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 1929

Rod-row variety tests of wheat, oats and barley on the Nappan Experimental Farm in 1929.

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DOMINION EXPERIMENTAL FARM, NAPPAN, N.S.

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THE SEASON

The winter of 1928-29 was characterized by lack of snow, changeable weather and a high mean temperature. In December, 1928, the mean was 6·8° above average, while the average for January, February and March was 2° above average. Very few severe storms were experienced, consequently the highways were passable for motor traffic with little interruption until March. The frost penetrated to a considerable depth and was late coming out of the ground in the spring. In spite of this, the newly seeded fields came through the winter in excellent condition and the clover stand was excellent.

April was cool with a light rainfall, it being 0·81 inches below average. May was showery, rain falling on 15 different days and on the 20th a snowfall of 5 inches was recorded, the latest date on record at this Farm.

Sunshine was recorded on twenty-eight days, showing the changeable nature of the weather during the month. The first field grain was seeded on the 19th, but seeding was not general until the 29th. June was very dry, a total of 1 inch of rain falling on seven different days throughout the month. This was 1·85 inches below average. July and August were also hot and dry, the rainfall of 3·71 inches coming chiefly in light showers, followed by hot drying winds, making it less beneficial than would otherwise have been the case. Germination of root seeds was very slow and growth poor. Grain yields were reduced and the growth of straw was very light, the weight of grain harvested being nearly equal to the straw weight.

Pastures were good until the middle of August, when they dried up completely.

The season was excellent for the hay harvest and also for grain, except the late sown, which was damaged to some extent by heavy rains on September 14, 15, 18 and 19. This month was also hot and dry except for the rain on these dates. This rain undoubtedly saved the root crop, as it relieved the drought situation and also checked the aphid infestation which was severe on both swedes and clover aftermath.

October was cool and showery, but on the whole was excellent weather for harvest and all crops were stored in good condition.

Fall ploughing was delayed by the dry condition of the soil until after the middle of September, but by the time freeze-up occurred on November 23, a large percentage of the land for the 1930 crop had been ploughed.

On this Farm the land for hoed crops was ploughed in July and topworked and should be in excellent condition next spring. Steady winter weather set in before the end of November, and December was cold, the ground being covered with snow for the entire month. The mean temperature was 3·22 degrees below normal, the precipitation 1·43 inches above and the sunshine 10·5 hours below the average at this Farm.

8499—1½

Month	Temperature °F.				Precipitation						Sunshine		
	Maximum	Minimum	Mean	Average for 21 years	Rainfall Days	Rainfall Inches	Snowfall Days	Snowfall Inches	Total	Average for 22 years	Days	Hrs.	Average for 18 years
									in.	in.			hours
January	56	—13	18·84	17·24	6	2·27	10	19·5	4·22	3·00	22	102·8	95·4
February	42	—16	19·54	16·35	2	1·19	4	11·0	2·29	2·73	22	117·9	105·5
March	52	—12	28·08	26·24	6	1·41	6	13·0	2·71	2·82	26	135·1	122·7
April	66	20	36·63	37·58	6	1·95			1·95	2·76	24	141·0	137·9
May	82	30	49·18	48·51	15	3·79	1	5·0	4·29	2·38	28	187·5	179·7
June	83	33	58·15	57·48	7	1·00			1·00	2·85	28	215·6	208·2
July	82	41	64·60	64·25	9	2·59			2·59	3·06	31	262·7	218·8
August	84	36	63·06	62·95	7	1·12			1·12	3·40	26	213·6	210·3
September	81	28	56·50	55·60	6	3·90			3·90	3·04	25	148·4	162·9
October	74	22	46·16	46·94	12	2·61			2·61	3·70	24	114·1	125·1
November	58	3	34·56	35·37	7	2·55	2	4·0	2·95	3·30	22	87·5	83·2
December	40	—7	19·63	22·85	6	2·15	10	29·5	5·10	3·67	19	65·2	75·7

Total precipitation ..... 34·73
Average precipitation for 22 years ..... 36·71

Days of rainfall 89
Days of snowfall 21
Days of sunshine 297

Inches of rainfall ..... 26·53
Inches of snowfall (equal to 8·2 inches rain) ..... 82·00
Hours of sunshine ..... 1,791·40
Average hours of sunshine for 18 years ..... 1,725·50

ANIMAL HUSBANDRY

The work in this division in 1929 was a continuation of that outlined in previous reports. Data were collected on the cost of maintenance and production. Various feeding experiments were carried on and records taken on breeding and marketing projects.

DAIRY CATTLE

The following dairy cattle were on hand January 1, 1930:—

	Guernseys (pure-bred)	Jerseys (pure-bred)
Mature bulls	2	1
Yearling bulls	1	2
Bull calves	4	—
Mature cows	10	3
Four-year-old cows	5	1
Three-year-old cows	4	1
Two-year-old heifers	6	3
Yearling heifers	8	1
Heifer calves	10	2
Total	50	14

The dairy herd passed the ninth consecutive clean test for tuberculosis in 1929 and has been fully accredited since 1922. The blood test for contagious abortion was applied on four different occasions in 1928 and 1929 without a reactor.

The past year was the first one in which culling was possible to any extent in the Guernsey herd, at the same time increasing the number of females. Five poor producers and one sterile cow were sold for beef and ten heifer calves were dropped, an increase at the end of the year of four females. Three bulls out of R. O. P. dams were sold for breeding purposes. Since the establishment of the

herd in 1920, forty-two cows have dropped one hundred and thirty-eight calves, seventy-eight males and sixty females. Thirty males have been sold for breeding purposes, ten have died or were still-born, seven retained in the herd and the balance killed because of poor type or poor producing ancestry. Of the females, six died or were still-born; the balance of fifty-four have been or are being raised. Forty-one are in the herd at the present time, the balance having been culled, twelve because of poor production and one that was sterile after dropping five normal calves. Two of the foundation cows, Princess Daisy of Hillside and Cabbage Rose of Hillside, daughters of Island Prince of Hillside, are still in the herd. They are both over thirteen years of age, but are still regular breeders and profitable producers.

