year of age to date of dropping first calf		Totals, 9-year average
			1930	9-year average	
Number of heifers	No.	41	7	41	41
Average number days fed	"	365	471	531	896
Whole milk consumed per head	lb.	1,369	.....	.....	1,369
Skim-milk consumed per head	"	3,454	.....	.....	3,454
Meal consumed per head	"	541	289	1,179	1,720
Roots consumed per head	"	833	2,764	3,589	5,588
Ensilage consumed per head	"		1,393	1,166	
Hay consumed per head	"	1,390	2,354	3,606	4,996
Green feed consumed per head	"	134	.....	597	731
Pasture per head	months	.....	6·77	6·24	6·24
Cost of feed per head	$	53 38	40 21	63 30	116 68

The feed prices used in the above table were the same as for the heifer calves excepting the charge for pasture, which was $2 per month.

The cost of rearing dairy heifers was lower during 1930 than in previous years. This was due chiefly to two factors: first, a lower feed cost and, second, a decrease in the amount of whole milk and meal fed. Early fall calves were turned on pasture. Careful attention to pasture improvement has resulted in a better quality of feed, thus enabling these calves to make better gains than where the pastures are old and poor. The calves are given a good start for the first few months and then rough it as yearlings, with little or no meal until a short time previous to calving.

Cost studies such as those given above show clearly the folly of rearing poorly bred heifers. The cost is just as great as for a well-bred animal, but the returns are much lower. The use of good pure-bred sires eliminates a great deal of the chance associated with animal breeding and the experience of successful live stock breeders shows the value to be derived from such a practice. The ability to produce milk and butterfat in paying quantities is inherited and it is in the breeder's own interest to see to it that his herd carries these inherited qualities to as great a degree as possible. Progressive breeding policies are established in this way.

FEED COST OF MAINTAINING MATURE DAIRY BULLS FOR ONE YEAR

Year	Number of bulls	Average feeds consumed per head					Feed cost average
		Meal $1.90 per cwt.	Roots $4.70 per ton	Ensilage $4.20 per ton	Hay $10 per ton	Green feed $4 per ton	
		lb.	lb.	lb.	lb.	lb.	$
1930	3	365	1,910	5,390	5,110	.....	48 29
Average (6 years)	1	1,362	2,514	2,516	4,633	.....	63 73

FEEDING EXPERIMENTS

ROOTS VERSUS SILAGE

An experiment was conducted during the winter of 1930 comparing turnips with sunflower silage for milk production. This was a replication of experiments carried on in previous years. Four cows were used in this experiment. The plan of the test was as follows:—

Period 1.—The cows were fed turnips for three weeks, the third week's production being used in analyzing the results.

Period 2.—A gradual change was made to sunflower silage and they were fed for three weeks on this feed, the production for the third week being used as before.

Period 3.—A gradual change was made back to turnips and the third week was again taken as the experimental period. Periods 1 and 3 were averaged to compare with Period 2. Meal and hay rations were kept constant throughout the test.

The results of this test and the average of eight similar feeding trials are given in the following tables:—

TURNIPS VERSUS SUNFLOWER SILAGE—1930

Item		Period 1, turnips	Period 2, sunflower silage	Period 3, turnips	Average periods 1 and 3 turnips
Number of cows on test	No.	4	4	4	4
Pounds milk produced in 7 days	lb.	478·6	435·1	434·2	456·4
Average pounds milk per cow per day	"	17·1	15·5	15·5	16·3
Average per cent fat	%	6·00	5·96	5·92	5·96
Total pounds fat produced	lb.	28·7	25·9	25·7	27·2
Average pounds fat per cow per day	"	1·025	0·925	0·918	0·971
Total meal consumed	"	196	196	196	196
Total hay consumed	"	420	420	420	420
Total turnips consumed	"	1,120	.....	840	980
Total silage consumed	"	.....	420	.....	.....
Pounds meal per 100 pounds milk	"	40·95	45·05	45·14	42·95
Pounds turnips per 100 pounds milk	"	234·0	.....	193·5	214·7
Pounds silage per 100 pounds milk	"	.....	96·5	.....	.....
Findings from Experiment					
Cost of meal at $2.10 per cwt	$	4 12	4 12	4 12	4 12
Cost of hay at $8.90 per ton	$	1 87	1 87	1 87	1 87
Cost of turnips at $5.80 per ton	$	3 25	.....	2 44	2 84
Cost of silage at $5.16 per ton	$	.....	1 08	.....	.....
Total cost of feed	$	9 24	7 07	8 43	8 83
Cost of feed per 100 pounds milk	$	1 93	1 62	1 94	1 93
Cost of feed per 100 pounds fat	$	32 20	27 30	32 80	32 46

TURNIPS VS. SUNFLOWER SILAGE FOR MILK PRODUCTION—AVERAGE OF EIGHT FEEDING TRIALS

—		Turnips	Sunflower silage
Number of cows on test	No.	53	53
Total pounds milk produced in 7 days	lb.	6,988·3	6,330·7
Average pounds milk produced per day	"	18·84	17·06
Total pounds meal consumed	"	2,996	2,996
Total pounds hay consumed	"	5,698	5,698
Total pounds turnips consumed	"	10,570	.....
Total pounds silage consumed	"	.....	8,365
Pounds meal consumed per 100 pounds milk	"	42·87	47·32
Pounds turnips consumed per 100 pounds milk	"	151·25	.....
Pounds silage consumed per 100 pounds milk	"	.....	132·13
Total cost of feed	$	114 87	111 91
Cost of feed per 100 pounds milk	$	1 64	1 77

The results of this experiment in 1930 are contradictory to the averages given in the second table. The production of milk dropped when the change was made to sunflowers, but the cows would only consume 15 pounds of silage per day, compared with 35 to 40 pounds of roots. This extra cost for feed offset the decrease in production and made the cost per hundred weight of milk higher on the turnip ration.

The average results show turnips as producing the cheaper milk, although the difference is not great, 13 cents per 100 pounds.

Sunflower silage is not, as a rule, very palatable, but is a valuable succulent feed where roots or corn cannot be grown successfully. It is invariably a sure crop and for this reason has its place in a crop program.

FISH MEAL VERSUS OIL MEAL FOR FEEDING GROWING CALVES

This experiment has only been carried on for one season and no definite conclusions can be made, as yet.

Two groups of three calves each were selected as nearly the same age and breeding as possible. Both groups were fed the same quantities of all feeds, the only difference being in the meal ration, where fish meal replaced oil meal. The feed mixtures used were as follows:—

Feed	Fish meal group	Oil meal group
	lb.	lb.
Crushed oats	100	100
Bran	200	200
Middlings	100	100
Oil meal (36 per cent protein)	.....	50
Fish meal (70 per cent protein)	50	.....
Bone meal	5	5
Total protein.....per cent	18·21	18·33

The results of this experiment are given in the following table:—

Fish Meal versus Oil Meal for Feeding Growing Calves

—		Fish meal fed group	Oil meal fed group
Number of calves	No.	3	3
Initial weight—gross	lb.	525	505
Initial weight—average	"	175	168·3
Days on test	days	150	150
Final weight—gross	lb.	1,155	1,117
Final weight—average	"	385	372·3
Total gain	"	630	612
Average gain	"	210	204
Average daily gain	"	1·40	1·36
Whole milk fed at $1.40 per cwt	"	168	168
Skim-milk fed at $0.20 per cwt	"	4,360	4,360
Meal fed at $1.77 per cwt	"	437	.....
Meal fed at $1.72 per cwt	"	.....	437
Roots fed at $4.70 per ton	"	215	215
Ensilage fed at $4.20 per ton	"	867	867
Hay fed at $10 per ton	"	1,536	1,536
Total cost of feed	$	28 81	28 59
Average cost of feed	$	9 60	9 53
Cost of feed per head per day	cts.	6·40	6·35
Cost of feed per pound gain	"	4·57	4·67

Feeding Methods

The meal mixture fed to the milking cows for the greater part of the year was crushed oats, 100 pounds; bran, 300 pounds; middlings, 100 pounds; gluten feed, 50 pounds; cottonseed meal, 50 pounds; oil meal, 100 pounds; bone meal, 10 pounds. The dry stock received the same mixture as given to the "Oil meal group" in the calf feeding experiment reported above.

Pastures were excellent until August, when the dry season checked the growth severely. The quality of feed harvested was good and the yields heavy, excepting hay, which was slightly below average. Milk production was holding up well at the end of the year and several cows were starting off with the promise of making excellent records.

BEEF CATTLE

The work in this branch in 1930 consisted of experimental feeding tests with beef steers during the winter months.

At the end of the year there were forty steers on hand. These are being carried through the winter on a feeding test comparing the economy of heavy, medium and light meal feeding. This is a replication of the experiment conducted during 1927-28.

In 1929, twenty-three steers were purchased and after dehorning were divided into four lots, according to their live weight. Lot one was a group of five heavy steers, lots two and three medium steers, and lot four, light steers. Lot one received a maximum meal ration of 8 pounds per day; lot two, 10 pounds per day; lot three, 6 pounds, and lot four, 8 pounds.

Swedes were fed at the start of the test, then a gradual change made to sunflower silage, fed at the rate of 30 pounds per day; also a liberal ration of fair quality hay.

The results of this experiment are as follows:—

STEER FEEDING EXPERIMENT 1929-30—HEAVY VS. LIGHT STEERS—HEAVY VS. LIGHT MEAL FEEDING

Item		Lot 1 Heavy steers	Lot 2 Medium steers heavy fed	Lot 3 Medium steers light fed	Lot 4 light steers
Number of steers	No.	5	6	6	6
Initial gross weight, Dec. 5	lb.	5,110	4,950	5,015	4,730
Initial average weight, Dec. 5	"	1,022	825	836	788
Finished gross weight, April 24	"	6,590	6,950	6,680	6,420
Finished average weight, April 24	"	1,318	1,158	1,113	1,070
Total gain in 140 days	"	1,480	2,000	1,665	1,690
Average gain per head	"	296	333	278	282
Average daily gain per head	"	2·11	2·38	1·98	2·01
Total meal consumed at $41 per ton	"	4,950	7,062	4,698	5,940
Total roots consumed at $5.80 per ton	"	6,035	7,242	7,242	7,242
Total ensilage consumed at $5.16 per ton	"	20,020	24,024	24,024	24,024
Total hay consumed at $8.90 per ton	"	10,460	10,428	10,428	9,012
Total cost of feed	$	217 17	274 16	225 70	244 86
Cost of feed per pound gain	cts.	14·67	13·71	13·56	14·49
Meal consumed per head per day	lb.	7·07	8·41	5·59	7·07
Initial cost at $7·716 per cwt	$	394 29	381 94	386 96	364 97
Value per cwt. on April 24	$	9·499	9·354	9·354	9·50
Total value April 24	$	625 98	650 10	624 85	609 90
Value of spread plus gain	$	231 69	268 16	237 89	244 93
Gain or loss per lot	$	14 52	−6 00	12 19	0 07
Gain or loss per head	$	2 90	−1 00	2 03	0 01
Total dry matter consumed	lb.	18,344	21,174	19,047	18,933
Dry matter consumed per pound gain	"	12·39	10·59	11·44	11·20
Gain per 1,000 pounds live weight per 1,000 pounds dry matter consumed	"	15·79	19·08	17·43	18·87

The following table gives the average results from two feeding trials on the above experiment:—

RESULTS OF TWO TRIALS

Item		Lot 1. Heavy steers	Lot 2. Medium steers heavy fed	Lot 3. Medium steers light fed	Lot 4. light steers
Number of steers	No.	10	11	11	11
Average meal consumed per day	lb.	7·15	8·57	5·61	7·14
Average daily gain	"	2·25	2·22	1·85	2·05
Cost of feed per pound gain	cts.	13·98	15·16	14·76	14·58
Total cost at end of period	$	1,291 68	1,317 49	1,223 12	1,182 03
Total value at end of period	$	1,302 13	1,257 96	1,207 70	1,153 32
Profit or loss per lot	$	10 45	−59 53	−15 42	−28 71
Profit or loss per head	$	1 04	−5 41	−1 44	−2 61

Both years this test was conducted the spread between buying and selling prices was small, the price of feeders in the fall being high compared with the value of finished steers in the spring.

The results would indicate that 5 to 7 pounds of meal per day, or a maximum of 8 pounds, is the most economical practice. The heavy meal fed lots gave the greatest loss each year, while the heavy steers, fed a medium amount of meal, showed the most profit.

This experiment will be replicated again in order to obtain more data before definite conclusions can be made.

FINANCIAL STATEMENT, 1929-30

Debit

To 11,250 pounds at 7½ cents live weight	$	843 75
9,590 pounds at 7 cents live weight		671 30
Freight		13 14
Feed cost for 140 days		961 89
6 tons straw at $5		30 00
	$	2,520 08

Credit

By 23,227 pounds at 10 cents live weight	$	2,322 70
1,985 pounds at 9 cents live weight		178 65
96 tons manure at $2		192 00
	$	2,693 35
Credit balance	$	173 27

The 23 steers showed a credit balance sufficient to cover the labour charges and in addition a large quantity of roughage had been marketed through this channel and the manure retained on the farm, thus aiding in mantaining soil fertility.

DEHORNING STEERS

Twenty-eight steers were dehorned on October 28. The average weight on that date was 1,020 pounds. Three weeks later the average weight was 1,053, or a gain of 33 pounds per steer.

This compare favourably with the results obtained in previous years. There is very little danger of loss, providing the dehorners are disinfected and the horn cut close to the head. The benefits to be derived from this practice are many; the steers are more easily handled, are quieter in the feed lot and the loss from shipping is reduced to a minimum.

HORSES

There were twelve horses in stock on January 1, 1931, three pure-bred Clydesdales, eight grade draft horses and one driving mare.

Following are the data collected on the cost of maintaining work horses:

To:		
Feed for one horse during 1930—		
120 bushels oats at 60 cents per bushel	$	72 00
600 pounds bran at $29 per ton		8 70
450 pounds roots at $4.70 per ton		1 06
6,000 pounds hay at $10 per ton		30 00
	$	111 76
By:		
1,925 hours work at 10 cents per hour	$	192 50
Credit balance	$	80 74

COST OF MAINTENANCE OF DRAUGHT HORSES

Feed cost	$	111 76
Labour		40 00
Interest, $200 at 6 per cent		12 00
Shelter		18 00
Harness and repairs		8 97
Shoeing		8 22
Total yearly cost	$	198 95
Hours labour during the year		1,925
Cost per hour of labour	$	0·103

SWINE

On January 1, 1931, the swine herd consisted of ninety pure-bred Yorkshires, comprising two aged boars, thirteen sows and seventy-five feeders. One aged sow was disposed of and two young sows retained in the herd. The aged boar, Charlottetown Boy—114974—was sold and a three-year-old boar, Oak Lodge Quaestor—128098—purchased in his place. A young boar was also secured from the Experimental Station, Fredericton, out of an Advanced Registry sow.

Fifteen pigs were sold for breeding purposes, ten boars and five sows. Thirty-two feeders were sold and one hundred and thirty-three hogs were finished for market; eighty-four or 63·2 per cent of these graded select and eleven were butcher hogs.

Eleven sows in the herd farrowed nineteen litters in 1930, with a total of 259 pigs, raising 192 or 10·1 pigs per litter. The following table gives the data collected on these litters during 1930:—

PERFORMANCE OF LITTERS

Number of sows	Average meal consumed per day	Cost of feed per sow for year	Number of litters farrowed	Average number of pigs per litter	Average number raised to six weeks	Average per cent raised	Average cost per pig at six weeks	Average value at six weeks
	lb.	$				%	$	$
11	5·75	46 19	19	13·63	10·1	74·1	2 65	6 16

Had all pigs been sold at six weeks of age, the following returns would have been realized:—

Average value per pig at 6 weeks	$ 6 16
Average profit per pig over feed cost	3 51
Number of pigs raised per sow in the year	17 45
Average profit per sow over feed cost	61 25
Total profit on eleven sows	673 75

FINANCIAL STATEMENT OF SWINE HERD, 1930—11 SOWS, 1 BOAR AND PROGENY

Debit

47,562 pounds crushed oats at $35 per ton	$ 832 32
6,935 pounds middlings at $35.80 per ton	124 14
22,895 pounds shorts at $30.80 per ton	352 58
10,754 pounds bran at $29 per ton	155 93
34,344 pounds barley at $30 per ton	515 16
1,628 pounds oil meal at $48 per ton	39 07
2,054 pounds corn meal at $36 per ton	36 97
900 pounds feed flour at $30 per ton	13 50
4,148 pounds fish meal at $90 per ton	186 66
73,179 pounds skim milk at $4 per ton	146 36
2,730 pounds minerals at $20 per ton	27 30
412 pounds charcoal at $40 per ton	8 24
155 pounds bone meal at $80 per ton	6 20
32,624 pounds roots at $4.70 per ton	76 67
12,950 pounds potatoes at $6 per ton	38 85
7,232 pounds greenfeed at $4 per ton	14 46
6,959 pounds apples at $3 per ton	10 44
41 months pasture at 50 cents per month	20 50
15 tons straw at $5 per ton	75 00
	$ 2,680 35

Credit

By sale of pork (live weight prices)—	
420 pounds at 6 cents	$ 25 20
445 pounds at 9·50 cents	42 27
2,150 pounds at 9·75 cents	209 62
2,410 pounds at 10·40 cents	250 64
2,200 pounds at 10·60 cents	233 20
276 pounds at 11·00 cents	30 36
11,350 pounds at 11·25 cents	1,276 87
2,080 pounds at 12·00 cents	249 60
2,290 pounds at 12·75 cents	291 97

Credit—Concluded

By sale of pork (live weight prices)—*Concluded*	
3,200 pounds at 13·00 cents	416 00
Premium on selects	84 00
6 registered pigs at $10	60 00
5 unregistered boars at $8	40 00
28 feeders at $6	168 00
4 gilts at $20	80 00
2 feeders at $7	14 00
75 feeders on hand at $6	450 00
100 tons manure at $2	200 00
	$ 4,121 73
Less selling commission and deductions for butcher hogs	36 00
	$ 4,085 73
Labour and investment returns	$ 1,405 38

FINANCIAL STATEMENT FOR EIGHT-YEAR PERIOD 1923-30, INCLUSIVE

Year	Debit	Credit	Labour and investment returns
	$	$	$
1923	1,243 08	2,314 10	1,071 02
1924	2,044 23	2,687 23	643 00
1925	2,607 11	3,702 42	1,095 31
1926	2,136 94	2,758 13	621 19
1927	1,526 37	1,908 75	382 38
1928	2,345 37	2,622 75	277 38
1929	2,234 81	3,319 47	1,084 66
1930	2,680 35	4,085 73	1,405 38
Average	2,102 28	2,924 82	822 54

Cost of raising pigs to six weeks of age and cost of pork production (labour and investment neglected):—

To: Feed for 11 sows	$ 508 10
19 boar services at $1	19 00
3½ tons straw at $5	17 50
	$ 544 60
Less 10 tons manure at $2	20 00
Total cost to raise 192 pigs to 6 weeks of age	$ 524 60
Cost to raise 1 pig to 6 weeks of age	2 73
To Cost of 133 pigs at 6 weeks of age	$ 363 09
Feed cost of 133 pigs to finishing	1,928 50
9 tons straw at $5	45 00
	$ 2,336 59
By 35 tons manure at $2	70 00
Total cost to produce 25,680 pounds pork	$ 2,266 59
Total cost to produce 1 pound of pork	8·83 cents

Sales of bacon hogs were made from this Farm during the months of March, May, June, October, November and December. The top price received was $13 per hundred pounds in March and the lowest price was $9.75 in December, with an average for the year of $11.71, compared with $12.30 in 1929, $10.12 in 1928 and $9.50 in 1927.

The spread between cost and selling prices was $2.88 as compared with the average for the past eight years of $1.94. The low feed costs at the end of the year did not materially change the cost of production for 1930, but will undoubtedly show its effect in 1931 and even should lower market prices prevail for pork during this year, the spread should continue encouraging.

The following table gives the eight-year average feed cost of raising pigs to six weeks of age and the average market prices received by this Farm:—

EIGHT-YEAR AVERAGE FEED COST OF RAISING PIGS TO SIX WEEKS

Year	Cost to raise pigs to six weeks of age	Cost of production per cwt. live weight of pork	Average market price received per cwt. live weight
	$	$	$
1923	2 93	6 87	9 64
1924	3 99	9 10	8 41
1925	3 87	9 71	11 53
1926	4 99	9 20	12 80
1927	3 16	8 64	9 50
1928	3 90	9 43	10 12
1929	2 51	8 73	12 30
1930	2 73	8 83	11 71
Average—8 years	3 51	8 81	10 75

FEEDING METHODS

The methods of feeding followed in 1930 were similar to those outlined in the 1929 report. The brood sows were fed a mixture of crushed oats, 200 pounds; shorts, 200 pounds and bran, 100 pounds. When skim milk was not available, fish meal was added at the rate of 4 pounds per 100 pounds of grain mixture.

The feeders received a mixture of equal parts of either sifted crushed oats or crushed hulless oats and flour middlings, until eight to ten weeks of age; then were carried on rations similar to the following:—

—	First sixty days	Sixty to ninety days	Ninety days to finish
	lb.	lb.	lb.
Middlings	200	100	.....
Crushed oats	175	200	150
Crushed barley	50	150	200
Corn meal	50	50	100
Shorts	50	50	100
Bran	25	.....	.....
Oil meal	18	18	18
Bone char	6	6	6
Salt	3	3	3

Skim-milk is supplied throughout the period except to experimental pens on other animal protein supplements. When the former is not available, fish meal is fed at the rate of 4 to 8 pounds per 100 pounds of meal fed.

EXPERIMENTAL FEEDING

Three experiments were conducted during 1930. These were comparisons of fish meal and skim-milk as sources of animal protein for bacon hogs. Table 1 contains the data collected on four pens during the winter of 1929-30. This was a comparison of fish meal and skim-milk from weaning to finish and also a comparison of a lot having outside run with one closely confined. One hog in pen 1 crippled and died. The data presented are on the five remaining hogs. Over a period of years it has been observed that there has been less crippling among the lots receiving fish meal than among those receiving skim-milk, even where a mineral mixture is supplied.

The fish meal fed hogs have as a rule shown more uniformity than those fed skim-milk and have been equal to, if not slightly superior, in bacon type.

Tables 2 and 3 present the data collected during the summer of 1930 on eight pens of hogs. Lack of feeding space prevented carrying those reported in Table 3 longer than two months, but the information obtained is deemed of importance in showing the value of animal protein in the ration.

TABLE 1—FISH MEAL VS. SKIM-MILK, WINTER, 1929-30

Item		Skim-milk, weaning to finish—outside run	Fish meal weaning to finish—outside run	Check—outside run	Fish meal weaning to finish—inside
Hogs in test	No.	5	6	5	5
Initial weight—gross	lb.	220	276	227	190
Initial weight—average	"	44	46	45·4	38
Days on test	days	129	129	129	129
Final weight—gross	lb.	773	1,010	699	766
Final weight—average	"	154·6	168·3	139·8	153·2
Total gain	"	553	734	472	576
Average gain per hog	"	110·6	122·3	94·4	115·2
Average daily gain per hog	"	0·86	0·95	0·73	0·89
Meal consumed	"	2,472	2,956	2,472	2,472
Roots consumed	"	526	752	526	526
Skim-milk consumed	"	3,190	.....	.....	.....
Fish meal consumed	"	.....	236	.....	198
Minerals consumed	"	125	142	125	125
Meal consumed per pound gain	"	4·47	4·03	5·24	4·29
Cost of feed	$	64 03	79 84	57 65	66 56
Cost of feed per hog	$	12 81	13 31	11 53	13 31
Cost of feed per hog per day	cts.	9·93	10·32	8·94	10·32
Cost of feed per pound gain	"	11·58	10·88	12·21	11·56

Feed Prices—

Meal	$ 2 22 per cwt.
Roots	5 80 per ton
Skim-milk	4 00 "
Fish meal	90 00 "
Minerals	20 00 "

TABLE 2—FISH MEAL VERSUS SKIM-MILK—SUMMER, 1930

Item		Skim-milk weaning to finish	Skim-milk to three months; then fish meal to finish	Skim-milk to three months; then fish meal after four months to finish	Skim-milk to three months; then grain alone
Hogs in test	No.	5	5	5	5
Initial weight—gross	lb.	100	99	88	99
Initial weight—average	"	20	19·8	17·6	19·8
Days on test	days	118	118	118	118
Final weight—gross	lb.	771	732	684	665
Final weight—average	"	154·2	146·4	136·8	133
Total gain	"	671	633	596	566
Average gain per hog	"	134·2	126·6	119·2	113·2
Average daily gain per hog	"	1·14	1·07	1·01	0·96
Meal consumed	"	2,285	2,285	2,285	2,285
Green feed consumed	"	639	639	639	639
Skim-milk consumed	"	2,603	956	956	956
Fish meal consumed	"	.....	144	98	.....
Minerals consumed	"	30	30	30	30
Meal consumed per pound gain	"	3·41	3·61	3·83	4·04
Cost of feed	$	50 88	54 07	52 00	47 59
Cost of feed per hog	$	10 18	10 81	10 40	9 52
Cost of feed per hog per day	cts.	8·63	9·16	8·81	8·07
Cost of feed per pound gain	"	7·58	8·54	8·72	8·41

Feed Prices—

Meal	$38 60 per ton
Green feed	4 00 "
Fish meal	90 00 "
Minerals	20 00 "
Skim-milk	4 00 "

TABLE 3—FISH MEAL VERSUS SKIM-MILK—SUMMER, 1930

Item		Skim-milk weaning to finish	Fish meal 8 per cent weaning to finish	Check	Fish meal 4 per cent weaning to finish
Hogs in test	No.	6	6	5	5
Initial weight—gross	lb.	109	119	111	111
Initial weight—average	"	18·2	19·8	22·2	22·2
Days on test	days	61	61	61	61
Final weight—gross	lb.	399	372	252	285
Final weight—average	"	66·5	62	50·4	57
Total gain	"	290	253	141	174
Average gain per hog	"	48·3	42·2	28·2	34·8
Average daily gain per hog	"	0·79	0·69	0·46	0·57
Meal consumed	"	847	847	567	567
Green feed consumed	"	217	217	212	212
Skim-milk consumed	"	1,384	.....	.....	.....
Fish meal consumed	"	.....	68	.....	23
Minerals consumed	"	22	22	20	20
Meal consumed per pound gain	"	2·92	3·35	4·02	3·26
Cost of feed	$	19 77	20 06	11 57	12 60
Cost of feed per hog	$	3 30	3 34	2 31	2 52
Cost of feed per hog per day	cts.	5·40	5·48	3·79	4·13
Cost of feed per pound gain	"	6·82	7·93	8·21	7·24

Feed prices—

Meal	$38 60 per ton
Green feed	4 00 "
Fish meal	90 00 "
Minerals	20 00 "
Skim-milk	4 00 "

Experiments have been conducted during the past few years along similar lines to the above. Tables 4 and 5 give the data obtained from these experiments. Other tests are being carried on, but sufficient information is not yet available to warrant its publication.

TABLE 4—FISH MEAL VERSUS SKIM-MILK—AVERAGE OF FOUR FEEDING TRIALS, 1927-30

Item		Skim-milk weaning to finish	Skim-milk to three months; then fish meal to finish	Skim-milk to three months: fish meal after four months	Skim-milk to three months: then grain alone
Total hogs in test	No.	20	20	20	20
Initial weight gross	lb.	630	735	723	670
Initial weight—average	"	31·5	36·75	36·15	33·5
Days on test (average)	days	144	144	144	152·5
Final weight—gross	lb.	3,582	3,612	3,573	3,329
Final weight—average	"	179·1	180·6	178·65	166·45
Total gain	"	2,952	2,877	2,850	2,659
Average gain per hog	"	147·6	143·85	142·5	132·95
Average daily gain per hog	"	1·025	0·999	0·990	0·872
Meal consumed	"	10,107	10,568	10,568	11,151
Greenfeed consumed	"	2,919	2,919	2,919	3,385
Skim-milk consumed	"	15,781	2,406	2,406	2,501
Fish meal consumed	"	.....	764	630	.....
Minerals consumed	"	30	30	30	30
Meal consumed per pound gain	"	3·42	3·67	3·71	4·19
Total cost of feed	$	251 91	254 86	250 91	247 69
Cost of feed per hog	$	12 60	12 74	12 55	12 38
Cost of feed per hog per day	cts.	8·75	8·85	8·71	8·12
Cost of feed per pound gain	"	8·53	8·86	8·80	9·32

NOTE.—Fish meal was fed at the rate of 8 per cent of the meal ration.

TABLE 5—FISH MEAL VERSUS SKIM-MILK WEANING TO FINISH—AVERAGE OF THREE FEEDING TRIALS 1928-1930

Item		Fish meal, weaning to finish	Skim-milk, weaning to finish
Total hogs in test	No.	21	21
Initial weight—gross	lb.	609	557
Initial weight—average	"	29	27·85
Days on test—average	days	148	148
Final weight—gross	lb.	3,843	3,686
Final weight—average	"	183	184·3
Total gain	"	3,234	3,129
Average gain per hog	"	154	156·45
Average daily gain per hog	"	1·04	1·06
Meal consumed	"	10,945	10,461
Green feed consumed	"	3,235	3,009
Skim-milk consumed	"	.....	14,700
Fish meal consumed	"	859	.....
Minerals consumed	"	142	125
Meal consumed per pound gain	"	3·38	3·34
Total cost of feed	$	293 32	275 46
Cost of feed per hog	$	13 97	13 77
Cost of feed per hog per day	cts.	9·44	9·31
Cost of feed per pound gain	"	9·07	8·80

Summary of results to date:—

1. Fish meal has proven to be a valuable substitute for skim-milk for bacon hog production.

2. There is no significant difference shown in the average gains of lots of hogs fed either of these feeds, but invariably check lots (receiving no animal protein) have made lower gains.

3. The high price of fish meal to date has increased the cost per pound gain, but where a good quality product (60 to 70 per cent protein and a low oil content), can be obtained at moderate cost, it may be used profitably as a source of animal protein in the ration.

4. Analyzing the data given in Table 5, we find that, comparing lot 1 with lot 4, 13,280 pounds of skim-milk gave an increase in gain of 293 pounds. With pork at 10 cents per pound, this gives skim-milk a value of 22 cents per hundred pounds. Comparing lot 2 with lot 4, 764 pounds of fish meal gave an increase in gain of 218 pounds, or a value for fish meal of $2.85 per hundred pounds. Lot 3 compared with lot 4 shows 630 pounds of fish meal giving 191 pounds gain, giving it a value of $3.03 per hundred pounds on the same basis.

Experiments are now under way to determine whether a smaller amount of fish meal than 8 per cent of the meal ration will give more economical results.

ADVANCED REGISTRY OF SWINE

Nine sows were entered in the Advanced Registry for Swine in 1930. Complete information on the slaughter test is not yet available. This work is being followed up and eventually all sows that will not qualify in this test will be discarded. A full outline of this work was given in the report from this Farm for 1929.

SHEEP

The flock of pure-bred Shropshires numbered sixty-three head on January 1, 1931. It comprised twenty-six aged ewes, eleven shearling ewes, twenty-two ewe lambs, one aged ram, one shearling ram and two ram lambs, an increase of thirteen head over the previous year.

We were fortunate in securing a XXX shearling ram to mate with the daughters of Stewart 132—60513—. These rams are both of "Buttar" breeding

along similar lines. The pedigrees given below show their relationship and the system of breeding we are now following:—

AGED RAM—

Stewart 132 —60513
- Buttar's Papillon —38602
  - Buttar 443 —38871
  - Stewart 86 —36445
- Stewart 109 —45819
  - Buttar 443 —38871
  - Chisholm 214 —46701

SHEARLING RAM—

Chisholm 353 —70330
- Hanmer H1229 —58923
  - Buttar's Papillon —38602
  - Chisholm 116 —36371
- Chisholm 235 —57003
  - Buttar 443 —38871
  - Chisholm 214 —46701

The demand for breeding stock, especially rams, was good in 1930. Eight graded rams (six XXX and two XX), six ewe lambs and two aged ewes were sold for breeding purposes. During the past five years 48 pure-bred Shropshire rams and 24 ewes have gone out to breeding centres from this flock. Five aged ewes, having reached the limit of their usefulness, were discarded.

In 1930 thirty-three breeding ewes dropped 49 lambs, raising 46, or 1·394 lambs per ewe. The average raised for the past five years was 1·476 lambs per ewe and for the eleven year period, 1920 to 1930 inclusive, 1·345 lambs per ewe.

The wool clip in 1930 averaged as follows:—breeding ewes, 7·73 pounds; shearling ewes, 6·45 pounds; shearling rams, 7·5 pounds; and aged ram, 8 pounds. This product was marketed through the Canadian Co-operative

Typey shropshire ewes, 1930 crop

Wool Growers' Association. Since 1928 we have adopted the policy of procuring from this Associat on the grading of each fleece. This aids materially at time of culling, for it is a real advantage to know the individual animal producing a poor quality fleece.

Of the seven rams graded during the fall of 1930, five graded XXX.

The following table presents the data collected during the past five years on birth, weight and gain for the first month, for male and female lambs; also singles, twins and triplets:—

LAMBS—BIRTH WEIGHT AND GAIN FOR THE FIRST MONTH—5-YEAR AVERAGE

—	Number of lambs	Birth weight, average	Gain for the first month, average
	No.	lb.	lb.
Females, 1930	29	8·43	18·59
5-year average	120	7·55	15·23
Males, 1930	17	8·57	16·00
5-year average	111	7·96	16·40
Singles, 1930	16	8·75	20·53
5-year average	63	8·71	19·15
Twins, 1930	30	8·42	16·65
5-year average	150	7·61	16·47
Triplets, 1930			
5-year average	18	5·62	13·69
Average for all lambs, 1930	46	8·48	17·63
5-year average	231	7·75	15·79

MANAGEMENT OF FLOCK

The management of the flock during the year was very similar to that outlined in the 1929 report.

The grain ration used in the fall was crushed oats, 200 pounds; bran, 100 pounds; oil meal, 25 pounds; and cracked corn, 25 pounds. In the spring the same ration except corn is fed. Rock salt is supplied at all times. The flock was dipped spring and fall in Cooper's Dip. No external parasites have been found in the flock for several years.

Almost complete control of internal parasites has been accomplished by the use of Nema (tetrachlorethylene) capsules. The flock is treated spring and fall and this, with a frequent change of pastures, has proven to be a sound practice.

FINANCIAL STATEMENT OF FLOCK, 1930

Debit

To Feed for 33 breeding ewes and ram:—			
4,573 pounds meal at $35 per ton	$ 80 03		
15,942 pounds roots at $4.70 per ton	37 46		
14,787 pounds hay at $10 per ton	73 93		
5,511 days pasture at 2 cents per day	110 22		
		$ 301 64	
To Feed for 11 yearling ewes:—			
442 pounds meal at $35 per ton	$ 7 73		
6,303 pounds roots at $4.70 per ton	14 81		
5,780 pounds hay at $10 per ton	28 90		
1,837 days pasture at 2 cents per day	36 74		
		$ 88 18	
To Feed for 2 yearling rams:—			
56 pounds meal at $35 per ton	$ 0 98		
780 pounds roots at $4.70 per ton	1 83		
746 pounds hay at $10 per ton	3 73		
316 days pasture at 2 cents per day	6 32		
		$ 12 86	
To Feed for 46 lambs:—			
1,458 pounds meal at $35 per ton	$ 25 51		
3,192 pounds roots at $4.70 per ton	7 50		
3,192 pounds hay at $10 per ton	15 96		
7,483 days pasture at 1 cent per day	74 83		
		123 80	
Total cost of feed		$ 526 48	
To Loss of 2 ewes at $15	$ 30 00		
Loss of 1 ewe lamb at $10	10 00		
Purchase of 1 ram at $35	35 00		
		75 00	
		$ 601 48	

Credit

By sale of:—		
361 pounds wool at 12·89 cents	$ 46 53	
136 pounds lamb at 25 cents (dressed weight)	34 00	
134 pounds lamb at 20 cents (dressed weight)	26 80	
125 pounds mutton at 9 cents (dressed weight)	11 25	
390 pounds mutton at 4 cents (live weight)	15 60	
2 aged ewes at $10	20 00	
3 ewe lambs at $14	42 00	
3 ewe lambs at $8	24 00	
2 XXX shearling rams at $35	70 00	
2 XXX ram lambs at $30	60 00	
2 XXX ram lambs at $25	50 00	
1 XX ram lamb at $20	20 00	
1 XX ram lamb at $18	18 00	
2 ungraded ram lambs in stock at $20	40 00	
35 tons manure at $2 per ton	70 00	
Increased stock 22 ewe lambs at $15	330 00	
		$ 878 18
Labour and investment returns	$ 276 70	
Cost of maintaining a pure-bred flock—		
Total feed cost for 44 ewes and ram	$ 389 82	
Average feed cost per head	8 86	
Cost to raise pure-bred lambs—		
To feed cost for 33 ewes and ram	$ 301 64	
To feed cost for 46 lambs	123 80	
		425 44
By 255 pounds wool at 12·89 cents	$ 32 87	
By 27 tons manure at $2 per ton	54 00	
		86 87
Total cost for 46 lambs		$ 338 57
Average cost for 1 lamb		7 36
Value of wintering pure-bred ram lambs—		
To value of 2 lambs 1929	$ 48 00	
Feed cost to date of sale, 1930	12 86	
		$ 60 86
By sale of 2 shearling rams	$ 70 00	
15 pounds wool at 12·89 cents	1 93	
½ ton manure at $2	1 00	
		72 93
Credit balance		$ 12 07
Average per ram		6 03

SUMMARY OF ABOVE DATA, COVERING THE 11-YEAR PERIOD 1920 TO 1930 INCLUSIVE

Year	Cost of maintaining breeding ewes	Cost of raising lambs	Returns from wintering ram lambs	Credit balance from flock
	$	$	$	$
1920	11 95	6 33	.....	19 55*
1921	7 54	4 88	.....	283 14
1922	6 30	4 07	.....	194 58
1923	5 81	3 13	.....	224 87
1924	7 07	4 51	.....	221 52
1925	6 85	4 95	.....	208 23
1926	11 18	6 24	.....	236 10
1927	8 97	6 77	5 72	452 42
1928	11 19	6 91	12 48	410 49
1929	8 47	5 76	8 65	407 52
1930	8 86	7 36	6 03	276 67
Average	8 56	5 54	8 22	265 91
Average, 1926-30	9 73	6 61	.....	356 64

*An error in the "Credit Balance" for 1920 changes this from a deficit of $37.34 as given in the 1929 report to a surplus as shown above.