The senior herd sire, Blanche's Raider of Nappan —3602—, is a son of King's Blanch of Hillside, one of the leading cows of the breed, with 12,230 pounds milk and 752 pounds of fat at five years of age. The first three daughters of this sire to complete records in this herd averaged as two-year olds 6,223 pounds of milk and 347 pounds of butterfat as compared with the average records of their dams of 4,632 pounds of milk and 255 pounds of fat. This is an increase of 34 per cent in milk and 36 per cent in butterfat. Two of these daughters qualified in the Record of Performance while the third failed by a very few pounds of milk, although she had 31 pounds of butterfat in excess of the requirements.

The junior herd sire, Canadian Raider —5111—, is a son of Blanche's Raider and out of Canadian Birch —1737—, with a two-year-old record of 8,303 pounds of milk and 411 pounds of fat. This bull is being mated to his half sisters and to his sire's half sisters, and the calves by him are very typey and show all the indications of real dairy females. A son of this bull, out of Cabbage Rose of Nappan—2715—is being retained in the herd. Cabbage Rose of Nappan has completed five lactations, qualifying in the Record of Performance each time as follows:—

RECORD OF CABBAGE ROSE OF NAPPAN

Age	Number of days milking	Pounds of milk produced	Per cent fat	Pounds butterfat produced	Increase over requirements milk fat		Canadian R.O.P. number
Yr Days		lb.	%	lb.	lb.	lb.	
2 231	365	6,098	6·10	372	466	91	237
3 286	335	6,915	5·50	380	132	41	277
4 314	365	8,037	5·75	462	177	69	377
6 70	365	9,692	5·49	532	1,692	132	472
7 183	305	7,807	5·58	436	607	76	229a
Average		7,710	5·65	436	615	82	

Of the milking females in the herd at the present time, eight have qualified for R. O. P. certificates and several heifers are making very creditable records at the present time.

The first two sires used on this herd were a disappointment. Mixter May Raider left eleven daughters, eight of which have completed two-year-old records, with two qualifying in the Record of Performance. Three others are making fair records at the present time and show promise of being good producers. Glamour's Fisherman of Nappan also left eleven daughters, all of which have completed records with only one qualifying. One other has reached the requirements as a three-year-old. Eight of these heifers have been discarded because of low production.

In 1928-29 the grade herd of Ayrshires and Holsteins was disposed of and in its place a herd of Jerseys was established, One three-year-old, one four-

year-old and two mature cows were purchased in Nova Scotia and five imported heifers were purchased in Ontario. These five heifers were sired by Palatine's Observer (Imp.) 6134 P.S., a son of Imported Observer, who in turn was a son of Jersey Volunteer. The dam of Palatine's Observer was by General Cowslip. These bulls are all well known sires, both on the Island of Jersey and in America, having been prize winners themselves and also the sires of many high producing daughters. On the dam's side these heifers are granddaughters of Prince Prudence 3rd (Imp.), War Bread (Imp.), Signal of Oaklands (Imp.), Pedro, and Rosebay Was Wanted, all well known Jersey sires.

Four of the imported heifers have freshened and are making fair records as two-year-olds. Two of the Nova Scotia bred cows have completed records in the Record of Performance. These are Lena of Clifton 33302, with 8,962 pounds of milk and 411 pounds of fat as a three-year-old and Marionette of Wellington 23439, with 8,224 pounds milk and 417 pounds of fat at eight years of age. Lena of Clifton is out of a half sister of Marionette of Wellington, whose sire was Edgley Sunbeam's Lad 6989. He now has four daughters qualified and is thus an R. O. P. sire. Bessie's Sunray 25645, the four-year-old mentioned above, is making a fair record. She is out of a half sister of Marionette and sired by Fluffy's Sunray Noble 19258, a good son of Fluffy's Fontaine Imp. with 517 pounds of butterfat.

The reader will see from this information that the foundation of the Jersey herd is based principally on two lines of breeding, the Canadian bred line and the imported line.

The herd sire in use is Ottawa Gamboge 5th —32116— a class AA sire by Castlehill Sybil's Gamboge (Imp.), a son of Sybil's Gamboge (Imp.), one of the best known Jersey sires in America. The dam of Ottawa Gamboge 5th was Brampton Erica's Pride, a daughter of Observer (Imp.). She has a two-year-old record of 496 pounds of butterfat. The use of this bull on the imported heifers will intensify the Observer line and also introduce the blood of the Sybil Gamboge family. Therefore, the breeding back of this foundation herd is such that one might look for some very excellent records from the progeny of these cows.

One of the imported heifers dropped a bull calf, imported in dam. He is a double grandson of Palatine's Observer and was sold to head one of the well known herds in the province.

As none of the Jerseys have completed lactation periods, no complete records can be given in this report.

Following are the individual records of all Guernseys completing a lactation period in 1929; and also the average of the herd since 1922:—

GUERNSEYS—INDIVIDUAL MILK RECORDS COMPLETED DURING THE YEAR 1929

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 fat	Value of butter at 43 cents per pound	Value of skim-milk at 20 cents per cwt.	Total value of product	Amount of meal eaten at $2.20 per cwt.	Amount of roots eaten at $3.40 per ton	Amount of hay eaten at $3.90 per ton	Amount of green feed eaten at $4 per ton	Amount of ensilage eaten at $3.80 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
		Years		lb.	lb.	%	lb.	$	$	$	lb.	lb.	lb.	lb.	lb.		$	$	cts.	cts.	$
Princess Daisy of Hillside—2039	Mar. 30/28	12	306	5,766·7	18·85	5·12+	347·64	149 49	10 94	160 43	2,187	4,450	3,972	1,610	2,030	4 11/30	89 16	1 55	26	17	71 27
Princess Stannox of Nappan—2384	Nov. 9/28	7	318	4,393·7	13·82	5·06+	261·78	112 57	118 34	120 91	1,684	8,870	3,750	1,752	1,280	4 1/15	83 28	1 89	32	11	37 63
Patricia of Stannox—2125	Nov. 26/27	7	558	9,143·2	16·39	5·07−	545·22	234 44	17 36	251 80	3,773	9,220	7,146	2,460	3,170	6	153 42	1 68	28	15	98 38
P. Dairymaid of L. K. 4th—2044	May 25/28	8	251	3,215·2	12·81	5·42+	205·20	88 24	6 08	94 32	1,628	3,680	3,332	1,610	2,000	4 11/30	72 65	2 26	35	8	21 67
N. Stannox—3615	July 8/28	4	382	7,438·9	19·47	4·93−	431·11	185 38	14 15	199 53	2,461	8,100	4,234	1,610	1,810	6 1/15	105 55	1 42	24	19	93 98
N. Stannox 2nd—3616	Apr. 10/28	4	348	6,122·8	17·59	5·00+	360·51	155 02	11 63	166 65	2,233	6,210	4,564	1,610	2,030	4 11/30	95 80	1 56	27	16	70 85
N. Cabbage Rose—4055	Apr. 19/28	3	287	3,882·1	13·53	5·26+	240·36	103 35	7 36	110 71	1,937	3,680	3,476	1,610	2,180	4 11/30	80 43	2 07	33	10	30 28
N. Queen—4058	Oct. 14/28	3	284	3,791·3	13·35	4·78+	213·38	91 75	7 22	98 97	1,575	8,270	3,730	1,005	1,190	3 7/30	76 05	2 01	36	7	22 92
N. Rose 2nd—4946	Apr. 10/28	2	325	5,331·3	16·40	5·29−	331·62	142 64	10 10	152 74	2,102	4,800	3,044	1,610	1,080	4 11/30	81 96	1 54	25	18	70 78
N. Dairymaid—4943	Apr. 18/28	2	368	5,520·7	15·00	5·72+	371·56	159 77	10 41	170 18	2,375	6,840	3,732	1,610	920	4 11/30	94 19	1 71	25	18	75 99
N. Red Rose—4944	Sept. 21/28	2	401	7,773·9	19·39	5·61−	512·66	220 44	14 68	235 12	2,487	9,110	4,088	2,172	1,660	4 1/15	104 02	1 34	20	23	131 10
N. Patricia—4059	Mar. 15/28	3	314	6,808·1	21 68	5·04+	404·05	173 74	12 93	186 67	2,131	3,660	2,868	1,610	1,260	4 11/30	80 21	1 18	20	23	106 46
Cabbage Rose of N.—2715	Sept. 23/28	7	304	7,807·9	25·68	5·57−	511·20	219 82	14 75	234 57	2,828	13,970	3,738	1,885	1,190	5 7/15	118 90	1 52	23	20	115 67
Cabbage Rose of Hillside—1909	Feb. 22/29	12	295	5,752·9	19·50	5·33+	360·92	155 20	10 89	166 09	1,602	6,620	3,544	1,412	1,870	3 3/10	75 25	1 31	21	22	90 84
Rose of Nappan—3599	Jan. 22/29	5	319	4,771·6	14·96	5·81−	325·89	140 13	8 99	149 12	854	8,950	4,064	1,412	1,820	3 3/10	64 97	1 36	20	23	84 15
N. Blanche—4056	Jan. 15/29	3	290	5,427·6	18·72	5·17−	329·96	141 88	10 29	152 17	1,788	7,190	3,430	932	1,710	3 3/10	78 54	1 45	24	19	73 63
N. Patricia—4059	Mar. 11/29	4	275	5,356·4	19·48	5·20−	327·56	140 85	10 16	151 01	1,463	5,360	3,084	1,412	1,870	3 3/10	68 00	1 27	21	22	83 01
N. Princess 2nd—6235	Nov. 25/28	2	340	5,536·6	16·28	4·83+	314·61	135 28	10 54	145 82	1,908	7,240	3,478	932	1,710	3 3/10	81 47	1 47	26	17	64 35
N. Glamour—5556	Dec. 10/28	2	325	5,375 2	16·54	5·36+	339·15	145 83	10 17	156 00	1,776	6,640	3,238	932	1,710	3 3/10	76 48	1 42	23	20	79 52
N. Daisy—4054	Aug. 23/28	4	251	2,549·8	10·16	4·98−	149·29	64 19	4 85	69 04	1,332	7,165	3,156	1,610	60	4 13/30	67 73	2 66	45	−2	1 31
N. Rose—4057	Sept. 24/28	3	219	3,130·9	14·30	5·04+	185·73	79 86	5 95	85 81	1,334	8,105	3,156	1,710	60	2 13/30	65 57	2 09	35	8	20 24
Total for herd—21 lactations		99	6,760	114,896·8	17·00	5·23	7,069·50	3,039 87	217 79	3,257 66	41,458	148,130	78,824	32,506	32,610	86	1,813 63	1 58	26	17	1,444 03
Average for herd of 21 lactations		4·7	322	5,471·3	17·00	5·23	336·64	144 76	10 37	155 13	1,974	7,054	3,754	1,548	1,553	4·1	86 36	1 58	26	17	68 76
Average 1922—29 for 101 lactations		4·86	343	5,626·7	16·40	5·34	353·39	147 21	10 66	157 87	2,483	5,467	3,879	1,699	1,456	4·52	98 07	1 74	28	14	59 80

NOTE.—In compiling these records, the average butterfat percentage for each lactation is given to two decimal places only. In order to balance the table correctly, these would need to be carried to six decimals, thus taking up more space than is necessary.

It is interesting to note the records of five individuals shown in this table, namely, Cabbage Rose of Hillside, her daughter, Cabbage Rose of Nappan, her two granddaughters, Rose of Nappan, and Nappan Rose 2nd and her great granddaughter, Nappan Red Rose (a daughter of Rose of Nappan). These proved to be five of the most profitable cows in the herd and represent four generations in the one family line.