FIELD HUSBANDRY

THE SEASON

The growing season of 1930 was one of the best on record at this Farm. All crops, except hay and pasturage, were above average in yield and quality. The clover hay crop was greatly reduced by severe winter-killing. Pastures were excellent until August, then became parched from continuous dry weather. The sunshine records show the largest number of hours ever recorded in any one year at this Farm. During the growing season, from April to September, inclusive, there were 1,327·2 hours, or an average of 8·7 hours per day. From May 29 to September 14, the sun shone every day except on August 10, or only one break in 108 days. The rainfall during the growing season was 12·64 inches, compared with the 23-year average of 17·28 inches.

Seeding started three weeks earlier than usual. The first seeding of Banner oats was on May 1. The frost-free period was 132 days, equalling the record set in 1928. Germination was slow but growth during June and July was very rapid. Harvesting started on the main fields on August 24.

Fall ploughing was delayed by the dry weather, but was completed before the freeze-up on November 29.

RRECIPITATION AND SUNSHINE RECORDS, 1928, 1929 AND 1930, DURING THE GROWING SEASON

Month	Precipitation			Average 23 years	Sunshine			Average 19 years
	1928	1929	1930		1928	1929	1930	
	in.	in.	in.	in.	hours	hours	hours	hours
April	2·82	1·95	0·97	2·68	177·4	141·0	172·7	139·7
May	2·38	4·29	1·86	2·36	168·3	187·5	218·1	181·7
June	2·08	1·00	1·76	2·80	207·5	215·6	261·6	211·0
July	2·78	2·59	3·44	3·08	254·6	262·7	238·3	219·8
August	1·92	1·12	2·26	3·35	167·4	213·6	255·5	212·7
September	5·59	3·90	2·35	3·01	171·2	148·4	181·0	163·9
Total	17·57	14·85	12·64	17·28	1,146·4	1,168·8	1,327·2	1,128·8

NOTE.—In 1930, from May 29 to September 14, the sun shone every day except August 10, or only one break in 108 days.

CULTURAL EXPERIMENTS

The cultural work as outlined in the 1929 report from this Farm was continued during 1930. A summary of the results was given in that report, and is not changed to any extent by the data collected in 1930. The results to date of the more important experiments are given in the following tables:—

PREPARATION OF SOD LAND FOR GRAIN (OATS)

Plot No.	Treatment	Yield per acre, 8-year average	
		Grain	Straw
		bush.	tons
1	Plough 6 inches deep early in August, disk remainder of season	46·41	0·914
2	Plough 6 inches deep early in August, disk and rib	50·30	1·135
3	Same as plot 1	48·23	1·155
4	Plough 6 inches deep in September, disk remainder of season	48·02	1·196
5	Plough 6 inches deep in October, disk remainder of season	47·13	1·084
6	Plough 6 inches deep in October, no top working	46·32	1·108
7	Plough shallow in August, top work, replough late in autumn	47·86	0·982
8	Plough 6 inches deep in spring	45·51	1·061
9	Same as plot 1	42·79	0·98

The results do not indicate any real significant difference between the various treatments. They do indicate that early fall ploughing, with top-working, is the most economical procedure to follow. The increase in yield on the ribbed plots is not sufficient, as yet, to offset the extra labour charges.

Banner oats in a four-year rotation yielding an average of 57 bushels per acre, produced at a cost of 41·2 cents

After-harvest Cultivation of Sunflower Ground for Grain

Plot No.	Treatment	Yield per acre, 8-year average	
		Grain	Straw
		bush.	tons
1	Plough shallow in spring	59·12	1·415
2	No autumn treatment, disk in spring	61·10	1·449
3	Plough shallow in autumn	56·26	1·371
4	Plough shallow in spring	56·47	1·383
5	Rib in autumn	57·21	1·385
6	Plough shallow in spring	55·07	1·386

In addition to being the cheapest treatment, the disking in the spring has given the highest average yield to date. This treatment following swedes and potatoes on larger fields at this Farm has given good results. The advantages are:—one less ploughing in a rotation, fewer weeds in the grain and higher yields, all of which aid in lowering the unit cost.

PREPARATION OF SOD LAND FOR SUNFLOWERS AND SWEDES

Plot No.	Treatment	Yield per acre, 8-year average	
		Sunflowers	Swedes
		tons	tons
1	Manure in summer, plough in August, top work	16·463	17·552
2	Manure in summer, plough in August, top work, replough in spring	16·795	15·507
3	Manure and plough late in fall	15·275	15·392
4	Manure in winter or spring, spring plough	15·118	12·027
5	Same as plot 2	16·369	16·472

This experiment shows the value of fall ploughing for hoed crops, such as sunflowers and roots. The former has given a slight increase in yield, following the two ploughings, but not sufficient to warrant its recommendation. Swedes show the highest yield following the single summer ploughing.

RATE OF SEEDING A NURSE CROP OF OATS

Plot No.	Treatment	Yield per acre, 8-year average	
		Grain	Straw
		bush.	tons
1	Seeded at the rate of 2 bushels per acre	43·40	1·032
2	Seeded at the rate of 2¾ bushels per acre	40·51	1·029
3	Seeded at the rate of 3½ bushels per acre	44·32	0·922
4	Seeded at the rate of 2¾ bushels per acre	45·18	0·993

YIELD OF CLOVER FOLLOWING OATS

Plot No.	Treatment	8-year average
		tons
1	Following 2 bushels seeding of oats	1·748
2	Following 2¾ bushels seeding of oats	1·602
3	Following 3½ bushels seeding of oats	1·598
4	Following 2¾ bushels seeding of oats	1·675

YIELD OF TIMOTHY FOLLOWING CLOVER

Plot No.	Treatment	8-year average
		tons
1	Following 2 bushels seeding of oats	1·911
2	Following 2¾ bushels seeding of oats	1·667
3	Following 3½ bushels seeding of oats	1·610
4	Following 2¾ bushels seeding of oats	1,740

The results of this experiment would indicate that the lighter seeding of oats permits the clover and timothy to make a better start, resulting in higher yields of these two crops.

DISTANCE BETWEEN ROWS OF SUNFLOWERS

This project, started in 1921, was carried on for ten consecutive years. The consistency of the data collected from year to year, on this project, justifies its conclusion and reasonably definite deductions being drawn from the average results.

Three series of plots were carried on each year, comparing 2·5, 3 and 3·5 foot rows. Yields were recorded and notes taken on the quality of crops harvested from each series. The results for each year and the average yields are given in the following table:—

SUNFLOWERS—RESULTS FROM DIFFERENT DISTANCES BETWEEN ROWS

Year	Yield per acre		
	2·5-foot row	3-foot row	3·5-foot row
	tons	tons	tons
1921	18·10	20·30	20·00
1922	23·10	21·60	24·60
1923	25·30	30·20	24·10
1924	23·40	19·26	18·44
1925	27·00	24·36	27·08
1926	13·40	15·06	13·69
1927	17·48	14·79	15·69
1928	26·11	22·16	21·98
1929	14·85	15·26	14·00
1930	8·60	11·40	11·35
Average, 10 years	19·73	19·43	19·09

The slight variation in average yield is not significant. The greatest difference was noted in the quality of crop for silage. The closer plantings produced a leafier plant, with a finer stem, resulting in a silage of superior quality and more palatable than the coarser growth produced on the wide rows. The difference in yield and quality of crop produced on the 2·5- and 3-foot rows was not significant. The 3-foot row is recommended, therefore, on account of greater ease in cultivation, which is a real factor on weedy or lumpy soil.

DATES OF SEEDING SUNFLOWERS

This project, also started in 1921, was carried on for ten years. The yields recorded from year to year are, in the main, consistent and justify the conclusion of the project, with general recommendations.

A series of plots, seeded at intervals of one week, were carried on, and the yields recorded. These are given in the following table for each year and also the average yields for the years tested. At the foot of the table, the yields are given on a percentage basis, using the first seeding as 100 per cent.

RESULTS FROM DIFFERENT DATES OF SEEDING SUNFLOWERS

Year	First seeding	Second seeding	Third seeding	Fourth seeding
	tons	tons	tons	tons
1921	19·20	17·44	16·56	.....
1922	30·90	33·00	37·20	30·30
1923	30·90	22·30	31·90	30·90
1924	26·83	30·90	20·50	18·50
1925	28·83	19·67	.....	12·50
1926	15·56	17·45	13·92	.....
1927	15·24	11·76	8·29	8·29
1928	27·15	24·80	14·90	.....
1929	18·67	14·92	14·00	8·50
1930	17·25	15·81	13·31	.....
Average	23·05	20·81	18·95	18·17
Average yield on a percentage basis	100·00	90·28	84·56	72·05

The consistent superiority of the first and second seedings over the third and fourth justifies the conclusion that early seeding will, in the majority of cases, give the highest yields. It is recommended, therefore, that sunflowers be seeded as early in the spring as the land can be properly prepared.

ROTATIONS

The rotations outlined in the 1929 report from this Farm were continued. The five-year rotation of oats, hoed crops, oats seeded, clover, timothy, again showed the greatest returns per acre and is a good rotation to follow under average farm conditions. The application of manure should be twenty tons during the rotation. It may all be applied to the hoed crop, or where land is in fair tilth two-thirds may be applied to the hoed crop and one-third used as a top-dressing on the clover sod.

COST OF PRODUCTION OF FARM CROPS

These studies were carried on in 1930 as in former years. The data collected were based on the following cost and return values:—

Cost Values

Rent and taxes per acre	$ 4 00
Manure per ton	1 50
Machinery per acre	2 85
Machinery per acre (silage crops)	5 85
Seed—	
Wheat, per bushel	2 25
Oats, per bushel	1 25
Barley, per bushel	1 50
Sunflowers, per pound	0 095
Corn, per pound	0 04
Timothy, per pound	0 105
Red clover, per pound	0 19
Alsike, per pound	0 165
Alfalfa, per pound	0 465
Swedes, per pound	0 85
Manual labour, per hour	0 30
Horse labour, per hour	0 10
Tractor labour, per hour	0 60
Teamster labour, per hour	0 34
Tractor operator, per hour	0 45
Threshing oats, per bushel	0 04
Threshing wheat, per bushel	0 07
Threshing barley, per bushel	0 05
Threshing mixed grain, per bushel	0 05
Twine, per pound	0 16

Return Values

Hay, per ton	$ 11 00
Oat and barley straw, per ton	4 00
Wheat straw, per ton	2 00
Swedes, per ton	2 20
Sunflower silage, per ton	2 50
Corn silage, per ton	2 50
Oat and pea silage, per ton	3 40
Oats, per bushel	0 50
Wheat, per bushel	1 00
Barley, per bushel	0 60
Mixed grain, per bushel	0 70

The cost of growing the various farm crops for 1930 and the average for nine years is given in the following tables:—

Items of expense		Oats	Huron wheat	Garnet wheat	Mixed grain	Barley	Corn silage	Sunflower silage	Oats and pea silage	Swede turnips	Hay, first year	Hay, second year
Rent and taxes	$	4 00	4 00	4 00	4 00	4 00	4 00	4 00	4 00	4 00	4 00	4 00
Manure	$	9 00	9 00	9 00	9 00	9 00	12 00	12 00	12 00	15 29	6 00	3 00
Seed	$	3 75	4 50	4 50	4 44	3 75	1 00	1 43	6 10	1 70	1 80	2 00
Machinery	$	2 85	2 85	2 85	2 85	2 85	5 85	5 85	5 85	2 85	2 85	2 85
Twine	$	0 56	0 48	0 48	0 56	0 42	0 48	0 48	0 64	.....	.....	.....
Manual labour	$	3 11	2 84	3 07	3 20	3 02	18 22	18 24	9 05	46 76	3 94	5 23
Horse labour	$	0 91	0 87	0 92	1 00	1 00	3 34	4 60	1 10	3 32	0 62	0 84
Tractor labour	$	0 60	0 60	0 60	0 60	0 60	4 65	3 90	3 90	4 20	.....	.....
Threshing	$	2 31	1 71	1 72	1 98	1 95	.....	.....	.....	.....	.....	.....
Total cost per acre	$	27 09	26 85	27 14	27 63	26 59	49 54	50 50	42 64	78 12	19 21	17 92
Yield per acre	bush.	57·73	24·37	24·58	39·67	*38·95	tons 6·079	tons15·835	tons 7·788	tons 21·39	tons 1·433	tons 2·078
Yield per acre, straw	tons	0·86	0·599	0·695	0·682	0·703	.....	.....	.....	.....	.....	.....
Value per acre	$	28 86	24 37	24 58	27 67	23 37	40 20	39 59	26 48	47 06	15 76	22 86
Value per acre, straw	$	3 44	1 20	1 39	2 73	2 81	.....	.....	.....	.....	.....	.....
Total value per acre	$	32 30	25 57	25 97	30 40	26 18	40 20	39 59	26 48	47 06	15 76	22 86
Profit or loss per acre	$	5 21	−1 28	−1 17	2 77	−0 41	−9 34	−10 91	−16 16	−31 6	−3 45	4 94
Cost per ton or bushel—considering value of straw	cts.	41·9	$1 05	$1 05	63·4	61·0	$3 08	$3 19	$5 48	$3 65	$13 41	$8 62

*45 pounds per bushel.

COST OF PRODUCTION OF FARM CROPS—AVERAGE

Items of expense		Oats	Wheat	Barley	Mixed grain	Corn silage	Sunflower silage	O.P.V. silage	Swede turnips	Hay, first year	Hay, second year
Number of years		9	9	9	8	8	9	7	9	9	7
Rent and taxes	$	4 00	4 00	4 00	4 00	4 00	4 00	4 00	4 00	4 00	4 00
Manure	$	11 34	11 34	11 34	10 50	15 00	15 11	15 43	16 14	7 56	3 71
Seed	$	3 40	4 22	3 07	4 18	1 14	1 60	6 11	1 05	1 82	1 80
Machinery	$	2 85	2 85	2 85	2 85	3 60	3 52	3 28	2 85	2 85	2 85
Twine	$	0 49	0 35	0 39	0 44	0 27	0 37	0 09	.....	.....	.....
Manual labour	$	5 31	4 46	4 72	5 78	24 06	27 65	12 41	38 64	5 34	4 66
Horse labour	$	1 55	1 36	1 57	1 68	4 31	4 80	2 61	5 11	0 97	0 85
Tractor labour	$	1 57	1 59	1 64	1 71	6 20	6 59	5 22	4 88	.....	.....
Threshing	$	2 06	1 35	1 61	2 27	.....	.....	.....	.....	.....	.....
Total cost per acre	$	32 57	31 52	31 19	33 41	58 58	63 64	49 15	72 67	22 54	17 87
Yield per acre	bush.	51·50	19·23	32·23	44·61	tons 13·95	tons 15·133	tons 2·261	tons 17·684	tons 2·275	tons 2·107
Yield per acre, straw	tons	0·934	0·786	0·877	1·00	.....	.....	.....	.....	.....	.....
Value per acre	$	32 63	30 07	31 64	37 31	51 80	57 14	26 95	35 83	23 99	22 41
Value per acre, straw	$	3 73	1 57	3 51	4 00	.....	.....	.....	.....	.....	.....
Total value per acre	$	36 36	31 64	35 15	41 31	51 80	57 14	26 95	35 83	23 99	22 41
Profit or loss per acre	$	3 79	0 12	3 96	7 90	−6 78	−6 50	−22 20	−36 84	1 45	4 54
Cost per ton or bushel—considering value of straw	$	0 568	1 56	0 87	0 676	4 20	4 21	7 85	4 11	9 91	8 48

TOP-DRESSING HAY LAND WITH BARNYARD MANURE

In 1921 a five-acre field was divided into two equal parts. One section was top-dressed at the rate of 20 tons manure pe acre in the spring of 1921 and 16 tons per acre in the fall of 1925. The other section was left untreated. The yield of hay in 1930 on the manured area was 1·528 tons per acre and on the unmanured area, 0·936 of a ton. The average yield covering the ten-year period 1921-30 was 2·108 tons and 1·539 tons respectively.

The yields are not a true ind cation of the difference between the two areas. The quality of hay has decreased rapidly on both sections, but on the unmanured area the crop was very largely made up of weeds such as king devil, golden rod, sedges and fall dandelion. These weeds are present in the manured area, but to a lesser degree. The experiment demonstrates that even a heavy application of manure will not keep up the quality of hay required for feeding purposes, much less for market requirements. The unmanured areas have been a good demonstration of how quickly productive land will become unproductive when cultivation and fertilization cease. The spread of weeds from such areas to cultivated lands is deplorable and is one of our present-day problems.

FERTILIZER AND LIMESTONE EXPERIMENTS ON DYKE LANDS

In 1922 a series of experiments were started on the dyke lands connected with this Farm. These are being continued as outlined in the 1929 report. The data collected in 1930 do not change the results to any appreciable extent and further information is necessary before definite deductions can be made on many of the experiments. The yields in 1930 were excellent, far better than on untreated areas adjoining and the entire dyke area is worthy of inspection when visiting the Farm.

PASTURE IMPROVEMENT EXPERIMENT, 1930

The pasture improvement experiment begun at this Farm in 1929 was continued in 1930, using dairy cattle instead of sheep as a medium for keeping the lots closely grazed.

A ten-acre field was divided into five two-acre fields in 1929 as follows:—

Plots 1, 2, 3 and 4, fertilized on May 29 with 475 pounds per acre of a complete fertilizer made up of 100 pounds ammonium sulphate, 300 pounds superphosphate and 75 pounds muriate of potash. Three subsequent applications of 50 pounds ammonium sulphate per acre were made at intervals of three weeks. Plot 5 was not fertilized.

In 1930 the same treatment was applied on April 25, as in May, 1929. One subsequent application of 100 pounds of ammonium sulphate was applied on July 6. Plot 5 remained unfertilized.

The field used in this experiment has been in sod for at least twenty-five years and had been used as pasture the greater part of this time. The part of the field covered by plot 5 was producing the best quality of pasturage previous to the start of the experiment. Plots 1, 2 and 3 were rotationally grazed, plots 4 and 5 continuously grazed.

The cows were turned on the pasture on May 24. It was used as a day pasture until July 1; then as day and night pasture until August 4.

The fields became so dry, due to the long spell of hot sunshine and low rainfall, that the cows were removed on that date and only a small number put back on August 11. From August 25 until September 27, it was used as a night pasture. After that date there was not sufficient feed to warrant further pasturing.

On May 29, 4 yearling heifers were turned on as a follow-up group on the rotation area and on June 12, 12 more yearlings and two-year olds were added. These were removed on August 20. The average weight of the 16 heifers when

turned on was 622 pounds and when removed, 648 pounds, with an average feeding period of 64 days. Three of the heifers freshened during this time and were removed.

In calculating the cow days per acre, two heifer days are used as equalling one cow day and each day or night the cows were on pasture was recorded as one half of one cow day.

The following table gives a summary of the carrying capacity of the different lots:—

CARRYING CAPACITY OF DIFFERENT LOTS IN PASTURE IMPROVEMENT EXPERIMENT

Month	Number of calendar days	Cow days per acre		
		Rotationally grazed; fertilized	Continuously grazed; fertilized	Continuously grazed; unfertilized
May	7	8·6	8·0	8·0
June	30	54·5	63·0	31·0
July	31	84·6	136·5	89·0
August	31	33·2	23·0	22·0
September	27	33·8	40·5	27·0
Total	126	214·5	271·0	177·0
Average number cows per acre per day	.....	1·7	2·15	1·40

As the number of cows varied from week to week, it is impossible to give the exact number on the pastures at any given period. When the growth of grass was getting rank, more were added and, as it became dry, some were removed. The table, however, gives the number of cow days per acre on each lot for each month, which shows the average carrying capacity during the summer.

From June 14 until July 12 no meal was fed. After the latter date a light ration was fed the higher producers, from 2 to 4 pounds per day. In August this was increased slightly as the pastures became dry. No green feed was fed during the pasture season.

In the rotationally grazed areas a total of 475·5 pounds of meal per acre was consumed, or an average of 3·2 pounds per cow per day, compared with 3·53 pounds per cow per day fed in 1929 and 4·5 pounds in 1928.

On the continuous fertilized pasture area a total of 317 pounds of meal was consumed per acre of 2·34 pounds per cow per day. While on the continuous unfertilized area 761 pounds per acre were consumed or an average of 4·3 pounds per cow day.

This shows a saving of 1·1 pounds of meal per cow per day on the fertilized rotational grazed area and 1·96 pounds on the fertilized continuous grazed area, as compared with the unfertilized area.

The coarse bunches of grass that the cattle would not graze off were cut and the pasture was harrowed twice with a chain harrow to scatter the droppings. More frequent harrowing would aid in closer grazing and will be practised another year.

HORTICULTURE

The fruit trees and shrubs came through the winter of 1929-30 in a very satisfactory condition. The season was very free from bad sleet storms or heavy drifting of snow, yet there was sufficient snowfall during the winter to protect the perennials and bulbs well. Had the snow covering remained more constant throughout the spring months, it would have been better for the strawberries. Areas which were exposed to any extent were subjected to too much thawing and freezing and this, with the very dry season, resulted in a poorer crop than usual. Spring opened early and planting was possible in most gardens during

the first two weeks of May. At the Experimental Farm, the beets, carrots, corn and parsnips were planted on May 14. Potatoes were planted on May 22. Where early seeding of vegetables was practised, good crops were harvested. The late plantings did not receive sufficient moisture.

The apple crop made one of the best showings at this Farm for a number of years. The fruit of most varieties was clean, of good size and exceptionally well coloured. The McIntosh was fairly free from spots until just about picking time, when spots developed very badly. The varieties of apples that have grown very well here and seem best suited to this district are, for early apples, Yellow Transparent, Duchess and Red Astrachan; for late varieties, Tolman Sweet, Baxter, Wealthy, McIntosh Red, Golden Russet, Northern Spy, Grimes Golden and Pewaukee.

The following table gives the financial statement or returns from a small commercial orchard of $2\frac{1}{2}$ acres:—

Pruning, 1 man 40 hours at 34 cents	$ 13	60
Gathering limbs, 1 man 10 hours at 34 cents	3	40
Gathering limbs, 1 man and team 10 hours at 54 cents	5	40
Spraying, 1 man 60 hours at 31 cents	18	60
Spraying, 2 horses and 1 man 30 hours at 54 cents	16	20
Spray material	29	70
Miscellaneous labour, 60 hours at 31 cents	18	60
Harrowing, 1 man 2 horses 5 hours at 54 cents	2	70
Harrowing, tractor 10 hours at $1	10	00
Fertilizer	11	88
Picking fruit, 1 man 230 hours at 31 cents	71	31
Hauling apples to warehouse, 1 man 14 hours at 31 cents	4	34
301 barrels at 60 cents	180	60
	$ 385	53
To 280 barrels of marketable apples at $2.50	$ 700	00
Less cost of operation	385	53
	$ 314	47

Spray material used:—
30 gallongs of lime sulphur at 27 cents.
21 pounds arsenate of lime at 6·5 cents.
11·25 pounds black leaf 40 at $1.
12 pounds aluminum sulphate at $0.03.

SMALL FRUITS

Strawberries

The following is an outline of a fertilizer test on strawberries. It was started in 1927 on plots 5 x 72.

Series 1.—No fertilizer.

Series 2.—Nitrate applied at the rate of 300 pounds per acre one month after planting.

Series 3.—Nitrate applied at the rate of 300 pounds per acre August 1.

Series 4.—Nitrate applied at the rate of 300 pounds per acre September 1.

Series 5.—Nitrate 300 pounds and acid phosphate 200 pounds applied per acre July 1.

Series 6.—Nitrate 300 pounds, phosphate 200 pounds per acre applied on September 1.

Series 7.—Nitrate 300 pounds, phosphate 200 pounds per acre applied September 1, and 150 pounds of phosphate applied early in the spring of the fruiting year.

In 1929 the plots were not uniform. Due to winter-killing the data collected had but little value. Therefore, a trial was begun in 1930 in picking the fruit from individual plants. A full plot was 60 plants, but the 1930 records were taken off 40 representative plants from each plot. Each series was planted five times and the following are the average yields taken from the five replications:—Series 1, 34·66 pounds; Series 2, 39·09 pounds; Series 3, 33·21 pounds; Series

4, 38·25 pounds; Series 5, 31·66 pounds; Series 6, 32·62 pounds, and Series 7, 33·75 pounds. The one year's results do not reveal very much information of value.

Raspberries

The following records were taken on each of the varieties named below. Each plot consists of 42 bushes, or 1/41·5 of an acre. Wherever a bush or cane is missing in a plot, corrected yields are made. Therefore the yield comparisons are based on 100 per cent.

Dates of Picking and Yields of Raspberries

Variety	Pickings		Yield per acre
	Early	Last	
			lb.
Red Ruby	July 12	Aug. 4	3,418·8
Herbert	" 18	" 4	3,333·7
King	" 12	" 4	2,739·0
Newman	" 18	" 4	2,427·8
St. Regis	" 12	" 4	1,877·0
Cuthbert	" 18	" 4	1,379·9

Regardless of the heavy culling the previous year, all varieties indicated the presence of mosaic, which must be coming from the native bushes growing around and in the shelter belt.

Black Currants

The following yields were recorded for the season of 1930. Each plot consists of 12 bushes, or 1/165 of an acre. The bushes are planted 4 by 5½ feet. If a bush is missing, the yields are averaged per bush and a corrected yield is taken to make comparisons of yields on an equal basis.

Yields of Black Currants

Variety	Yield per plot	Yield per acre
	lb.	lb.
Topsy	12·0	1,980·0
Saunders	6·0	990·0
Climax	6·0	990·0
Victoria	4·5	742·5
Boskoop Giant	4·5	742·5

Red Currants

The following yields were recorded for the season of 1930. Each plot consists of 12 bushes, or 1/165 of an acre. The bushes are planted 4 by 5½ feet. If a bush is missing, the yields are averaged per bush and a corrected yield is taken to make comparisons of yields on an equal basis.

Yields of Red Currants

Variety	Yield per plot	Yield per acre
	lb.	lb.
Cherry	80·0	13,200
Perfection	75·0	12,375
Wilder	75·0	12,375
Fay Prolific	61·5	10,148
London Market	10·5	1,733

Gooseberries

The following yields were recorded for the season of 1930. Each plot consists of 12 bushes, or 1/165 of an acre. The bushes are planted 4 by 5½ feet. If a bush is missing, the yields are averaged per bush and a corrected yield is taken to make comparisons of yields on an equal basis.

Yields of Gooseberries

Variety	Yield per plot	Yield per acre
	lb.	lb.
Red Jacket	55·25	10,939·5
Silvia	50·37	9,066·8
Pearl	53·62	8,847·3
Charles	39·0	7,020·8
Rideau	35·75	5,898·8
Deacon	32·5	5,362·5
Barrett	32·50	5,362·5
Mabel	30·87	5,093·6
Duncan	27·62	4,971·5

VEGETABLES

Potatoes

The unit stock selection of disease-free Irish Cobbler seed was continued and all units showing any signs of disease were eliminated. Some of the units have now been passed as disease-free for eight consecutive years.

Ten potatoes of each unit stock were taken and each potato cut into four sets. These sets were planted 16 inches apart in the rows 32 inches apart. The yields ranged from 80 pounds to 134 pounds from the ten potatoes.

Sprouting with Potatoes

This project has as its objective a further study of the relative merits of different methods of handling seed potatoes.

The test is divided into three divisions: (a) potatoes that are subjected to subdued light at a temperature of 40 to 50 degrees Fahrenheit for four weeks; (b) potatoes that have been kept dormant all spring; (c) potatoes taken from the general bin.

Planting was carried out on May 26, 1930, on duplicate plots. The following table gives the results of 1930, also a six-year average:—

Results of Potato Sprouting Test, 1930

Variety	Treatment	Yield per acre, 1930		6-year average yield per acre
		Marketable	Unmarketable	
		bush.	bush.	bush.
Irish Cobbler	General	390·59	87·12	209·29
	Subdued	291·85	76·96	194·60
	Dormant	387·86	110·35	216·55

The average yield obtained over a period of six years is in favour of keeping the potatoes in a dormant state previous to planting.

DATES OF PLANTING POTATOES, 1930

Variety	Date planted, 1930	Yield per acre, 1930		5-year average yield per acre	
		Marketable	Unmarketable	Marketable	Unmarketable
		bush.	bush.	bush.	bush.
Irish Cobbler	May 22	383·33	76·96	233·60	31·46
	" 30	232·32	39·20	181·18	27·24
	June 6	357·19	84·22	203·38	38·28

All things being equal, the early planting is favoured.

TOMATOES—PRUNING EXPERIMENT

This trial is to study the relative merits of pruning tomato plants for the development of ripe fruit. The procedure followed was to prune all plants in the first plot to one truss, the second to two truss and the third to three truss, leaving one plot unpruned.

The following table gives the results taken from the 1930 records:—

RESULTS OF PRUNING EXPERIMENT WITH TOMATOES

Variety	Treatment	Yield per plot	
		Ripe	Green
		lb.	lb.
Alacrity	1 stem first truss	58	8
Alacrity	1 stem second truss	64	22
Alacrity	1 stem third truss	40	22
Alacrity	Not pruned	55	33
Bonny Best	1 stem first truss	39	10
Bonny Best	1 stem second truss	36	38
Bonny Best	1 stem third truss	40	34
Bonny Best	Not pruned	34	121

While more ripe fruit was obtained from the pruned plants, a very high percentage was unmarketable due to split fruit. The fruit seemed to grow too fast and as a consequence split.

BEANS—COST OF PRODUCTION

The following data on yield and cost of production were compiled on the production from 1·77 acres:—

Rent of land at $4 per acre	$ 7 08
Machinery at $2.85 per acre	5 04
Manure, 15 tons at $2 per ton	30 00
Ploughing, 1 man and 3 horses 10 hours at 64 cents	6 40
Harrowing, tractor 3 hours at $1	3 00
Harrowing, 1 man and 2 horses 2 hours at 54 cents	1 08
Seed, 90 pounds at 12 cents	10 80
Seeding, 1 man and 2 horses 2·5 hours at 54 cents	1 35
Cultivating, 1 man and horse 15 hours at 44 cents	6 60
Hoeing, 1 man 34 hours at 31 cents	10 54
Pulling and stacking, 1 man 28 hours at 31 cents	8 68
Hauling in, 1 man 4 hours at 31 cents	1 24
Threshing and cleaning, 58 hours at 31 cents	17 94
	$ 109 75
To 39·33 bushels at $3 per bush	$ 117 99
By cost of 1·77 acres	109 75
Returns over labour cost per acre	$ 8 24

Bear in mind that in the above figures on the cost of production, fair rental has been charged up against the crop for both land and machinery; also all labour charged at a fair rate.

FLORICULTURE

From a florist's standpoint, the season could be termed only fair. The spring opened early and transplanting into the open was made possible at a very early date. At this Farm, however, the annuals were not transplanted to the open until June 11 and completed about June 15. Those planted out on June 11 began to bloom on August 7 and completed their bloom about the second day of September. The last killing frost in the spring was recorded on May 24 and the first in the fall was on October 3. Excellent bloom was noted during the early part of the blooming season, but the quantity and quality were affected by the very dry weather experienced throughout the season, but more especially during the early part of the growing season. The rainfall for April was 0·97 inches, May 1·86 inches, June 1·76 inches, and July 3·44 inches, nearly 3 inches less than the usual rainfall for that period.

The 1928 annual report from this Farm gives a complete list of the annuals that have grown here and found to do well.

Gladioli

The new gladioli made a splendid showing. The first to come into bloom was Banshee and Maiden's Blush on July 19, and completed their bloom on August 10 and 15 respectively. The bloom period ranged from July 19 to August 30.

Dahlias

One hundred and eleven dahlias were set out on May 7 and the first bloom was recorded on July 16. The blooming continued until the first of October. Regardless of the dry weather, all varieties made an excellent showing.

Perennials

The perennials, as usual, came through the winter in very good condition and while the bloom was fairly good during the early part of the season, it did not last as long as usual, due to insufficient moisture. The following is a list of the more hardy varieties:—Iris, perennial phlox, campanula, hemerocallis, sweet william, thermopsis, peonies and hollyhock.

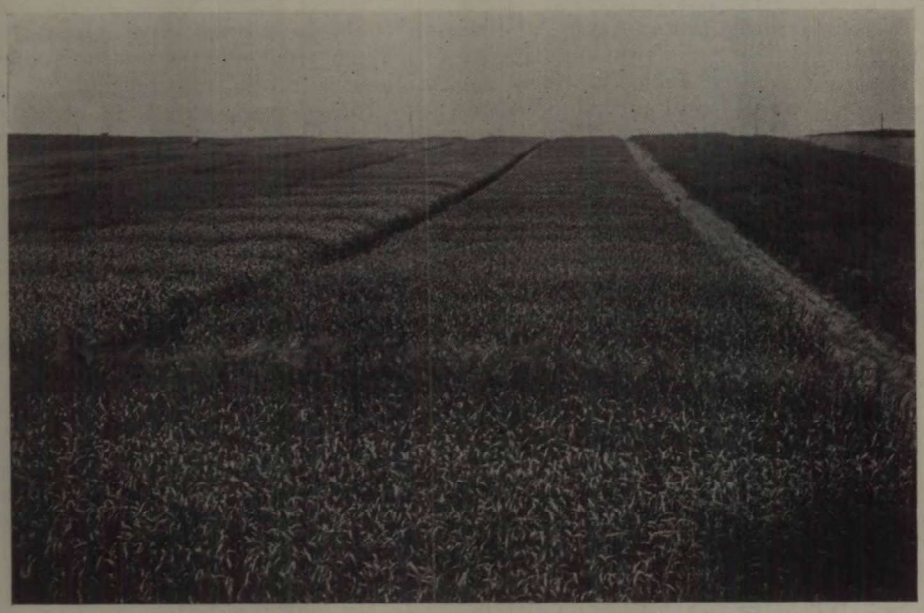
CEREALS

The spring of 1930 opened up early. Seeding operations were started on May 1, and except for a few odd lots, seeding in this division was completed on May 10. Due to cool weather, germination was slow, but good stands developed and growth throughout the season was very satisfactory. Very little lodging occurred and diseases were not prevalent.

VARIETY TESTS OF GRAIN

The leading varieties of wheat, oats and barley were tested in quadruplicate plots of one one-hundred-and-twentieth acre each. Guard rows were used in order that field conditions might be approximated as nearly as possible. In addition to these nineteen varieties of wheat, twenty-five of oats and thirty-two of barley were tested in rod-row plots. These plots consist of five drills seven inches apart, each 18·5 feet long. At harvest time one foot is cut from each end, leaving the plot exactly 16·5 feet long. The two outer rows of each variety are discarded in an attempt to eliminate varietal competition. Not less

than four plantings in different parts of the field are used and where more accurate data in the shortest possible time are desired, eight plantings appear. Seven varieties of beans and ten of peas were also tested in rod-rows. The work on oat classification, head selection and hybrid material was continued.



Rod-row variety tests

Spring Wheat

Six varieties were under test in the large comparative trial plots. These were seeded on May 8 and harvested as each variety matured. Early Red Fife, Huron and White Russian continue to lead over a period of eight years.

The following table gives the 1930 and average results:—

Results of Variety Test of Spring Wheat

Variety	Number of years tested	Average number of days to mature	Yield per acre, 1930	Average yield per acre
			bush.	bush.
Early Red Fife, Ottawa 16	8	105·8	36·88	32·51
Huron, Ottawa 3	8	105·8	39·12	32·26
White Russian	8	108·0	38·38	32·26
Marquis, Ottawa 15	8	104·1	37·88	30·21
Ruby, Ottawa 623	8	99·5	31·38	26·17
Garnet, Ottawa 652	5	96·2	34·12	24·83

Variety Test of Spring Wheat in Rod-rows

The following table gives the data from the tests of wheat in rod-rows over the period from 1924-29 inclusive. The yield, relative yield and other characters of economic importance are reported. The first group are from an eight seeded series, while the latter are from only four seedings.

RESULTS OF VARIETY TEST OF WHEAT IN ROD-ROWS, 1924-29

Variety	Number of years tested	Number of days to mature	Length of straw	Strength of straw on scale of 10 points	Weight per measured bushel after cleaning	Weight per 1,000 kernels	Yield per acre	Relative yield per acre, Huron, O. 3 =100
			in.		lb.	gms.	bush.	per cent
Garnet	6	97·2	38·04	9·50	64·00	34·5	32·95	90·9
Huron, Ottawa 3	6	109·0	44·65	9·96	64·25	41·2	36·25	100·0
Huron Cap Rouge	6	109·0	44·78	9·96	62·75	40·8	35·52	98·0
Early Red Fife	6	109·0	43·77	9·94	62·37	43·6	33·33	92·0
White Fife	6	110·5	43·21	9·83	60·87	38·3	28·18	77·7
								Marquis 0·15=100
Master	6	95·3	36·67	9·50	63·67	39·1	26·22	99·9
Reward	6	97·5	38·12	9·67	66·50	39·5	27·42	104·4
Ruby	6	99·0	39·92	9·58	63·87	35·4	28·73	109·5
Major	6	100·3	42·50	9·67	63·37	38·3	29·98	114·2
Early Triumph	6	101·8	40·92	9·71	63·25	38·7	30·95	117·9
Bishop	6	103·5	42·79	9·67	62·50	40·7	32·82	125·0
Marquis	6	103·5	41·30	9·71	62·50	36·7	26·25	100·0
Early Russian	6	105·8	42·42	9·42	63·00	41·8	32·68	124·5
Red Fife	6	107·5	44·21	9·83	61·37	37·9	29·90	113·9
Charlottetown 123	6	107·3	44·96	9·75	60·87	40·5	37·80	144·0

OATS

Seven varieties were seeded on May 8 and 9 in the large comparative trial plots and each variety harvested as it matured. Victory, Banner and Gold Rain lead over a period of eight years.