FINANCIAL STATEMENT OF GUERNSEY HERD 1929

To	Feed cost for twenty-one cows	$ 1,813 63
	Feed cost for eight heifers to one year of age	260 74
	Feed cost for ten calves to January 1, 1930 or to date of disposal	212 33
	Feed cost for 3 bulls to one year of age	113 74
	21 bull services at $5	105 00
	30 tons straw at $5	150 00
		$ 2,655 44
By—		
	Sale of 7069·5 pounds butter at 43 cents	$ 3,039 89
	Sale of 108,895 pounds skim-milk at 20 cents per cwt	217 79
	Sale of 3 bulls for breeders	290 00
	Sale of 3 calves for beef	60 60
	Sale of 12 calf skins at 75 cents	9 00
	Sale of 3 hides 69 pounds at 10 cents	6 90
	10 heifer calves on hand at $100	1,000 00
	4 bull calves on hand at $50	200 00
	190 tons manure at $2	380 00
		$ 5,204 18
	Credit Balance	$ 2,548 74

FINANCIAL STATEMENT FOR EIGHT-YEAR PERIOD

Year	Number of lactations	Debit	Credit	Credit balance
		$	$	$
1922 to 1928 (from 1928 report)	80	12,354 73	21,785 91	9,431 18
1929	21	2,655 44	5,204 18	2,548 74
Total	101	15,010 17	26,990 09	11,979 92
Average 1 year	12·6	1,876 27	3,373 76	1,497 49
Average 1 lactation	1	148 62	267 23	118 61

INDIVIDUAL RECORDS OF ALL GRADE COWS COMPLETING A LACTATION PERIOD IN 1929

Name of cow	Date of dropping calf	Number of lactation period	Number of days in milk	Total pounds of milk for period	Daily average yield of milk	Average per cent of fat in milk	Pounds of butter produced in period	Value of butter at 30 cents per pound.	Value of skim-milk at 20 cents per cwt.	Total value of products	Meal eaten at 1½ cents per pound	Roots eaten and ensilage eaten at $2 per ton	Hay eaten at $7 per ton	Green feed eaten at $3 per ton	Months on pasture at $1 per month	Total cost of feed for period	Cost of feed to produce 100 pounds of milk	Cost of feed to produce 1 pound butter, skim-milk neglected	Profit on 1 pound butter	Profit on cow for period, labour and calf neglected
			No.	lb.	lb.	%	lb.	$	$	$	lb.	lb.	lb.	lb.	mos.	$	$	cts.	cts.	$
Ayrshires—																				
Spot 1A42	April 8/28	7	307	8,223·2	26·79	4·27	413·09	123 93	15 74	139 67	2,238	6,500	3,828	1,610	4½	54 65	0 66	13	17	85 02
Myrtle 1A112	May 7/28	7	241	6,804·5	28·23	3·99	319·41	95 82	13 07	108 89	1,752	5,840	3,796	1,610	4½	47 81	0 70	15	15	61 08
Jessie 1A122	May 25/28	6	270	8,523·7	31·57	4·64	465·29	139 59	16 26	155 85	1,893	5,760	3,108	1,610	4½	47 08	0 55	10	20	108 77
Jessie 1A1221	May 28/28	4	274	7,493·3	27·35	4·47	394·06	118 22	14 32	132 54	1,893	6,040	3,220	1,610	4½	47 75	0 64	12	18	84 79
Jessie 1A512	Dec. 20/27	3	390	8,456·9	21·68	4·59	456·67	137 00	16 14	153 14	2,676	7,020	4,836	2,460	4½	65 45	0 77	14	16	87 69
Jessie 1A54	Feb. 3/28	3	335	6,430 0	19·19	4·52	341·92	102 58	12 28	114 86	2,304	6,400	4,244	1,610	4½	56 84	0 88	17	13	58 02
Jessie 1A1223	June 18/28	2	243	5,416·9	22·29	4·57	291·24	87 37	10 34	97 71	1,769	5,920	3,268	1,610	4½	46 25	0 85	16	14	51 46
Holsteins—																				
Jessie 1HS24	Nov. 16/27	2	468	10,558·2	22·56	3·57	443·44	133 03	20 36	153 39	3,805	8,780	5,576	2,460	5½	85 05	0 81	19	11	68 35

COST OF PRODUCTION OF MILK FOR THE GRADE HERD OF HOLSTEINS AND AYRSHIRES

Amount of feed per 100 pounds milk	Price of feed	Cost of feed per 100 pounds milk
1929		
Meal—29·61 pounds	$2·20 per cwt.	$0·651
Roots and ensilage—84·42 pounds	3·60 " ton	0·152
Hay—51·5 pounds	8·90 " ton	0·229
Green feed—23·55 pounds	4·00 " ton	0·047
Pasture—1·75 days	2·00 " month	0·117
		$1·196
Eight-year Average		
Meal—34·03 pounds	2·02 per cwt.	0·687
Roots and ensilage—88·17 pounds	4·32 " ton	0·190
Hay—55·9 pounds	9·71 " ton	0·271
Green feed—23·42 pounds	4·20 " ton	0·049
Pasture—2·01 days	2·00 " month	0·134
		1·331
Seventeen-year Average		
Meal—35·61 pounds	2·28 per cwt.	0·812
Roots and ensilage—101·29 pounds	3·62 " ton	0·183
Hay—68·66 pounds	10·92 " ton	0·375
Green feed—29·58 pounds	3·57 " ton	0·053
Pasture—3·21 days	2·00 " month	0·214
		1·637

In 1929 the average butterfat percentage was 4·3 and the feed cost per pound of butterfat was 27·8 cents, based on eight lactation periods. The average production of milk was 7,738·3 pounds and of butterfat 332 pounds. For the eight-year period 1922-29 the average milk production was 6,651 pounds of milk, based on 160 lactation periods, the average per cent fat was 4·12 per cent and the cost per pound of butterfat was 32·3 cents. The average production for the seventeen-year period, based on 401 lactation periods, was 5,537 pounds, the average per cent butterfat 4·02 and the cost per pound of butterfat was 40·7 cents.