The following table gives the results to date:—

RESULTS OF VARIETY TEST OF OATS

Variety	Number of years tested	Average number of days to mature	Yield per acre, 1930	Average yield, per acre
			bush.	bush.
Victory	8	101·0	90·88	76·26
Banner, Ottawa 49	8	101·0	86·47	75·10
Gold Rain	8	100·3	88·24	73·25
O.A.C. No. 72	8	101·0	87·35	71·40
Alaska	7	88·0	57·76	.....
Laurel (hulless), Ottawa 477	7	95·3	60·88	.....
Legacy, Ottawa 678	3	93·0	71·00	.....

VARIETY TEST OF OATS IN ROD-ROWS

The results of the test with oats in rod-rows are given in the table which follows. These data were collected over a period of six years from 1924-29 inclusive. The first group in the table are from the series seeded eight times, while the last group are from a series which was seeded only four times.

RESULTS OF VARIETY TEST OF OATS IN ROD-ROWS, 1924-29

Variety	Number of years tested	Number of days to mature	Length of straw	Strength of straw on scale of 10 points	Weight per measured bushel after cleaning	Weight per 1,000 kernels	Yield per acre	Relative yield per acre, Victory =100
			in.		lb.	gms.	bush.	per cent
Alaska	6	88·0	43·21	8·64	37·00	38·1	88·65	90·2
Liberty	6	91·3	43·77	8·40	48·75	27·1	55·97	57·0
Legacy	6	94·3	42·15	8·21	34·42	32·4	93·53	95·2
Gold Rain	6	99·7	47·93	8·60	39·00	34·4	91·74	93·4
Victory	6	100·5	46·87	8·77	39·17	40·0	98·26	100·0
Banner, Ottawa 49	5	99·4	47·30	8·53	35·58	38·4	89·65	91·3
Banner, M.C. 44	6	100·3	46·54	9·15	38·17	37·0	93·68	95·3
								O.A.C. 72 =100
Leader A	6	90·8	44·40	7·92	33·58	34·8	83·32	92·5
Laurel	6	94·5	42·83	9·08	53·42	28·6	62·15	69·0
Irish Victor	6	98·5	47·74	8·85	36·75	37·1	97·12	107·8
Leader B	6	98·0	45·71	7·94	31·42	39·1	95·41	105·9
Banner Langille	6	98·7	46·96	8·62	37·67	37·1	83·00	92·1
Columbian	5	99·2	47·85	8·40	37·17	39·8	83·85	101·6
Lincoln	6	99·7	47·93	8·67	36·58	41·7	93·00	103·2
Mansholts III	6	99·7	48·25	8·71	36·50	40·6	94·56	105·0
Prolific	6	100·2	47·90	8·79	38·83	38·7	85·12	94·5
O.A.C. No. 72	6	100·2	48·42	8·67	37·00	41·1	90·09	100·0
Danish Island	5	99·4	47·40	8·25	34·92	40·3	82·35	99·8
Banner Dixon	6	100·3	50·28	8·54	36·00	39·5	85·56	95·0
Banner Dow	6	100·3	47·32	8·58	36·17	37·6	95·12	105·6
Banner McColm	6	100·3	47·26	8·67	36·67	37·9	94·35	104·7
Banner Sask. 99	6	100·3	47·44	8·71	36·17	38·0	91·06	101·1
Banner Sask. 144	6	100·3	47·86	8·79	38·00	38·0	89·50	99·3
Banner Waugh	6	100·3	47·19	8·92	36·42	38·4	94·26	104·6
Banner Cap Rouge	6	100·3	46·64	9·00	36·58	37·8	93·71	104·0
Banner Univ. of B.C.	6	100·3	46·39	8·92	36·75	37·7	89·24	99·1
Banner Griffin	6	100·3	46·12	8·79	38·33	41·3	82·15	91·2

BARLEY

Seven varieties were tested in the large comparative trial plots. These were seeded on May 10 and each variety was harvested as it matured. Charlottetown No. 80, a two-rowed sort, has given the highest yield over a period of eight years.

The following table gives the data to date:—

RESULTS OF VARIETY TEST OF BARLEY

Variety	Number of years tested	Average number of days to mature	Yield per acre, 1930	Average yield per acre
			bush.	bush.
Two-rowed				
Charlottetown No. 80	8	95·8	48·90	49·83
Gold	5	93·4	59·85	.....
Six-rowed				
Himalayan (hulless), Ottawa 59	8	84·5	39·23	44·71
Mensury, Ottawa 60	8	87·9	47·35	44·59
O.A.C. No. 21	8	88·2	37·65	43·32
Bearer, Ottawa	3	92·3	51·73	.....
Star	3	84·7	44·23	.....

VARIETY TEST OF BARLEY IN ROD-ROWS

The following table gives the results of the tests with barley in rod-rows. The varieties are gouped in the same manner as were the wheat and oats. Here again Charlottetown No. 80 has shown its superiority.

RESULTS OF VARIETY TEST OF BARLEY IN ROD-ROWS, 1924-29

Variety	Number of years tested	Number of days to mature	Length of straw	Strength of straw on scale of 10 points	Weight per measured bushel after cleaning	Weight per 1,000 kernels	Yield per acre	Relative yield per acre, Charlottetown 80 =100
			in.		lb.	gms.	bush.	per cent
Mensury Ottawa 60	6	86·8	41·46	9·10	50·50	42·6	61·12	89·5
Early Chevalier	6	86·8	41·86	8·25	52·17	48·9	57·85	84·7
O.A.C. No. 21	6	87·8	41·35	8·46	53·42	40·4	62·23	91·1
Bearer	6	95·7	40·75	7·94	50·58	38·1	57·27	83·8
Gold	6	95·2	33·87	7·98	53·92	44·6	58·31	85·3
Charlottetown No. 80	6	96·0	37·73	8·79	53·58	44·3	68·33	100·0
								Manchurian =100
Albert	6	80·2	36·12	10·00	50·67	44·3	44·12	77·8
Feeder	6	84·0	40·21	8·87	50·75	40·9	46·23	81·5
Manchurian	6	93·2	41·96	8·62	51·42	40·1	56·73	100·0
Manchurian Cap Rouge	6	93·2	41·54	8·62	52·67	40·5	61·94	109·2
Duckbill Ottawa 57	6	96·0	39·83	9·54	51·17	53·4	39·31	69·3
Duckbill M.C. 207	6	95·5	40·71	9·42	52·25	51·8	44·85	79·1
Duckbill Nappan	6	95·5	41·08	9·29	52·75	54·1	48·65	85·8
French Chevalier	6	95·8	44·25	9·12	54·50	50·2	52·08	91·8
Haanchen	6	95·3	37·42	6·37	52·25	44·9	60·12	106·0
Swedish Chevalier	6	97·0	38·83	7·46	52·25	48·0	49·33	87·0
Himalayan	6	83·5	28·00	8·04	64·17	44·1	48·06	84·7
Guy Mayle	6	83·5	31·83	7·75	63·83	42·2	47·75	84·2

BUCKWHEAT

Twelve varieties and selections have been under test for the past six years and the following table gives the results to date:—

RESULTS OF VARIETY TEST OF BUCKWHEAT

Variety	Number of years tested	Yield per acre, 1930	Average yield per acre
		bush.	bush.
Japanese J	6	60·71	50·07
Grey F	6	62·67	47·16
Grey D	6	47·00	46·22
Japanese M	6	49·94	45·26
Russian H	6	51·90	45·26
Petrograd	6	50·92	42·78
Tartarian G	6	57·77	40·62
Silverhull J	6	48·96	40·53
Tartarian D	6	52·87	40·43
Rye H	6	61·69	36·76
Rye A	6	51·90	36·62
Rye F	6	49·94	36·51

REGISTERED SEED GRAIN

The production of registered seed grain was continued, and 485 bushels of Banner Oats, 148 bushels of Charlottetown No. 80 barley and 23 bushels of Huron wheat will be cleaned and made available to farmers desiring seed of this class. In addition to this, 47 bushels of Garnet wheat and 88 bushels of Gold Rain oats were produced. The grain was all of good quality and had an exceptionally high weight per measured bushel.

SEED CLEANING PLANT

The seed cleaning plant was again in operation during the past year. In all, some 1,750 bushels of grain were cleaned, of which 850 bushels were of our own growing, the remainder being that brought in by neighbouring farmers.

FORAGE CROPS

Variety tests of swedes, mangels, carrots, corn, sunflowers and millets were continued. Regional strains of red clover are being tested for yield, winter hardiness and general suitability. Various mixtures of grasses, with red and alsike clovers as bases, are under test to determine their value for hay and pasture uses. Methods of seeding alfalfa are being investigated and a definite effort is being made to develop strains of this crop suitable for Maritime conditions.

The production of Bangholm Club-Root Resistant swede seed is being continued and finds a ready market with farmers whose land is infected with this troublesome disease. Apparently a more rigid selection is necessary and plans are being made to follow a definite breeding program with this variety.

Weather conditions at seeding time were very favourable and seeding operations carried out in good time and under excellent conditions insofar as the seed bed was concerned.

Rainfall was light during the growing season, but germination was very even and crops got away to a good start with the result that above average yields were recorded and crops were of good quality. Favourable weather conditions prevailed at harvest time and all crops were stored in good condition.

CROPS FOR ENSILAGE

Indian Corn

Twenty-four varieties or strains were tested during the season of 1930, in one-two hundredth acre plots replicated four times. The seed was sown on June 4 and harvesting was completed on September 20. Over a period of eight years the same varieties continue to lead in the production of dry matter per acre. Burr Leaming, a hybrid variety which has been tested for only seven years, considerably outyields North Dakota, 90 Day White Dent and Northwestern Dent, the leaders over a period of eight years, when a comparison is made of their dry matter production in the same years. On a relative yield basis, it would appear that there is a considerable difference in the productivity of the different strains of Northwestern Dent that are on the market.

The following table gives 1930 and average yields:—

Corn Variety Test, 1930, and Average Yields

Variety	Source	Number years tested	Green yield per acre		Percentage dry matter		Dry matter per acre	
			1930	Average	1930	Average	1930	Average
			tons	tons	%	%	tons	tons
North Dakota	Steele, Briggs	8	24·480	18·919	17·339	14·898	4·239	2·813
90 Day White Dent	Dakota Improved Seed Co.	8	19·340	18·277	20·573	15·236	3·976	2·743
Northwestern Dent	Dakota Improved Seed Co.	8	17·300	16·964	20·982	16·013	3·606	2·708
Longfellow	Duke	8	20·900	18·914	20·109	14·330	4·199	2·686
Golden Glow	Duke	8	23·480	16·775	19·759	15·458	4·632	2·636
White Cap Yellow Dent	Steele Briggs	8	24·300	15·899	18·600	15·356	4·510	2·477
Wisconsin No. 7	Duke	8	17·460	16·175	19·431	14·725	3·389	2·397
Burr Leaming	Carter	7	24·000	22·040	18·611	15·260	4·463	3·365
Hybrid	Wimple	7	23·480	20·342	18·561	14·972	4·359	3·062
Yellow Dent	Wimple	7	23·940	18·092	19·284	15·249	4·608	2·785
Compton's Early	Duke	7	21·940	19·458	18·481	14·026	4·057	2·757
Bailey	Duke	7	22·840	17·760	19·545	15·412	4·458	2·747
Leaming	Duke	7	22·300	18·745	19·839	13·575	4·421	2·707
Quebec 28	McDonald College	7	16·600	16·670	22·002	16·059	3·652	2·653
Northwestern Dent	Brandon	7	11·340	12·965	26·498	17·518	3·004	2·259
Amber Flint	Wimple	7	13·560	14·686	18·022	14·683	2·448	2·166
Northwestern Dent, North Dakota Grown	McKenzie	6	16·680	14·997	23·924	17·071	3·961	2·584
Longfellow	Dakota Improved Seed Co.	5	.....	19·900	.....	13·563	.....	2·694
Pride Yellow Dent	Dakota Improved Seed Co.	5	18·700	15·112	20·890	17·116	3·890	2·659
Northwestern Dent, Nebraska Grown	McKenzie	4	.....	19·684	.....	14·820	.....	2·875
Longfellow	Popp and Lang	3	21·900	23·093	19·557	15·126	4·280	3·452
Canada Yellow Flint	Dupuy and Ferguson	3	.....	17·378	.....	15·328	.....	2·609
Wisconsin No. 7	Parks	3	.....	16·708	.....	13·797	.....	2·355
Quebec 28	Dr. Todd	3	.....	12·870	.....	14·312	.....	1·876

SUNFLOWERS

Five varieties were under test in 1930 in plots similar to those used for Indian Corn. Of these one failed to germinate and yields are reported for only four varieties. Seeding was completed on May 27 and all varieties harvested on August 18. Mammoth Russian and Russian Giant continue to lead in the production of dry matter over a period of years. Following are the 1930 and average results:—

SUNFLOWER VARIETY TEST, 1930, AND AVERAGE YIELDS

Variety	Source	Number of years tested	Green yield per acre		Percentage dry matter		Dry matter per acre	
			1930	Average	1930	Average	1930	Average
			tons	tons	%	%	tons	tons
Mammoth Russian	McDonald	8	24·580	24·323	16·277	15·745	3·992	3·739
Ottawa 76	C.E.F.	8	19·940	18·443	16·710	14·522	3·334	2·657
Manchurian	McKenzie	7	17·660	17·348	16·675	14·497	2·931	2·465
Mennonite	Rosthern	7	14·200	12·296	15·110	14·870	2·143	1·807
Russian Giant	Dakota Improved Seed Co.	5	.....	24·717	.....	14·458	.....	3·550

ROOTS

MANGELS

Thirty-four varieties were tested in 1930. These were seeded on May 23 and harvested between October 7 and 9. All varieties germinated well and the stand was almost perfect. Giant Rose Half Sugar continues to lead in the production of dry matter per acre over a period of seven years, although it is very closely followed by several other varieties as will be noted in the following table.

The following table gives the 1930 and average yields of all varieties tested for five years or more:—

MANGEL VARIETY TEST, 1930, AND AVERAGE YIELDS

Variety	Source	Number of years tested	Green yield per acre		Percentage dry matter		Dry matter per acre	
			1930	Average	1930	Average	1930	Average
			tons	tons	%	%	tons	tons
Giant Rose Half Sugar	Ewing	7	23·188	21·194	15·467	14·330	3·586	3·019
Leviathan	Rennie	7	30·250	26·686	12·627	11·254	3·820	3·014
Yellow Intermediate	C.E.F.	7	28·134	23·022	15·252	13·263	4·291	3·004
Danish Sludstrup	Ewing	7	25·655	22·354	14·677	13·343	3·765	2·957
Fjerritslev Barres	Hartmann	7	33·070	25·456	12·190	11·356	4·031	2·876
Eckendorfer Yellow	Hartmann	7	33·528	27·157	11·317	10·591	3·794	2·856
Perfection Mammoth Long Red	Rennie	7	28·453	22·538	13·512	12·619	3·845	2·836
Jumbo	Rennie	7	29·615	24·855	12·185	11·450	3·609	2·822
Stryno Barres	Hartmann	7	35·147	25·911	11·102	11·051	3·902	2·784
Long Red Mammoth	Ewing	7	25·960	21·799	14·785	12·892	3·838	2·770
Barres Half Long	General Swedish Seed Co.	7	23·888	22·620	14·717	12·437	3·516	2·760
Red Eckendorfer	General Swedish Seed Co.	7	26·969	24·763	11·727	11·001	3·164	2·733
Long Yellow	Ewing	7	24·134	20·298	14·217	13·566	3·431	2·729
Yellow Eckendorfer	General Swedish Seed Co.	7	26·755	23·792	12·197	11·523	3·263	2·717
Yellow Leviathan	Rennie	7	31·742	23·647	12·002	11·537	3·810	2·692
Barres Oval	General Swedish Seed Co.	7	27·536	22·971	12·957	11·678	3·568	2·669
Red Eckendorfer	Hartmann	7	30·158	23·527	13·330	10·968	4·020	2·570
Red Globe	Ewing	7	26·452	19·876	12·587	12·479	3·329	2·448
Golden Tankard	Rennie	7	23·562	18·989	12·442	12·583	2·932	2·395
Red Globe	Dupuy and Ferguson	7	21·473	20·258	13·665	12·093	2·934	2·395
Giant Yellow Globe	Ewing	7	31·378	23·735	10·470	10·020	3·285	2·364
Golden Tankard	Ewing	7	22·907	19·439	12·950	12·136	2·966	2·326
Giant Yellow Globe	Rennie	7	26·606	22·612	10·497	10·164	2·793	2·243
Rosted Barres	Hartmann	6	31·745	25·948	12·382	11·963	3·931	3·042
Elevatham Mammoth	Hartmann	6	27·504	23·591	12·755	12·392	3·508	2·870
Svalof Original Rubra	General Swedish Seed Co.	6	21·523	19·149	16·222	14·255	3·491	2·692
Green Top Half Sugar	Hartmann	6	.....	21·831	.....	12·436	.....	2·661
Red Top Half Sugar	Hartmann	6	.....	19·464	.....	12·555	.....	2·391
Taaroje Barres	Hartmann	5	30·025	26·454	12·030	11·408	3·612	2·996
Giant White Half Sugar	Ewing	5	29·146	22·191	13·592	13·110	3·961	2·858
Danish Sludstrup	McDonald	5	21·699	24·599	13·185	11·319	2·861	2·700

Swedes

Forty-one varieties were under test in 1930. These were seeded on May 26 and 27, and harvesting was completed on October 21. Bangholm Nappan is the leading variety in the production of dry matter over a period of seven years, but is so closely followed by several others that the difference is probably not significant. This is a club-root resistant variety and is giving good results where other varieties are unable to produce a crop. It is characterized by a high percentage of dry matter.

The following table gives the results of all varieties that have been tested for five years or more:—

Swede Variety Test, 1930, and Average Yields

Variety	Source	Number of years tested	Green yield per acre		Percentage dry matter		Dry matter per acre	
			1930	Average	1930	Average	1930	Average
			tons	tons	%	%	tons	tons
Bangholm	Nappan	7	23·368	24·414	12·030	11·798	2·811	2·860
Invicta Bronze Top	Ewing	7	24·374	28·926	10·362	9·878	2·526	2·836
Olsgaard Bangholm	Hartmann	7	29·044	29·723	9·990	9·620	2·901	2·811
Hall's Westbury	Ewing	7	25·824	29·825	10·507	9·445	2·713	2·806
Hall's Westbury	Rennie	7	27·046	27·706	11·650	10·100	3·151	2·784
Best of All	Rennie	7	24·864	27·775	10·545	9·817	2·622	2·692
Yellow Swedish	General Swedish Seed Co.	7	27·871	27·449	10·207	9·949	2·845	2·691
Ditmar's	McNutt	7	27·620	29·491	10·195	9·094	2·816	2·629
Bangholm	Ewing	7	21·289	25·987	11·945	10·264	2·543	2·620
Best of All	Ewing	7	26·723	28·690	10·160	9·232	2·715	2·619
Bangholm	General Swedish Seed Co.	7	29·350	26·487	10·625	9·945	3·118	2·618
Sutton's Champion Purple Top	Ewing	7	26·182	24·274	11·015	10·777	2·884	2·612
Invicta Bronze Top	Rennie	7	26·090	29·548	10·000	8·861	2·609	2·572
Bangholm	McKenzie	7	23·032	26·341	10·127	9·962	2·332	2·572
Improved Jumbo or Elephant	Rennie	7	27·543	27·038	10·135	9·250	2·791	2·477
Kangaroo	Ewing	7	23·720	25·608	10·217	9·398	2·423	2·369
Kangaroo	Rennie	7	29·461	24·676	10·115	9·661	2·980	2·345
Elephant or Monarch	Ewing	7	27·739	26·485	10·187	8·997	2·826	2·342
Sutton's Champion Purple Top	Rennie	6	26·039	27·992	10·507	9·652	2·736	2·704
Magnum Bonum	Rennie	6	29·713	27·117	10·067	9·205	2·991	2·458
Hazard's Improved	Rennie	6	.....	26·712	.....	9·166	.....	2·389
Kangaroo	Graham Bros.	6	16·825	23·281	9·920	10·174	1·669	2·356
Canadian Gem	Rennie	6	23·565	25·095	10·372	9·512	2·444	2·355
Bangholm	Halifax Seed Co.	5	25·732	25·662	10·752	10·842	2·767	2·761
Bangholm Sludsgaard	D.L.F.	5	25·486	24·116	12·930	11·374	3·295	2·708
Bangholm	Kentville	5	25·722	23·003	12·732	11·609	3·275	2·645
Wilhelmsburger	D.L.F.	5	26·877	26·373	9·542	9·028	2·565	2·565
Shepherd Golden Globe	Hartmann	5	.....	24·773	.....	9·833	.....	2·386

Carrots

Fifteen varieties were seeded on May 24 and harvested on October 21 and 22. The varieties that have been tested over a period of seven years rank very close in the production of dry matter and probably there is very little to choose between them.

The following table gives the 1930 and average yields:—

Carrot Variety Test, 1930, and Average Yields

Variety	Source	Number of years tested	Green yield per acre		Percentage dry matter		Dry matter per acre	
			1930	Average	1930	Average	1930	Average
			tons	tons	%	%	tons	tons
White Belgian	Hartmann	7	25·936	15·310	11·062	11·205	2·869	1·719
White Belgian	Dupuy and Ferguson	7	23·292	15·369	11·760	10·797	2·739	1·682
Improved Intermediate White	Ewing	7	25·932	16·591	10·225	9·975	2·651	1·671
Danish Champion	C.E.F.	7	21·424	14·966	11·465	10·918	2·456	1·643
Mammoth Short White	Rennie	7	26·023	15·989	10·175	9·996	2·648	1·611
Large White Belgian	Rennie	7	22·765	15·020	11·415	10·517	2·599	1·593
New Yellow Intermediate	Ewing	7	23·285	14·632	11·820	10·576	2·752	1·572
Large White Vosges	Dupuy and Ferguson	7	23·376	13·828	11·105	10·875	2·596	1·512
Mammoth White Intermediate	Rennie	6	26·533	18·292	10·837	9·984	2·875	1·844
White Belgian	Ewing	6	21·316	14·802	11·805	10·894	2·516	1·628
Champion	Hartmann	6	22·662	14·220	11·135	11·457	2·523	1·623
Yellow Belgian	Ewing	5	.....	13·542	.....	11·381	.....	1·548
James	D. L. F.	5	15·276	10·828	13·230	12·944	2·021	1·404
New Yellow Intermediate	Halifax Seed Co.	4	.....	10·108	.....	11·929	.....	1·220
Danish Champion	Hartmann	3	25·266	19·890	10·877	11·275	2·748	2·234
Champion	General Swedish Seed Co.	3	23·194	17·053	11·092	10·707	2·573	1·839
Half Long White	General Swedish Seed Co.	3	.....	12·987	.....	11·097	.....	1·474
White Belgian	Trifolium	2	.....	10·021	.....	11·123	.....	1·109
White Intermediate	Summerland	2	.....	11·189	.....	9·728	.....	1·095
Yellow Belgian	Dupuy and Ferguson	1	24,239	24,239	11·212	11·212	2·718	2·718
White Belgian 1207	Trifolium	1	.....	13·516	.....	14·070	.....	1·902
White Belgian 9008	Trifolium	1	.....	15·045	.....	11·210	.....	1·687
French White Belgian	Ewing	1	.....	13·953	.....	9·420	.....	1·314

ANNUAL HAYS

Seven varieties were tested in 1930. These were seeded on May 26 and harvested when they were one hundred per cent headed. The following table gives the results to date:—

ANNUAL HAYS

Variety	Number of years tested	Yield per acre			
		1930		Average	
		Green weight	Hay on 15 per cent moisture basis	Green weight	Hay on 15 per cent moisture basis
		tons	tons	tons	tons
Japanese	4	20·41	5·780	15·25	4·397
Golden	4	16·96	5·032	11·23	3·598
Hungarian	4	12·92	3·706	7·32	2·913
Siberian	4	14·00	3·939	7·32	2·910
Hog	4	16·24	3·849	9·38	2·870
Sudan Grass	3	9·03	2·143	7·17	1·942
Common	2	13·43	3·825	8·87	2·817

TEFF GRASS

Over a period of four years this annual grass has produced an average of 3·373 tons of hay per acre. When cut before it became too ripe and woody, it was readily eaten by live stock, but it lodged so badly that it could only be cut with a scythe and then only with great difficulty.

GRASSES AND CLOVERS

A number of experiments have been under way since 1922 comparing various grass and clover mixtures and grasses alone for hay and pasture purposes. The plots are one one hundredth acre in area with a one foot border which is removed at harvest time to eliminate border effect and are seeded in triplicate. Each seeding is left down until two hay cuttings are obtained.

The results show that grasses alone do not produce as heavy a yield as do grasses and clovers in combination, although timothy seems to be much more productive than either meadow fescue or orchard grass. It would appear that timothy is better suited for seeding with late than with early red clover. Timothy seeded with either late or early red clover has outyielded meadow fescue when sown in combination with the same clovers. From a standpoint of increased hay production there seems to be little to be gained by adding other grasses to the standard mixture of red clover, alsike clover and timothy, although in one or two instances the addition of meadow fescue has resulted in a small increase.

The results of these experiments are tabulated in the following tables:—

EXPERIMENT 7.—GRASSES WITH CLOVERS AND ALONE

Seed mixtures	Average of four first year cuttings		Average of four second year cuttings		Average of four first and four second year cuttings		
	Green weight per acre	Dry matter per acre	Green weight per acre	Dry matter per acre	Green weight per acre	Dry matter per acre	Hay on 15 per cent moisture basis
	tons	tons	tons	tons	tons	tons	tons
10 pounds red clover, 8 pounds timothy	9·748	2·802	6·154	2·232	7·951	2·517	2·961
10 pounds red clover, 15 pounds meadow fescue	7·883	2·351	5·349	2·010	6·616	2·181	2·565
10 pounds red clover, 15 pounds orchard grass	8·004	2·038	5·094*	1·863*	6·549†	1·951†	2·295†
10 pounds red clover, 6 pounds timothy, 10 pounds meadow fescue	8·655	2·488	5·459	2·062	7·057	2·275	2·677
10 pounds red clover, 6 pounds timothy, 10 pounds orchard grass	8·413	2·358	4·458	1·669	6·435	2·013	2·368
10 pounds red clover, 10 pounds meadow fescue, 10 pounds orchard grass	8·010	2·248	3·816	1·280	5·913	1·764	2·076
6 pounds alsike, 8 pounds timothy	9·187	2·642	5·118	2·068	7·153	2·355	2·770
6 pounds alsike, 15 pounds meadow fescue	8·453	2·508	4·421	1·684	6·437	2·096	2·466
6 pounds alsike, 15 pounds orchard grass	7·724	2·059	3·713*	1·454*	5·718†	1·757†	2·067
6 pounds alsike, 6 pounds timothy, 10 pounds meadow fescue	8·992	2·689	4·400	1·793	6·696	2·241	2·637
6 pounds alsike, 6 pounds timothy, 10 pounds orchard grass	7·797	2·361	3·550	1·419	5·673	1·890	2·223
6 pounds alsike, 10 pounds meadow fescue, 10 pounds orchard grass	7·607	2·297	3·176	1·251	5·392	1·774	2·087
8 pounds red clover, 2 pounds alsike, 8 pounds timothy	10·008	3·021	5·686	2·051	7·847	2·536	2·984
8 pounds red clover, 2 pounds alsike, 15 pounds meadow fescue	8·698	2·608	4·202	1·456	6·450	2·032	2·391
8 pounds red clover, 2 pounds alsike, 15 pounds orchard grass	8·010	2·103	3·942*	1·287*	5·976†	1·695†	1·994†
8 pounds red clover, 2 pounds alsike, 6 pounds timothy, 10 pounds meadow fescue	8·958	2·558	5·336*	1·985*	7·147†	2·272†	2·673†
8 pounds red clover, 2 pounds alsike, 6 pounds timothy, 10 pounds orchard grass	9·502	2·728	5·404	1·950	7·453	2·339	2·751
8 pounds red clover, 2 pounds alsike, 10 pounds meadow fescue, 10 pounds orchard grass	9·460	2·622	4·250	1·422	6·855	2·022	2·379
12 pounds timothy	5·821	2·215	4·130	1·606	4·975	1·911	2·248
30 pounds meadow fescue	4·620	1·768	3·010	1·148	3·815	1·458	1·715
30 pounds orchard grass	3·376	1·153	2·541*	0·996*	2·958†	1·075†	1·265†
8 pounds timothy, 15 pounds meadow fescue	4·277*	1·749*	3·454	1·388	3·840†	1·569†	1·845†
8 pounds timothy, 15 pounds orchard grass	3·754*	1·338*	2·800	1·019	3·277†	1·179†	1·387†
15 pounds meadow fescue, 15 pounds orchard grass	4·195	1·511	2·407	0·842	3·301	1·177	1·384

*Three years only. †Average of seven cuttings only.

EXPERIMENT 8.—RATES OF SEEDING HAY AND PASTURE MIXTURES

Seed mixtures	Average of four first year cuttings		Average of four second year cuttings		Average of four first and four second year cuttings		
	Green weight per acre	Dry matter per acre	Green weight per acre	Dry matter per acre	Green weight per acre	Dry matter per acre	Hay on 15 per cent moisture basis
	tons	tons	tons	tons	tons	tons	tons
10 pounds red clover, 8 pounds timothy	9·675	2·988	5·339	2·130	7·507	2·559	3·011
8 pounds red clover, 8 pounds timothy, 2 pounds alsike	10·436	3·034	5·324	2·112	7·880	2·573	3·027
5 pounds red clover, 8 pounds timothy, 5 pounds alsike	10·404	3·347	5·491	2·207	7·947	2·777	3·267
8 pounds red clover, 6 pounds timothy, 2 pounds alsike, 2 pounds red top	10·360	3·063	5·512	2·205	7·936	2·634	3·099
8 pounds red clover, 4 pounds timothy, 2 pounds alsike, 4 pounds red top	10·350	3·169	5·707	2·219	8·028	2·694	3·170
8 pounds red clover, 6 pounds timothy, 2 pounds alsike, 2 pounds red top, 6 pounds meadow fescue	10·657	3·053	5·653	2·265	8·155	2·659	3·128
8 pounds red clover, 4 pounds timothy, 2 pounds alsike, 4 pounds red top, 6 pounds meadow fescue	10·450	3·054	5·499	2·122	7·974	2·588	3·045

EXPERIMENT 10.—EARLY AND LATE RED CLOVER WITH EARLY AND LATE GRASSES

Seed mixtures	Average of three first year cuttings		Average of three second year cuttings		Average of three first and three second year cuttings		
	Green weight per acre	Dry matter per acre	Green weight per acre	Dry matter per acre	Green weight per acre	Dry matter per acre	Hay on 15 per cent moisture basis
	tons	tons	tons	tons	tons	tons	tons
10 pounds early red clover, 8 pounds timothy	11·085	3·347	6·105	2·332	8·595	2·839	3·340
10 pounds early red clover, 15 pounds meadow fescue	10·926	3·244	5·060	1·802	7·993	2·523	2·968
10 pounds late red clover, 8 pounds timothy	12·509	3·622	6·256	2·264	9·382	2·943	3·462
10 pounds late red clover, 15 pounds meadow fescue	11·304	3·089	5·619	1·984	8·462	2·536	2·984

EXPERIMENT 11.—MEADOW FESCUE IN HAY AND PASTURE MIXTURES

Seed mixtures	Average of four first year cuttings		Average of four second year cuttings		Average of four first and four second year cuttings		
	Green weight per acre	Dry matter per acre	Green weight per acre	Dry matter per acre	Green weight per acre	Dry matter per acre	Hay on 15 per cent moisture basis
	tons	tons	tons	tons	tons	tons	tons
8 pounds red clover, 2 pounds alsike, 8 pounds timothy	8·709	2·666	5·380	2·191	7·045	2·429	2·857
8 pounds red clover, 2 pounds alsike, 7 pounds timothy, 2 pounds meadow fescue	8·961	2·899	5·350	2·208	7·156	2·554	3·004
8 pounds red clover, 2 pounds alsike, 7 pounds timothy, 4 pounds meadow fescie	9·213	2·900	5·349	2·237	7·281	2·568	3·021
8 pounds red clover, 2 pounds alsike, 7 pounds timothy, 6 pounds meadow fescue	9·681	3·156	5·388	2·205	7·534	2·680	3·153
8 pounds red clover, 2 pounds alsike, 6 pounds timothy, 2 pounds meadow fescue	9·734	3·002	5·129	2·062	7·431	2·532	2·979
8 pounds red clover, 2 pounds alsike, 6 pounds timothy, 4 pounds meadow fescue	9·182	2·844	5·254	2·143	7·218	2·493	2·933
8 pounds red clover, 2 pounds alsike, 6 pounds timothy, 6 pounds meadow fescue	8·481	2·736	4·884	1·925	6·682	2·331	2·742

Timothy

The following table gives the results of the timothy variety test. As the varieties have not been carried in the same years, it is rather difficult to make any comparisons:—

Timothy Variety Test

Variety	Number of years tested	Average yield per acre		
		Green weight	Per cent dry matter	Hay on 15 per cent moisture basis
		tons		tons
Nova Scotia Commercial	6	4·674	40·814	2·189
Huron Ohio 3937	6	4·496	40·557	2·118
Boon	4	4·187	37·060	1·814
Ohio 9352	2	4·425	52·050	2·580
Ohio 6779	2	4·305	50·975	2·558
Ohio Commercial	2	3·930	52·490	2·501
Grande Prairie	2	4·080	51·905	2·443
Ottawa BK 1921	2	3·800	50·360	2·230

PERENNIAL HAYS

Red Clover Strain Test

Twenty-two regional strains of red clover have been tested for from one to three years. In 1923 four Southern European lots averaged 1·91 tons of cured hay per acre in comparison with five Canadian and one Swedish lot which averaged 2·60 tons per acre. Three Canadian and two Swedish Mammoth Red lots averaged 3·50 ton per acre, or an average of all northern grown lots both common and mammoth of 3·05 tons per acre. In 1927 five Southern European lots averaged 0·98 ton per acre, while six Canadian and three Swedish lots averaged 3·13 ton per acre. In 1929, five Southern European lots gave an average yield of 1·95 tons per acre in comparison with a yield of 3·16 tons from six Canadian and three Swedish lots.

Over the three year period all the Southern European lots averaged 1·59 tons per acre, while all of the northern grown lots, Canadian and Swedish, averaged 3·09 tons.

These data indicate clearly the superiority of northern grown red clover seed for conditions as they exist here. The following table gives the results to date:—

RED CLOVER STRAIN TEST

Regional strain	Number of years tested	Average yield per acre		
		Green weight	Per cent dry matter	Hay on 15 per cent moisture basis
		tons	%	tons
Altaswede	3	14·048	22·089	3·598
Late Swedish	3	13·878	21·594	3·444
Early Swedish	3	12·256	24·606	3·372
Medium Late Swedish	3	12·050	23·239	3·123
C.E.F. Ottawa	3	10·434	27·895	3·090
St. Clet	3	9·465	27·469	2·673
Kenora	3	10·074	22·122	2·544
Dauphine	2	14·150	23·330	3·553
Chateauguay	2	11·900	24·725	3·068
Sicily	2	6·141	25·099	1·704
Emelia	2	6·100	24·275	1·618
Veneto	2	4·958	26·177	1·367
Romagna	2	5·000	25·113	1·325
Umbria	2	4·791	25·317	1·305
Late Altaswede	1	14·200	24,360	4·069
France 500	1	7·000	31·910	2·628
France 533	1	6·900	31·280	2·539
Ottawa 1917-20	1	6·240	33·730	2·476
Ottawa 1916-20	1	5,820	33·110	2·267
St. Casemir	1	5·800	32·140	2·193
France 535	1	5·300	32·050	1·998
Italy 536	1	1·420	28·790	0·481

WHITE OR DUTCH CLOVER STRAIN TEST

Seven regional strains of White or Dutch Clover have been tested for from one to three years. As will be noted from the following table, no one strain has shown marked superiority.

WHITE OR DUTCH CLOVER STRAIN TEST

Regional strain	Number of years tested	Average yield per acre		
		Green weight	Per cent dry matter	Hay on 15 per cent moisture basis
		tons	%	tons
Kentish or Wild English	3	7·063	18·227	1·488
Danish Stryno	3	8·220	15·590	1·458
Danish Morso	3	6·856	18·260	1·425
Commercial	3	5·765	19·728	1·321
Ladino	2	7·153	15·071	1·182
Scottish	1	6·780	24·840	1·786
Mammoth	1	10·183	11·258	1·349

ALFALFA

Methods of seeding alfalfa have been investigated and while no very definite results have been recorded, the indications are that it is better to seed without a nurse crop. Seeded in rows twelve inches apart seems to be somewhat superior

to seeding broadcast when the rates of seeding were ten and twenty pounds per acre respectively, although the hay is coarser and not as palatable to live stock. Hay from the broadcast seeding is finer in the stem and of better quality. Excellent stands have been obtained the first year, but considerable winter-killing has occurred during either the first or second winter.