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
1929		
Meal—36·1 pounds	$2·20 per cwt.	$0·794
Roots—128·9 pounds	3·40 " ton	0·219
Hay—68·6 pounds	8·90 " ton	0·305
Ensilage—28·38 pounds	3·80 " ton	0·054
Green feed—28·3 pounds	4·00 " ton	0·057
Pasture—2·25 days	2·00 " month	0·150
		$1·579
Eight-year Average		
Meal—44·9 pounds	2·02 per cwt.	0·907
Roots and ensilage—119·7 pounds	4·30 " ton	0·257
Hay—68·97 pounds	9·71 " ton	0·335
Green feed—30·37 pounds	4·20 " ton	0·064
Pasture—2·47 days	2·00 " month	0·165
		$1·728

The average butterfat percentage in 1929 was 5·24 and the feed cost per pound was 30·13 cents, based on twenty-one lactation periods. The eight-year

average percentage butterfat was 5·34 per cent, with a feed cost of 32·4 cents per pound, based on 101 lactations. The average production of milk was 5,626·7 pounds.

The weekly cost of milk production for the Guernsey herd is given in the following table:—

WEEKLY FEED COST OF MILK PRODUCTION 1929.—GUERNSEYS

Week ending	No. of cows	Feeds required for 100 pounds milk						Feed cost per 100 pounds milk	
		Meal	Roots	Hay	Ensilage	Green feed	Pasture	1929	6-year average
		lb.	lb.	lb.	lb.	lb.	days	$	$
Jan. 5	20	42·19	200·0	97·09	.....	.....	.....	1 760	1 96
" 12	20	40·49	285·71	102·04	.....	.....	.....	1 916	1 84
" 19	21	40·98	294·12	107·50	.....	.....	.....	1 968	1 87
" 26	21	38·17	277·78	97·09	.....	.....	.....	1 828	1 81
Feb. 2	19	37·04	256·41	87·72	.....	.....	.....	1 718	1 83
" 9	18	39·84	270·27	91·74	.....	.....	.....	1 825	1 84
" 16	18	40·82	285·71	96·15	.....	.....	.....	1 897	1 77
" 23	18	39·22	285·71	96·15	.....	.....	.....	1 862	1 77
Mar. 2	19	39·22	294·12	98·04	.....	.....	.....	1 887	1 75
" 9	18	36·23	285·71	99·01	.....	.....	.....	1 809	1 73
" 16	20	41·49	312·50	103·09	.....	.....	.....	1 957	1 82
" 23	20	40·32	303·03	100·00	.....	.....	.....	1 938	1 78
" 30	19	40·32	294·11	97·09	.....	.....	.....	1 907	1 83
April 6	19	40·49	303·03	99·01	.....	.....	.....	1 938	1 81
" 13	19	40·82	294·12	102·04	.....	.....	.....	1 940	1 83
" 20	18	38·61	303·03	100·00	.....	.....	.....	1 910	1 83
" 27	18	39·22	303·03	102·04	.....	.....	.....	1 923	1 85
May 4	18	39·68	92·59	99·01	123·46	.....	.....	1 734	1 79
" 11	20	34·72	81·97	87·72	109·89	.....	.....	1 527	1 84
" 18	21	33·89	.....	83·33	172·41	.....	.....	1 445	1 80
" 25	22	35·21	.....	87·71	192·38	.....	.....	1 531	1 80
June 1	24	34·72	.....	86·95	188·68	.....	.....	1 459	1 75
" 8	24	33·11	.....	51·28	128·21	.....	2·56	1 371	1 62
" 15	20	27·32	.....	.....	.....	.....	4·41	0 895	1 45
" 22	20	12·18	.....	.....	.....	.....	4·69	0 581	0 91
" 29	20	.....	.....	.....	.....	.....	5·19	0 346	0 83
July 6	20	.....	.....	.....	.....	.....	5·38	0 360	0 71
" 13	20	.....	.....	.....	.....	.....	5·78	0 390	0 74
" 20	20	.....	.....	.....	.....	.....	5·89	0 392	0 74
" 27	17	5·68	.....	.....	.....	.....	5·24	0 474	0 82
Aug. 3	17	14·22	.....	.....	.....	.....	5·58	0 685	1 01
" 10	17	14·71	.....	.....	.....	80·00	5·81	0 871	1 10
" 17	17	15·41	.....	.....	.....	97·09	6·70	0 980	1 23
" 24	17	15·90	.....	.....	.....	113·64	6·28	0 996	1 22
" 31	17	16·64	.....	.....	.....	117·65	6·57	1 039	1 26
Sept. 7	17	17·95	.....	.....	.....	128·21	7·09	1 124	1 39
" 14	17	25·25	.....	.....	46·30	108·70	7·81	1 390	1 53
" 21	19	32·36	.....	.....	78·13	123·46	.....	1 107	1 53
" 28	17	37·88	.....	80·65	80·65	.....	.....	1 345	1 72
Oct. 5	18	37·45	.....	80·80	80·00	.....	.....	1 332	1 56
" 12	20	33·33	.....	72·46	72·47	.....	.....	1 213	1 66
" 19	20	37·31	.....	75·76	75·76	.....	.....	1 322	1 75
" 26	20	39·84	.....	77·51	77·51	.....	.....	1 387	1 76
Nov. 2	19	38·91	.....	74·62	74·62	227·27	.....	1 801	1 92
" 9	16	38·31	.....	74·07	67·11	208·33	.....	1 732	1 81
" 16	16	42·02	.....	87·71	72·99	217·39	.....	1 906	1 84
" 23	16	43·10	303·03	107·53	.....	.....	.....	2 263	1 91
" 30	17	43·10	312·50	114·94	.....	.....	.....	2 322	1 91
Dec. 7	14	42·55	250·00	94·34	.....	.....	.....	2 039	1 88
" 14	15	42·91	250·00	98·03	.....	.....	.....	2 062	1 87
" 21	15	41·84	232·60	91·74	.....	.....	.....	1 961	1 90
" 28	17	36·90	212·80	90·90	.....	.....	.....	1 795	1 97

The six-year average feed cost per 100 pounds of milk produced for each month is as follows: January, $1.87; February, $1.80; March, $1.78; April, $1.83; May, $1.81; June, $1.31; July, $0.75; August, $1.16; September, $1.54; October, $1.73; November, $1.87; December, $1.91.

The average butterfat test during this period was 5·25 per cent.

COST OF RAISING GUERNSEY HEIFERS TO DATE OF FIRST FRESHENING—8-YEAR AVERAGE

Items		From date of birth to one year of age	From one year of age to date of dropping first calf	Total
Number of heifers	No.	34	34	34
Average number days fed	days	365	543	908
Average pounds whole milk consumed	lb.	1,453	.....	1,453
Average pounds skim-milk consumed	"	3,346	.....	3,346
Average pounds meal consumed	"	594	1,362	1,956
Average pounds roots consumed	"	782	3,759	5,660
Average pounds silage consumed	"		1,119	
Average pounds hay consumed	"	1,396	3,864	5,260
Average pounds green feed consumed	"	161	720	881
Average months on pasture	"	.....	6·13	6·13
Cost of feed per head	$	56 08	68 06	124 14

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

Item		Guernseys			Jerseys Bulls 1929
		Heifers		Bulls 1929	
		1929	9-year average		
Number of animals		8	44	3	1
Whole milk consumed, per head	lb.	804	1,325	882	1,016
Skim milk consumed, per head	"	3,578	3,419	4,468	2,696
Meal consumed, per head	"	217	515	346	413
Roots consumed, per head	"	769	816	826	539
Ensilage consumed, per head	"	76		234	786
Hay consumed, per head	"	1,026	1,344	1,331	1,461
Green feed consumed, per head	"	.....	124	.....	.....
Pasture, per head	months	2¼	⅞	.....	.....
Cost of feed, per head	$	32 59	51 64	37 91	39 03

Feed prices used for 1929—

Whole milk	$1 58 per cwt.
Skim-milk	4 00 per ton.
Meal	2 10 per cwt.
Roots	3 40 per ton.
Ensilage	3 80 per ton.
Hay	8 90 per ton.
Pasture	1 00 per month.

The cost of rearing dairy heifers is an item in cost accounting seldom taken into consideration by the average dairyman. Many farmers may rear dairy heifers on less feed than is shown in the above table, but one of two things must take place: either the heifers will be stunted and unable to produce to the maximum of their inherited milking propensities or they must of necessity be carried to a greater age before dropping their first calf. In either case the actual cost would approximate that given above.

These data are of value in showing the necessity of keeping only the best heifers. It costs just as much to rear a poor individual to thirty months of age as it does a good one. For this reason strict culling is necessary in order to build up a herd that will return a profit over and above the feed, labour and overhead charges.

A comparison of the cost of rearing spring versus fall calves shows that twenty-six fall calves cost an average of $49.82 to rear to one year of age, while

eighteen spring calves cost an average of $54.26. This is due chiefly to the fact that the fall calves have the benefit of green feed and pasture, while those dropped in the spring are too young to be turned out and therefore consume more milk, meal, roots and hay, thus increasing their cost. It does more harm than good to wean a spring calf and turn it on pasture the first summer, but a well developed fall calf will make good use of greenfeed or pasture, as its greater development enables it to digest properly a larger amount of such roughages.

FEED COST OF MAINTAINING MATURE DAIRY BULLS FOR ONE YEAR

Year	Number of bulls	Average feeds consumed per head					Feed cost
		Meal	Roots	Ensilage	Hay	Green feed	
		lb.	lb.	lb.	lb.	lb.	$
1925	4	1,877	2,860	1,995	4,957	1,500	72 70
1926	5	1,721	2,409	1,124	3,551	1,932	62 66
1927	2	1,432	1,350	2,400	5,062	300	61 62
1928	2	1,464	2,740	3,210	5,124	.....	88 40
1929	2	755	3,930	2,146	5,054	.....	49 10
Average (5 years)	1	1,561	2,635	1,941	4,538	1,084	66 82

FEEDING METHODS

The feeding methods followed in 1929 were very similar to those outlined in the 1928 report. The pastures were exceptionally good during the past season until August, when the growth was checked severely by lack of moisture. The quality of feed harvested was excellent, especially the hay, and milk production the latter part of the year was holding up exceptionally well.

BEEF CATTLE

The work in this branch of the Animal Husbandry Division consists of experimental feeding tests with beef steers during the winter months.

At the present time there are twenty-three steers on hand. The experiment being conducted is a duplication of that carried on in 1928-29, the results of which are given below.

In 1928 twenty steers were purchased and after dehorning, were divided into four lots of five steers each. Lot one was a group of heavy steers and were fed a maximum of 8 pounds of meal per steer per day. Lot two were medium weight steers and received a maximum of 10 pounds of meal per day. Lot three were medium steers and were fed a maximum of 6 pounds of meal, while lot four, light weight steers, were fed the same as lot one. Swedes were fed at the rate of 50 pounds per steer per day, together with a liberal ration of good quality mixed hay.

The results of this experiment are as follows:—

STEER-FEEDING EXPERIMENT, 1928-29
HEAVY VS. LIGHT STEERS
HEAVY VS. LIGHT MEAL FEEDING

Items		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	5	5	5
Initial gross weight Oct. 31	lb.	5,400	4,940	4,910	4,210
Initial average weight Oct. 31	"	1,080	988	982	842
Finished gross weight March 17	"	7,030	6,320	6,060	5,650
Finished average weight, March 17	"	1,406	1,264	1,212	1,130
Total gain in 137 days	"	1,630	1,380	1,150	1,440
Average gain per head	"	326	276	230	288
Average daily gain per head	"	2·38	2·01	1·68	2·10
Total meal consumed at $45.20 per ton	"	4,955	6,000	3,860	4,955
Total roots consumed at $3.40 per ton	"	33,475	33,475	33,475	33,475
Total hay consumed at $8.90 per ton	"	10,960	10,275	10,275	9,590
Total cost of feed	$	217 66	238 23	189 87	211 57
Cost of feed per pound gain	cts.	13·35	17·26	16·51	14·69
Meal consumed per head per day	lb.	7·23	8·76	5·64	7·23
Initial cost at $8.566 per cwt	$	462 56	423 16	420 59	360 63
Final value at $9.618 per cwt	$	676 15	607 86	582 85	543 42
Value of spread plus gain	$	213 59	184 70	162 26	182 79
Total loss per lot	$	−4 07	−53 53	−27 61	−28 78
Average loss per steer	$	−0 81	−10 71	−5 52	−5 76
Total dry matter consumed	lb.	18,676	19,000	17,074	17,443
Dry matter consumed per pound gain	"	11·46	13·77	14·85	12·11
Gain per 1,000 pounds live weight per 1,000 pounds dry matter consumed	"	16·16	14·70	13·72	19·61

NOTE:—The initial cost of the steers per hundredweight is based on their weights when the experiment was started. The price of feeders was very high during the fall of 1928, without a corresponding increase the following spring. In order to make a fair profit, a spread of at least $2.50 per hundredweight is necessary.