SUGAR BEETS

Three varieties approved for factory purposes were on trial in 1930. The analysis for sugar content and co-efficient of purity, was made by the Division of Chemistry at Ottawa. The following table gives the results:—

VARIETY TEST OF SUGAR BEETS

Variety	Yield per acre	Sugar in juice	Coefficient of purity
	tons	%	%
Dieppe	15·97	20·78	89·86
Fredericksen	15·20	20·01	90·22
Rabbethege and Giesecke	14·90	20·65	91·85

SWEDE SEED PRODUCTION

The production of Bangholm club-root resistant swede seed was continued. The seed roots were badly damaged by heating and rotting in the pit, with the result that there were very few roots with undamaged crowns available for planting. This, together with a very dry summer, resulted in a very poor growth of tops and a correspondingly low production of seed. Only 190 pounds of seed were harvested, all of which has been sold and at the time of writing many orders have been returned unfilled. Two hundred and ninety bushels of roots were pitted for seed purposes in 1931.

CHEMISTRY

The experimental work with fertilizers was continued in 1930. The results of two experiments are given herein, while the results of others are being withheld until more data are available.

FERTILIZER FORMULAE FOR POTATOES

Seven years results with various fertilizer formulae for potatoes in a three-year rotation of potatoes, oats and clover hay are reported. The full cost of the fertilizer is charged against the potato crop alone. The results indicate that a formula medium in nitrogen and medium to high in phosphoric acid and potash will give the best results under conditions as they existed in this experiment. The soil is a medium clay loam, with a heavy clay subsoil, having a gentle slope towards the west. The following table gives the results to date:—

FERTILIER FORMULAE FOR POTATOES, 1930

Formulae		6-6-6			5-6-6			4-6-6-			3-6-6			5-8-6		
Application per acre in pounds		1,000	1,500	2,000	1,000	1,500	2,000	1,000	1,500	2,000	1,000	1,500	2,000	1,000	1,500	2,000
Average yield per acre—																
Marketable	bush.	136·0	159·0	160·2	99·0	134·3	155·8	119·3	126·0	148·7	121·0	182·0	202·2	136·7	151·7	196·7
Unmarketable	"	46·7	46·7	51·1	57·7	50·0	55·5	57·1	56·0	61·0	55·3	55·3	54·0	57·3	64·0	48·9
Increase over average of checks—																
Marketable	bush.	87·7	110·7	111·9	50·7	86·0	107·5	71·0	77·7	100·4	72·7	133·7	153·9	88·4	103·4	148·4
Unmarketable	"	8·0	8·0	12·4	19·0	11·3	16·8	18·4	17·3	22·3	16·6	16·6	15·3	18·6	25·3	10·2
Value of increase	$	36 68	45 88	47 24	24 08	36 66	46 36	32 08	34 54	44 62	32 40	56 80	64 62	39 08	46 42	61 40
Cost of fertilizer	$	15 42	23 14	30 85	13 80	20 71	27 61	12 32	18 48	24 64	10 76	16 15	21 53	14 96	22 44	29 92
Profit over cost of fertilizer	$	21 26	22 74	16 39	10 28	15 95	-18 75	19 76	16 06	19 98	21 64	40 65	43 09	24 12	23 98	31 48
Average profit of applications	$	.....	20 13	.....	.....	14 99	.....	.....	18 60	.....	.....	35 13	.....	.....	26 53	.....
Seven year average profit	$	21 58	20 07	16 67	21 10	26 61	24 21	25 14	34 45	36 37	33 03	31 52	39 04	29 37	23 55	28 41
Seven year average profit of applications from the three rates	$	.....	19 44	.....	.....	23 97	.....	.....	31 99	.....	.....	34 53	.....	.....	27 11	.....

Formulae		4-8-6			3-8-6			4-8-10			4-8-8			4-8-4		
Application per acre in pounds		1,000	1,500	2,000	1,000	1,500	2,000	1,000	1,500	2,000	1,000	1,500	2,000	1,000	1,500	2,000
Average yield per acre—																
Marketable	bush.	164·7	174·3	172·0	133·1	120·0	184·5	170·2	159·3	189·7	160·3	161·7	209·3	90·7	185·3	170·3
Unmarketable	"	55·3	52·0	59·0	51·1	69·0	53·8	47·8	57·5	58·7	62·0	57·0	49·3	53·3	57·7	63·7
Increase over average of checks—																
Marketable	bush.	116·4	126·0	123·7	84·8	71·7	136·2	121·9	111·0	141·4	112·0	113·4	161·0	42·4	137·0	122·0
Unmarketable	"	16·6	13·3	20·3	12·4	30·3	15·1	9·1	18·8	20·0	23·3	18·3	10·6	14·6	19·0	25·0
Value of increase	$	49 88	53 06	53 54	36 40	34 74	57 50	50 58	48 16	60 56	49 46	49 02	66 52	19 88	58 60	53 80
Cost of fertilizer	$	13 47	20 21	26 95	11 92	17 88	23 84	15 23	22 85	30 47	14 35	21 53	28 71	12 59	18 89	25 19
Profit over cost of fertilizer	$	36 41	32 85	26 59	24 48	16 86	33 66	35 35	25 31	30 09	35 11	27 49	37 81	7 29	39 71	28 61
Average profit of applications	$	.....	31 95	.....	.....	25 00	.....	.....	30 25	.....	.....	33 47	.....	.....	25 20	.....
Seven year average profit	$	28 77	32 20	27 87	31 43	29 67	38 64	34 36	37 97	36 75	29 60	39 94	38 42	23 84	30 51	27 01
Seven year average profit of applications from the three rates	$	.....	29 61	.....	.....	33 25	.....	.....	36 36	.....	.....	35 99	.....	.....	27 12	.....

Prices used:—

Nitrate of soda per ton	$ 54 00
Sulphate of ammonia, per ton	54 00
Superphosphate, per ton	18 50
Muriate of potash, per ton	44 00
Marketable potatoes, per bushel	40 cents
Unmarketable potatoes, per bushel	20 "

Average yield of check plots—

Marketable	48·3 bushels per acre
Unmarketable	38·7 "

Sources of Phosphoric acid

As several of the brands of slag originally used in this experiment have been taken off the market, one brand of Sydney slag was used on all plots that heretofore had received Sydney slag and Belgian slag has replaced English slag. A crop of swedes was grown in 1927 in an attempt to overcome any residual effects of the phosphoric acid previously used in this experiment and then a crop of oats grown in 1928 before any fertilizer was applied. An inspection of the following table will show that results indicate there was more residual effect from the English and Belgian slags as expressed in the oat yields of 1928, all English and Belgian slag plots having been grouped as was explained above. Due to the fact that the fertilizers were not applied until after the oat crop was harvested, only the value of increase for the two hay crops was figured. No fertilizer costs have been given, as these costs vary considerably in different localities and it is better to allow the reader to apply such prices as the fertilizers would cost him and so arrive at his own conclusions. A $10 per ton value for hay is only an arbitrary figure and might also have to be changed for different localities.

The following table gives the results of one rotation, the rotation being a three-year one of oats, hay and hay:—

Sources of Phosphoric Acid

Treatment, Nature of fertilizer	Rate per acre	1928, oats				1929, hay		1930, hay		Value of hay increase at $10 per ton
		Yield per acre		Gain or loss over checks		Yield per acre	Gain or loss over checks	Yield per acre	Gain or loss over checks	
		Grain	Straw	Grain	Straw					
	lb.	bush.	tons	bush.	tons	tons	tons	tons	tons	$
Sydney slag XX	1,000	18·92	0·43	1·38	0·04	1·23	0·31	1·214	0·210	5 20
Sydney slag XX	500	18·51	0·41	0·97	0·02	1·07	0·15	1·116	0·112	2 62
Belgian slag	875	25·29	0·52	7·75	0·13	1·28	0·36	1·426	0·422	7 82
Belgian slag	437	22·85	0·44	5·31	0·05	1·11	0·19	1·195	0·191	3 81
Ground natural rock phosphate	1,000	17·38	0·36	−0·16	−0·03	1·08	0·16	1·342	0·338	4 98
Ground natural rock phosphate	500	18·00	0·40	0·46	0·01	0·86	−0·06	0·991	−0·013	−0 73
Ground natural rock phosphate	250	17·18	0·36	−0·36	−0·03	0·78	−0·14	1·015	0·011	−1 29
Superphosphate	875	16·91	0·40	−0·63	0·01	1·75	0·83	1·582	0·578	14 08
Superphosphate	437	16·21	0·33	−1·33	−0·06	1·61	0·69	1·246	0·242	9 32
Ground limestone Superphosphate	4,000 437	17·62	0·36	0·08	−0·03	1·67	0·75	1·734	0·730	14 80
Checks	.....	17·54	0·39	.....	.....	0·92	.....	1·004	.....	.....

The fertilizer was not applied until after the oat crop was harvested, so that no account was taken of the oat yields when figuring the value of increase due to the application of fertilizer.

POULTRY

THE SEASON

When the birds were placed in the winter quarters during the first two weeks of October, the weather was fairly mild and although it gradually became colder, there were no very sudden changes or extremes in temperature until January 5. The production gradually increased up to January 5, reaching 52 per cent. On January 5 the temperature dropped to 3° below zero and on the following day 5° below; two days later it rose to 52° above and three days later the mercury dropped to zero and continued on down to 25° below the following day. The birds dropped 3 per cent in production and did not get back to their usual stride until the following week. Even though the mercury fell below zero on nine dates during the balance of January, the birds continued to make a gradual increase, reaching 55 per cent before the end of the month. This work was well maintained throughout February. From then on the birds increased their production, reaching a maximum of 66·6 per cent the first week in May. The production remained around this level until the first week in July. Then

production gradually dropped to 17 per cent the final week of October the 23rd, 1930. It is the sudden and extreme changes in temperature which affect the production program to the greatest degree. Therefore the poultry house should be located and built in such a manner that the birds will feel these sudden changes as little as possible.

Pedigree Breeding

Too much emphasis cannot be placed on the importance of selecting the breeding stock. Bred-to-lay females are essential in economic production. Pedigree breeding will not only facilitate the breeding work on the plant, but it will insure the work to a very marked degree. Females up to the standard of the qualifications of the breed they represent, laying 200 eggs or more, weighing 24 ounces per dozen, should be the objective of each breeder.

At the Experimental Farm, Nappan, N.S., the number of matings made during the breeding season was 236; of these, 16 were registered females mated to registered males.

Summary of Birds Laying Over 150 Eggs

Year	Number of birds	Average egg production	Number of birds	Average egg production	Number of birds	Average egg production
1919–20	6	208·3	4	184·0	17	159·8
1920–21	11	218·0	13	187·1	16	164·3
1921–22	16	218·9	8	181·4	14	159·3
1922–23	8	275·0	19	223·3	14	174·1
1923–24	3	281·0	23	226·5	46	170·7
1924–25	4	208·0	6	184·0	6	162·2
1925–26	3	204·0	13	183·0	10	161·1
1926–27	3	269·0	17	218·2	31	173·8
1927–28	7	274·5	42	218·7	68	176·4
1928–29	7	263·4	48	202·6	68	162·7
1929–30	6	267·5	40	221·6	39	176·6

The preceding table shows a marked improvement in the production records over the previous years.

Feeding Experiments

The good feeder is always studying the feeding problems as they arise each year. By adjusting his mixtures and grain to the trend of their feeding value, he frequently is able to lower the unit cost of production. He also studies the birds' requirements and, meeting these food requirements, is able to convert a non-profitable flock into a profitable one. It is well to sometimes ask yourself this question: Are those birds receiving all the ingredients necessary to enable them to maintain their bodies and produce eggs?

Each year more information is being published by the different Experimental Farms and colleges on the results obtained from various feeding mixtures and some very interesting results are made available to the interested breeder and feeder.

The following projects were continued at Nappan during 1930: Epsom salts versus mangels versus clover versus sprouted oats as green feeds; beef scrap versus fish meal as a source of animal protein; oyster shell versus clam shell versus gypsum as grit and mineral feeds; light versus heavy feeding for egg production, also hatchability and livability of chicks; home grown versus commercial feeds for raising pullets.

The following table gives the five-year average results of the trials testing various feeds for green feed and substitutes for green feed:—

MANGELS VS. EPSOM SALTS VS. SPROUTED OATS VS. CLOVER—5-YEAR AVERAGES, 1926-30

—		Mangels	Epsom salts	Sprouted oats	Clover
Number of days in experiment	No.	181·8	181·8	181·8	181·8
Number of bird days in experiment	"	2,520·8	2,508·4	2,524·4	2,525·8
Number of birds on experiment	"	13·8	13·7	13·8	13·8
Scratch grain consumed	lb.	466·20	477·00	470·60	481·80
Mash consumed	"	147·30	150·50	139·30	167·70
Beef scrap consumed	"	23·20	28·90	24·60	30·10
Mangels consumed	"	472·90	.....	.....	.....
Epsom salts consumed	"	.....	9·58	.....	.....
Sprouted oats consumed	"	.....	.....	142·60	.....
Clover consumed	"	.....	.....	.....	95·50
Grit consumed	"	10·65	8·60	9·60	10·80
Shell consumed	"	24·00	22·95	25·75	26·30
Eggs laid	No.	1,132·2	1,113·80	1,160·00	1,151·40
Statement of Cost					
Scratch grain	$	11 880	12 148	11 986	12 280
Mash	$	4 016	4 098	3 820	4 544
Beef scrap	$	1 060	1 352	1 088	1 480
Mangels	$	1 242	.....	.....	.....
Epsom salts	$	.....	0 450	.....	.....
Sprouted oats	$	.....	.....	3 380	.....
Clover	$	.....	.....	.....	0 374
Grit	$	0 186	0 146	0 164	0 190
Shell	$	0 432	0 412	0 456	0 472
Total cost of feed	$	18 816	18 606	20 894	19 340
Total value of eggs	$	37 408	37 018	39 224	38 296
Profit over feed	$	18 592	18 412	18 330	18 956
Feed cost per dozen	cts.	19·07	19·95	21·61	20·15
Profit per bird	$	1 347	1 345	1 328	1 369

The results obtained from these feeding trials have been very consistent from year to year. There has not been any significant difference in egg production. The cost of sprouted oats brings the feed cost up slightly over clover, Epsom salts and mangels and there is a very slight difference in the other three, mangels showing the lowest unit cost per dozen of eggs produced.

Mineral Feeds

The following table gives the average results of the experiment, Oyster Shell and Grit versus Clam Shell and Grit versus Gypsum:—

Oyster Shell and Grit vs. Clam Shell and Grit vs. Gypsum—5-Year Averages, 1926-30

—		Oyster shell and grit	Clam shell and grit	Gypsum
Number of days in experiment	No.	181·8	181·8	181·8
Number of bird days in experiment	"	2,449·8	2,446·4	2,377·8
Number of birds on experiment	"	13·4	13·4	13·0
Scratch grain consumed	lb.	487·40	474·20	465·60
Mash consumed	"	146·70	140·40	132·70
Beef scrap consumed	"	29·50	24·20	48·70
Oyster shell consumed	"	24·90	.....	.....
Grit consumed	"	8·70	9·75	.....
Clam shell consumed	"	.....	26·70	.....
Gypsum consumed	"	.....	.....	55·85
Roots consumed	"	357·70	357·70	357·70
Clover consumed	"	3·20	3·20	3·20
Eggs laid during experiment	No.	1,042·40	1,015·80	794·40
Statement of Cost				
Scratch grain	$	12 420	12 080	11 868
Mash	$	3 970	3 832	3 606
Beef scrap	$	1 380	1 104	2 038
Oyster shell	$	0 442	.....	.....
Grit	$	0 152	0 174	.....
Clam shell	$	.....	0 380	.....
Gypsum	$	.....	.....	1 118
Roots	$	0 936	0 936	0 936
Clover	$	0 012	0 012	0 012
Total cost of feed	$	19 312	18 518	19 848
Value of eggs laid	$	33 928	33 824	26 422
Profit over feed	$	14 616	15 306	6 574
Feed cost per dozen	cts.	22·23	21·87	29·98
Profit per bird	$	1 09	1 142	0 505

The data reveal very little difference between oyster shell and clam shell. Both oyster and clam shell gave slightly better results than gypsum.

Protein Feeds

The following table gives the five year's results of the feeding trial on fish meal versus beef scrap for poultry:—

Beef Meal vs. Fish Meal—5-Year Averages, 1926-30

—		Beef meal	Fasterfat fish meal
Number of days in experiment	No.	181·8	181·8
Number of bird days in the experiment	"	2,461·4	2,424·6
Number of birds on the experiment	"	12·9	13·3
Scratch grain consumed	lb.	464·20	476·00
Mash consumed	"	114·92	126·50
Beef scrap	"	35·80	.....
Fasterfat fish meal consumed	"	.....	22·10
Grit consumed	"	9·05	9·50
Shell consumed	"	27·15	27·60
Roots consumed	"	368·50	368·50
Clover consumed	S	3·20	3·20
Eggs laid during the experiment	No.	1,096·8	1,117·40
Statement of Cost			
Scratch grain	$	11 824	12 122
Mash	$	2 542	2 830
Beef scrap	$	1 596	.....
Fasterfat fish meal	$	.....	0 848
Grit	$	0 158	0 164
Shell	$	0 478	0 494
Roots	$	0 954	0 954
Clover	$	0 012	0 012
Total cost of feed	$	17 564	17 424
Total value of eggs	$	36 576	36 690
Profit over feed	$	19 012	19 266
Feed cost per dozen	cts.	19·21	18·71
Profit per bird	$	1 473	1 448

The production per bird was slightly higher in the case of the beef scrap, but not sufficient to be significant. The fish meal shows a slightly lower unit feed cost, even though the production per unit was lower.

Home Grown versus Commercial Feeds

The following table gives the results of a feeding trial where one group of pullets was raised from birth to maturity on home-grown mixtures, while the second group was raised on commercial feeds.

From November 1 to April 30 the respective groups were fed for egg production on home-grown versus commercial feeds.

RESULTS WITH HOME GROWN VS. COMMERCIAL FEEDS

Item		Home	Commercial
Number of days in experiment	No.	181	181
Number of bird days in experiment	"	2,172	2,172
Number of birds on experiment	"	12	12
Scratch grain (home) consumed	lb.	370	.....
Scratch grain (commercial) consumed	"	.....	407
Mash (home) consumed	"	142	.....
Mash (commercial) consumed	"	.....	146
Beef scrap consumed	"	60	.....
Grit consumed	"	5	7¾
Oyster shell consumed	"	18¾	21
Mangels consumed	"	291½	291½
Total eggs laid	No.	975	865
Statement of Cost			
Scratch grain (home) at $2.50 per cwt	$	9 25	.....
Scratch grain (commercial) at $3.15 per cwt	$	.....	12 82
Mash (home) at $2.98 per cwt	$	4 23	.....
Mash (commercial) at $3.75 per cwt	$	.....	5 48
Beef scrap at $4.375 per cwt	$	2 63	.....
Grit at $2 per cwt	$	0 10	0 16
Shell at $1.60 per cwt	$	0 32	0 34
Mangels at 30 cents per cwt	$	0 87	0 87
Total cost of feed	$	17 40	19 67
Total value of eggs laid	$	26 84	25 35
Profit per pen over feed	$	9 44	5 68
Feed cost per dozen	cts.	21·4	27·2
Profit per bird	$	0 79	0 47

The results for one year point most favourably towards home-grown mixtures, but definite deductions cannot be made on one year's trial. The point that is worth keeping in mind is the fact that home-grown feeds may economically be grown and marketed through the eggs.