The results are similar to those given in previous reports as regards the maximum amount of meal that is economical, namely, 7 to 8 pounds per head per day, or an average for the winter period of about 6 to 7 pounds. The heavy steers made the most economical gains in this test.

FINANCIAL STATEMENT

Debit

To 20,968 pounds (20 steers) at 8 cents live weight		$ 1,677 44
Feed cost for 20 steers for 137 days		857 33
3 tons straw at $5		15 00
Freight and inspection		57 20
	$	2,606 97

Credit

By 23,970 pounds (20 steers) at 10¼ cents	$	2,456 92
80 tons manure at $2		160 00
		2,616 92
Credit balance		9 95

DEHORNING STEERS

Eight steers were dehorned on December 5, 1929. The average weight on that day was 864 pounds. Three weeks later, on December 26, they averaged 913 pounds, a gain of 49 pounds per steer.

Dehorned steers are more easily fed and handled, make better gains and find a more ready sale on the livestock market. The loss in shipment from bruises and injuries is far less than when the horns are left on. The loss from dehorning is practically nil and the benefits are many.

HORSES

There were twelve horses in stock on January 1, 1930, 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 1929:—			
112 bushels oats at 70 cents per bushel	$	78 40	
548 pounds bran at $30.90 per ton		8 47	
404 pounds roots at $3.40 per ton		0 69	
6,000 pounds hay at $8.90 per ton		26 70	
			$ 114 26
By—			
1,609 hours work at 10 cents per hour	$	160 90	
			$ 160 90
Credit balance			46 64

COST OF MAINTENANCE OF DRAUGHT HORSES

Feed cost	$	114 26
Labour		39 00
Interest—$200 at 6 per cent		12 00
Shelter		18 00
Harness and repairs		2 05
Shoeing		9 47
Total yearly cost	$	194 78
Hours of labour during year		1,609
Cost per hour of labour	$	0·121

SWINE

The swine herd on January 1, 1930, consisted of eighty-four pure-bred Yorkshires, made up of two boars, twelve brood sows and seventy feeders, an increase of twenty-one head over 1928. One aged sow was sold and four young sows were retained for breeding purposes.

The demand for breeding stock was slightly better than in 1928. Twenty-seven pure-bred pigs were sold, six boars and twenty-one sows.

One hundred hogs were finished for market during 1929, fifty-three of these grading select bacon. Three hundred and ninety-three hogs were finished during the past six years and 192 or 48·6 per cent graded select.

The breeding herd of females is being built up on the blood lines of the "Augustine," "Lady Alice" and "Lass" families.

The majority of the herd belong to the former and are all descended from one foundation sow, Ottawa Augustine 61 —57687—. Selection is made for average length, combined with strength of bone and depth of side, together with prolificacy and milking ability.

The following chart gives the relationship of the present members of this family to the foundation sow:—

Nappan Augustine 29....	Charlottetown Boy.....		
Nappan Augustine 30....	Nappan Augustine 24.....	Jimmy Brown.	
Nappan Augustine 27....	Rogerfield Wonder (Imp.)....		
	Nappan Augustine 24.....	Ottawa Augustine 61.	
Nappan Augustine 25....	Rogerfield Wonder (Imp.).		
Nappan Augustine 26....			
Nappan Augustine 28....	Nappan Augustine 19.....	Dolphington Max (Imp.)	
		Ottawa Augustine 61.	
	Nappan Augustine 14.....	C. E. F. Roseberry 15.	
		Ottawa Augustine 61.	

NOTE:—Ottawa Augustine is the dam of three females in the herd at the present time, Nappan Augustine 14, 19 and 24. Three daughters of Nappan Augustine 19 are in the herd, and three daughters of Nappan Augustine 24. All show to a remarkable degree, the body type of the foundation sow.

The six mature sows of the Augustine family in the herd at present have farrowed in 32 litters, 397 pigs, raising 293 or an average raised of 9·16 pigs per litter. In nearly all cases the sows raise two litters per year, as this is the only way in which the cost per pig weaned can be reduced to a profitable figure.

The nine sows bred in 1929 farrowed 17 litters, with a total of 211 pigs. They raised 155 or an average of 9·12 pigs per litter. The following table gives the financial statement of the herd for 1929:—

FINANCIAL STATEMENT OF BROOD SOWS

Number of sows	Average meal consumed per day	Cost of feed per sow for year	Number litters farrowed	Average number of pigs per litter	Average number raised to 6 weeks	Average per cent raised	Average cost per pig at 6 weeks	Average value at 6 weeks
	lb.	$				%	$	$
9	5·3	41 63	17	12·4	9·12	73·5	2 42	6 23

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 23
Average profit per pig over feed cost	3 81
Number of pigs raised per sow in the year	17 20
Average profit per sow over feed cost	65 53
Total profit on nine sows over feed cost	589 77

FINANCIAL STATEMENT OF SWINE HERD 1929—9 SOWS, 1 BOAR AND PROGENY

Debit

29,419 pounds crushed oat at $42 per ton	$ 617 80
14,569 pounds middlings at $37.90 per ton	276 08
15,060 pounds shorts at $32.90 per ton	247 74
8,034 pounds bran at $30.90 per ton	124 13
18,365 pounds barley at $50 per ton	459 12
1,046 pounds oilmeal at $60 per ton	31 38
756 pounds cornmeal at $50 per ton	18 90
611 pounds feed flour at $35 per ton	10 69
3,030 pounds fish meal at $90 per ton	136 35
36,354 pounds skim-milk at $4 per ton	72 71
3,420 pounds minerals at $20 per ton	34 20
30,726 pounds roots at $4 per ton	61 45
14,492 pounds potatoes at $6.67 per ton	48 33
13,286 pounds miscellaneous feed at $3 per ton	19 93
32 months pasture at 50 cents per month	16 00
12 tons straw at $5 per ton	60 00
	$ 2,234 81