COSTS OF PRODUCTION

The production cost is given in the following table per month for the Barred Rock pullets kept at this Farm for the year 1929-30:—

MONTHLY PRODUCTION COST, BARRED ROCK PULLETS, 1929-30

Month	Number of bird days	Total eggs laid	Market value	Total feed cost	Feed cost per dozen	Profit over feed cost	Feed cost per bird per day
			$	$	cts.	$	$
1929							
November	5,971	1,784	52 33	52 64	35·4	—0 31	0·00881
December	6,511	1,993	71 08	59 53	35·8	11 55	0 00914
1930							
January	6,541	3,191	114 34	61 75	23·5	52 59	0 00944
February	7,236	2,920	102 20	57 98	23·8	44 22	0 00801
March	7,153	4,093	98·91	51·08	14·9	47 83	0 00714
April	5,184	3,018	55 33	38 48	15·3	16 85	0 00742
May	4,728	3,082	61 64	27 35	13·2	34 29	0 00578
June	3,584	2,486	51 79	29 17	14·0	22 62	0 00813
July	2,462	1,482	30 88	15 29	12·3	15 59	0 00621
August	2,138	1,225	26 54	14 03	13·7	12 51	0 00656
September	1,956	898	19 46	12 72	16·9	6 74	0 00650
October	1,873	612	18 87	11 41	22·3	7 46	0 00609
	55,337	26,784	703 37	431 43	19·3	271 94	.....

Average birds for year, 151·6.
Average eggs per bird, 176·6.
Cost of feed per bird per day, $0·00779.
Feed cost per year per bird, $2.84.
Profit per bird over feed cost, $1.79.

The figures compiled in the above table are based on bird days. The average number of birds for the year was 151·6, based on bird days, and the average production was 176·6 eggs. The average daily feed cost was $0·00779 or $2.84 per annum. The profit over feed cost was $1.79 per bird.

It is always interesting to compare the pullets with the hens. Therefore the production feed cost for the Barred Rock hens is submitted in the following table per month:—

MONTHLY PRODUCTION COST, BARRED ROCK HENS USED AS BREEDING STOCK, 1929-30

Month	Number of bird days	Total eggs laid	Market value	Total cost of feed	Feed cost per dozen	Profit over feed cost	Feed cost per bird per day
1929			$	$	$	$	$
November.....	5,318	368	17 63	32 85	1 07	−15 22	0 00617
December.....	5,354	276	13 46	34 42	1 13	−20 96	0 00642
1930							
January.....	5,280	898	36 67	36 23	0 48	0 44	0 00686
February.....	4,730	1,224	44 37	36 46	0·357	7 91	0 00770
March.....	4,834	2,210	65 20	39 77	0 211	25 43	0 00822
April.....	3,940	2,671	55 65	33 49	0 150	22 16	0 00850
May.....	3,705	2,396	51 91	27 70	0 138	24 21	0 00747
June.....	2,983	1,147	26 29	14 67	0 153	11 62	0 00496
July.....	2,201	970	21 83	12 01	0 148	9 82	0 00546
August.....	2,120	1,019	25 48	13 05	0 153	12 43	0 00615
September.....	1,980	846	24 68	11 55	0 163	13 13	0 00583
October.....	1,843	356	10 98	9 50	0 320	1 48	0 05154
	44,288	14,381	394 15	301 70	25·1 cts.	92 45	

Average number of birds for year, 121·3.
Average number eggs per bird, 118·5.
Cost of feed per bird per day $0·0068.
Feed cost per bird per year, $2.49.
Profit per bird over feed cost, 76 cents.

The preceding data are worked out in bird days, just the same as for the pullets. The average number of birds, based on bird days, was 121·3, with an average production of 118·5 at a daily feed cost of $0.0068, or $2.49 per annum. The profit over feed cost was 76 cents against $1.79 per bird in the case of the pullets. These figures indicate fairly conclusively that it does not pay to keep hens for egg production other than as breeders.

LIGHT VERSUS HEAVY RATIONS FOR BREEDING STOCK

A trial was started in 1929 in heavy versus light feeding of breeding stock. The pens receiving the light ration produced the most of their eggs during the last month, while the heavy fed birds produced fairly uniformly right from the beginning of the trial, which started on November 1 and ended on March 31.

The following table gives the two year's average results of the hatching and vitality of chicks hatched from the two lots:—

LIGHT VERSUS HEAVY RATION FOR HATCHING AND VITALITY OF CHICKS, 1929 AND 1930

Ration	Total eggs laid	Total eggs set	Number fertile	Per cent fertile	Number of chicks	Per cent total eggs hatched	Per cent fertile eggs hatched	Number of chicks alive when wing banded	Per cent chicks hatched alive when wing banded	Total eggs required for 1 chick hatched	Total fertile eggs for 1 chick hatched	Total eggs required for 1 chick when wing banded
Light.....	494·0	158·5	136·5	86·1	66·5	37·5	43·58	59·5	89·47	2·38	2·05	2·66
Heavy.....	470·5	126·0	94·5	75·0	24·5	14·28	19·0	18·0	73·46	5·14	3·85	7·00

While these figures are taken from only two years and cannot be taken as conclusive, they are, nevertheless, very interesting, inasmuch as the light fed birds appear to have given more satisfactory results on every count. This work will be continued.

The following is a statement of the cost of rearing chicks up to September 30, when they were put into winter quarters.

COST OF INCUBATION, 1930

Total eggs set, 2,928 at 27 cents per dozen		$ 65 88
Total oil used, 70¾ gallons at 24 cents per gallon		16 98
		$ 82 86
1,436 chicks hatched cost	$ 82 86	
1 chick hatched cost	5·77 cents	

COST OF BROODING

1,335 pounds of hard coal at $16.45 per ton	$ 10 98
888 pounds of soft coal at $6.70 per ton	2 92
286 pounds of coke at $11 per ton	1 57
1,000 pounds Full-O-Pep starting mash at $4.65 per cwt	46 50
535 pounds chick grain at $4.50 per cwt	18 73
103 pounds grit at $2 per cwt	2 06
230 pounds starting mash at $3 per cwt	6 90
948 pounds growing mash at $2.29 per cwt	21 72
290 pounds wheat at $2.25 per cwt	6 53
68 pounds sprouted oats at $2.09 per cwt	1 42
	$ 119 33
1,331 chicks alive at end of brooding period cost	$ 119 33
1 chick alive at end of brooding period cost	8·96 cents

RANGE COSTS JUNE 1, 1930, TO SEPTEMBER 30, 1930

3,000 pounds of scratch grain at $2.17 per cwt	$ 65 10
8,100 pounds of scratch grain at $1.98 per cwt	160 38
1,200 pounds of scratch grain at $2 per cwt	24 00
900 pounds Full-O-Pep growing grain at $3.25 per cwt	29 25
1,100 pounds Full-O-Pep scratch grain at $3 per cwt	33 00
6,660 pounds of mash at $2.43 per cwt	161 84
5,400 pounds of mash at $2.13 per cwt	115 02
2,000 pounds of corn meal at $2 per cwt	40 00
1,600 pounds of Full-O-Pep growing mash at $3.85 per cwt	61 60
100 pounds of beef meal at $4.12 per cwt	4 12
100 pounds of laying mash at $3.25 per cwt	3 25
40 pounds of grit at $1.50 per cwt	0 60
30 pounds of shell at $1.50 per cwt	0 45
	$ 698 61
Cost of 1,104 chickens on range at September 30	$ 698 61
Cost of 1 chick on range at September 30	60·5 cents

Summary

Cost of incubating 1,436 chicks		$ 83 86
Cost of brooding, 1,331 chicks		119 33
Cost of rearing 1,104 chicks		698 61
		$ 900 80
Total cost of 1,104 chicks raised	$ 900 80	
Total cost of 1 chick raised	81·59 cents	

AVERAGE COST FOR PAST NINE YEARS

Year	Total chicks at five months	Total cost	Average cost per chick
	No.	$	$
1922	719	436 58	0 61
1923	330	273 42	0 83
1924	207	274 32	1 33
1925	480	493 76	1 03
1926	366	575 63	1 57
1927	623	466 88	0 75
1928	1,067	800 80	0 75
1929	611	589 94	0 97
1930	1,104	900 80	0 82
	5,507	4,812 13	0 873

HATCHING RESULTS FOR 1930

Item	Total eggs set	Number fertile	Per cent fertile	Number of chicks	Per cent total eggs hatched	Per cent fertile eggs hatched	Number of chicks alive when wing banded	Per cent chicks alive when wing banded	Total eggs for one chick hatched	Total fertile eggs to one chick hatched	Total eggs for one chick alive when banded
1930 totals	2,380	1,979	83·2	1,209	50·8	61·1	1,159	95·9	1·96	1·6	2·1
Hens, 1930	1,950	1,657	84·9	1,041	53·4	62·8	996	95·7	1·9	1·6	1·95
Pullets, 1930	430	322	74·9	168	39·1	52·2	163	97·0	2·6	1·9	2·6
8-year average—											
Hens	1,673	1,247	74·53	522	30·6	42·6	428	81·8	3·2	2·38	3·90
Pullets	1,590	1,135	71·38	324	20·3	28·5	226	69·7	4·9	5·02	7·03
Buckeye, 1930	2,230	1,849	82·9	1,148	51·5	62·1	1,098	95·6	1·9	1·6	2·0
Prairie State, 1930	150	130	86·7	61	40·7	46·9	61	100·0	2·5	2·1	2·5
Buckeye—7-year average	2,542	1,808	71·12	684	26·9	37·8	582	85·08	3·7	2·6	4·36
Prairie State—6-year average	485	365	75·25	103	21·2	28·3	68	66·01	4·7	3·5	7·13
March, 1930	1,554	1,279	82·3	716	46·1	55·9	699	97·6	2·2	1·8	2·2
April, 1930	826	700	84·7	493	59·7	70·4	460	93·3	1·6	1·4	1·8
Averages—											
March, 6-year average	1,292	973	75·32	346	26·77	35·56	318	91·9	3·7	2·8	4·0
April, 7-year average	1,489	1,016	68·23	408	27·40	40·15	344	84·31	3·6	2·4	4·3
May, 4-year average	548	412	75·18	98	17·88	23·79	63	64·29	5·59	4·2	8·7

EGG-LAYING CONTEST

This Farm has just completed its eleventh year's results on contest work.

Twenty-four pens were entered in the 1929-30 contest. By provinces, the entries were as follows: Nova Scotia, 7; New Brunswick, 14; Prince Edward Island, 1; Quebec, 1; Ontario, 1.

The breeds were represented as follows:—Single Comb White Leghorns, 5; White Wyandottes, 2; Rhode Island Reds, 1; Barred Rock, 16.

Each entry consisted of 10 birds, with two additional birds designated as spares or substitutes. All birds must be free from standard disqualifications for the breed they represent and lay 200 eggs or more, weighing 24 ounces to the dozen after the first four weeks of laying before they are eligible for registration.

The standing of each pen is based on points. One point is allowed for each egg laid which weighs 2 ounces and a penalty of one-tenth point is deducted for each ounce that eggs average less than 24 ounces to the dozen. A bonus of one-tenth is added for each ounce the eggs average over 24 ounces to the dozen, up to 27 ounces. All eggs averaging less than 20 ounces, ill shaped or soft-shelled are not officially taken into account.

The registration work is now well established and those taking advantage of it in the early stages of the breeding work will have a very marked advantage over their fellow breeders.

The following table gives the names and addresses of each contestant. It also gives the breed, eggs laid and points recorded for each pen scored on egg weight for 1929-30 Contest.

RESULTS IN THE 1929-30 CONTEST

Pen No.	Owner and address	Breed	Eggs	Total points
8	Miss Ella Lindsay, Moore's Mills, N.B.	B.P.R.	2,432	2,494·9
22	C. D. Calder, Cowansville, P.Q.	S. C. W. L.	2,187	2,434·8
7	A. T. Reed, Rollingdam Sta., N.B.	B. P. R.	2,359	2,269·2
16	Experimental Farm, Nappan, N.S.	B. P. R.	2,059	2,165 1
9	G. M. Avard, Sackville, N.B.	B. P. R.	2,237	2,142·3
10	C. E. Gunter, Upper Gagetown, N.B.	B. P. R.	2,143	2,124·0
12	Mrs. O. A. Mitton, Riverside, N.B.	B. P. R.	2,094	2,027·0
23	Dunning's Poultry Farm, Navan, Ont.	S. C. W. L.	1,973	2,017·3
5	H. Bedford, St. Stephen, N.B.	B. P. R.	2,086	1,957·7
18	C. A. P. Johnstone, Dartmouth, N.S.	W. W.	1,722	1,920·8
3	R. Lever, Rollingdam Station, N.B.	B. P. R.	1,992	1,913·5
2	H. B. Smith, Hoyt Station, N.B.	B. P. R.	1,870	1,849·6
15	Experimental Farm, Nappan, N.S.	B. P. R.	1,731	1,839·6
1	S. R. Pendleton, Kensington, P.E.I.	B. P. R.	1,782	1,812·8
4	M. A. Maxwell, Moore's Mills, N.B.	B. P. R.	1,883	1,795·5
21	W. H. C. Chambre, Cody's, N.B.	S. C. W. L.	1,750	1,776·2
6	W. H. McGibbon, Moore's Mills, N.B.	B. P. R.	1,796	1,683·3
19	Experimental Station, Kentville, N.S.	S. C. W. L.	1,576	1,613·4
17	C. A. Brown, New Glasgow, N.S.	W. W.	1,418	1,553·8
14	Experimental Station, Kentville, N.S.	B. P. R.	1,634	1,545·1
20	W. C. Black, Amherst, N.S.	S. C. W. L.	1,522	1,495·4
13	W. N. Milner, Sackville, N.B.	B. P. R.	1,204	1,220·6
24	A. Pringle, Stanley, N.B.	R. C. B. L.	1,419	1,177·8
11	L. B. Jonston, Nashwaaksis, N.B.	B. P. R.	1,404	1,150·7

The 240 birds laid 44,273 eggs, or an average of 184·4 eggs per bird.

Number of birds laying 250 eggs or more	22
Number of birds laying 200 to 249 eggs	98
Number of birds laying 150 to 199 eggs	72
Number of birds laying less than 150 eggs	63
Number of birds registered	77
Number of birds disqualified because of small eggs	43

The feed cost to produce 44,273 eggs was $620.64, or $2.59 per bird and figures out to 16·8 cents per dozen eggs laid.

The actual market value of the 44,273 eggs was $1,146.72 or $4.779 per bird, with an average feed cost ranging around $2.159. This left a labour income over feed cost of $2.19 per bird, which is a very good showing, considering the low price of eggs.

The following table gives the results of the five pens showing the greatest profit over feed cost for the 51 weeks:—

Pen No.	Breed	Owner	Number of eggs	Value	Cost	Profit
				$	$	$
7	B. R.	A. T. Reed	2,359	62 73	27 20	35 53
8	B. R.	E. Lindsay	2,432	65 15	30 17	34 98
22	W. L.	C. D. Calder	2,187	57 89	26 77	31 12
9	B. R.	G. M. Avard	2,237	54 61	25 98	28 63
4	B. R.	M. A. Maxwell	1,883	49 14	21 07	28 07

The highest individual in the 1929-30 Contest was Barred Rock No. 82, owned by Miss Ella Lindsay of Moore's Mills, with a production of 280 eggs, scoring 306·2 points. The second bird was Barred Rock No. 94, owned by G. M. Avard, Sackville, N.B., with a production of 261 eggs, scoring 305·8 points. The third bird was another Barred Rock in Miss Lindsay's pen, No. 84, with 244 eggs and 286·7 points.

CONTEST SUMMARIES

Year	Number of birds	Average egg production
1919-20	100	121·1
1920-21	220	127·8
1921-22	200	138·3
1922-23	200	143·3
1923-24	200	176·9
1924-25	240	165·5
1925-26	270	156·5
1926-27	210	170·7
1927-28	190	162·4
1928-29	220	170·6
1929-30	240	184·4

FEEDING

In a few words the following gives feed mixtures and methods of feeding:—

Grain from November 1, 1929, to June 11, 1930: Oats, 100 pounds; wheat, 200 pounds; cracked corn, 200 pounds. The dry mash for the same period was 100 pounds each of bran, shorts, corn meal, crushed oats and middlings; 50 pounds each of beef scrap, fish meal, dry buttermilk and 25 pounds each of bone meal and charcoal grade 4, together with 5 pounds of common salt and 2 gallons of cod liver oil mixed in the dry mash.

From June 12 to the end of the contest, 100 pounds more oats were added to the grain ration and 100 pounds more bran were added to the dry mash mixture.

Shells, grit, coarse beef scrap, water and green feed were before the b rds at all times. The green feed consisted of mangels, sprouted oats and green clover.

The dry mash was fed in hoppers and the grain in the litter.

APICULTURE

The winter of 1929-30 was comparatively open. February and March were mild and the snowfall was light. The fields were bare during March and the clover winter-killed severely. The first flight was noted on March 11, and the bees were flying freely the latter part of the month. Eighteen colonies were packed in the fall of 1929. Two died during the winter and three were queenless. The latter were united, leaving thirteen colonies, spring count. The average strength of these was seven frames of bees.

The summer was very dry with above average sunshine. Clover was scarce and the average production for the season was 63·8 pounds. Fifteen colonies were packed for winter in two-colony wintering cases, with shavings as protection. The average strength when packed was 10·2 frames of bees.

Wintering in Double Brood Chamber

Five colonies that were exceptionally strong in the fall of 1929 were wintered with a shallow super of stores above the brood chamber. Two died during the winter and one was queenless and was united. The data collected were as follows:—

Results from Single and Double Brood Chambers

Item	Double brood chamber		Single brood chamber	
	1930	Three-year average	1930	Three-year average
Number of colonies wintered	5	10	13	43
Number of colonies—spring count	2	6	11	38
Average strength—fall	12·8	13·7	8·8	8·8
Average strength—spring	7	10	7	7·2
Average production of honey—spring count—pounds	54	79·3	65·5	71·8

A comparison of 10-frame Langstroth and 10-frame Jumbo hive bodies gave the following results:—

Results from Langstroth and Jumbo Hives

Item	Ten-frame Langstroth		Ten-frame Jumbo	
	1930	Three-year average	1930	Three-year average
Number of colonies wintered	11	38	2	8
Number of colonies—spring count	10	34	2	8
Average strength—fall	8·6	8·9	9·5	9·1
Average strength—spring	6·5	6·6	7·5	7·7
Average production of honey—spring count—pounds	59·7	70·1	65·5	53·6

Financial Statement

Debit

By Labour in apiary	$ 57 33		
Supplies purchased	49 93		
Queens purchased	5 00		
		$ 110 25	
To 839 pounds honey at 18 cents per pound	$ 149 22		
Approximate value of wax produced	4 40		
		$ 153 62	
Credit balance		43 36	

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