Credit

By sale of pork—(live weight prices)—	
456 pounds at 6 cents per pound	$ 27 36
345 pounds at 8 cents per pound	27 60
2,830 pounds at 11½ cents per pound	318 38
7,173 pounds at 11¾ cents per pound	842 83
5,180 pounds at 12¾ cents per pound	660 45
2,730 pounds at 13 cents per pound	354 90
2,270 pounds at 13¼ cents per pound	306 45
7 registered pigs, 6 weeks old at $10 each	70 00
1 registered boar, 10 weeks old at $12	12 00
4 pigs at $7 each	28 00
1 pig at $12	12 00
14 pigs at $6 each	84 00
Young feeders on hand—69 at $6	414 00
80 tons manure at $2	160 00
Premiums for select bacon	27 00
	$ 3,344 97
Less deductions for thick smooth and butcher hogs	25 50
	$ 3,319 74
Labour and investment returns	$ 1,084 66

FINANCIAL STATEMENT FOR SEVEN-YEAR PERIOD, FROM 1923-1929 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
Total	14,137 91	19,312 85	5,174 94
Average	2,019 70	2,758 98	739 28

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

To feed for 9 sows	$ 374 67		
17 boar services at $1	17 00		
3 tons straw at $5	15 00		
		$ 406 67	
Less 9 tons manure at $2		18 00	
Total cost to raise 155 pigs to 6 weeks of age			$ 388 67
Cost to raise 1 pig to 6 weeks of age			2 51
To cost of 100 pigs 6 weeks of age at $2.51			$ 251 00
Feed for 100 pigs to finishing			1,526 00
7 tons straw at $5 per ton			35 00
			$ 1,812 00
By 25 tons manure at $2 per ton			50 00
Total cost to produce 20,183 pounds pork			$ 1,762 00
Total cost to produce 1 pound of pork			8 73 cents

The sales of bacon hogs made from this farm during the months of April, May, June, October and November, for 1929, realized an average price of $12.30 per hundred as compared with $10.12 for 1928 and $9.50 for 1927. The top price of $13.50 was received in June, while the lowest was in August, $10.25; with an average selling price of $12.30 and an average feed cost of $8.73 per hundred, a very encouraging spread of $3.57 per hundred was realized. Only once in the past seven years has the spread between the selling price and the feed cost price been as good, and that was during 1926.

The consistent feeder who stayed with the business throughout the lean years was in a position to reap the full benefits of the good prices prevailing throughout 1929.

The following table gives the average feed cost prices for raising hogs for each of the past seven years; also the average market prices received by this farm.

It is interesting to note from the following table how fairly consistent the feed cost price has been as compared with the market price. These figures indicate, to a degree at least, the effect of supply and demand on prices received. It is the breeder who keeps a well-balanced supply to offer each year who reaps the best harvest.

COST OF RAISING PIGS TO SIX WEEKS OF AGE AND COST OF PORK PRODUCTION 1923 TO 1929 INCLUSIVE

Year	Cost to raise pigs to 6 weeks of age	Cost of pork production per cwt. live weight	Average market price 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
Average for seven years	3 62	8 81	10 61

FEEDING METHODS

The brood sows were fed during 1929 on a mixture of crushed oats, 200 pounds, shorts, 200 pounds, and bran 100 pounds. During the winter months crushed mixed grain is fed in place of the oats, and for the week previous to and the week following farrowing, bran alone is fed. During the summer months rape pasture is provided and meal is not fed until the middle of August, or such time as the sows need it previous to farrowing. A large amount of cull apples, potatoes and roots are marketed through the swine herd, as will be noted in the financial statement.

The feeders received a meal mixture as follows:—

During weaning period: Equal parts of crushed, hulless oats and flour middlings.

After weaning:—

——	First 60 days	60 to 90 days	90 days to finish
	lb.	lb.	lb.
Middlings	200	100	.....
Crushed oats	100	150	150
Crushed barley	50	100	200
Shorts	50	50	100
Bran	25	25	.....
Oil meal	14	14	14
Fishmeal (70%)	10	10	10
Bone char	4½	4½	4½
Salt	2¼	2¼	2¼

During the winter months it has been found advisable to increase the bran to 50 pounds in the mixture.

Pasture and green feed is provided in the summer and roots in the winter, with plenty of exercise. Dry sleeping quarters are essential to successful feeding during the winter. Skim milk is provided, if available. If not, the amount of fishmeal is increased to 8 per cent of the meal mixture. A mineral mixture of soft coal, 20 pounds, sulphur 1 pound, bone meal 2 pounds, salt 1 pound, and calcium carbonate 1 pound is supplied to all pigs on the plant at all times, and clover or alfalfa hay during the winter months.

EXPERIMENTAL FEEDING

Two experiments were conducted during 1929; one, a comparison of cooked versus uncooked turnips and mangels, and the other a continuation of the skim-milk versus fishmeal tests reported in previous bulletins.

The following tables give the results of the first of these tests:—

VALUE OF COOKED VS. UNCOOKED TURNIPS AND MANGELS FOR BACON HOGS—WINTER 1928-29

Items		Pen 1, uncooked mangels	Pen 2, cooked mangels	Pen 3, uncooked turnips	Pen 4, cooked turnips
Hogs in test	No.	5	5	6	6
Initial gross weight	lb.	189	155	211	159
Initial average weight	"	37·8	31·0	35·2	26·5
Days on test	days	122	122	122	122
Finished gross weight	lb.	785	763	948	900
Finished average weight	"	157	152·6	158	150
Total gain for period	"	596	608	737	741
Average gain for period	"	119·2	121·6	122·8	123·5
Average daily gain per hog	"	0·977	0·998	1·007	1·012
Total meal consumed	"	1,933	1,933	2,262	2,262
Total roots consumed	"	1,342	1,342	1,597	1,597
Total skim-milk consumed	"	1,147	1,147	1,356	1,356
Total fishmeal consumed	"	100	100	120	120
Total mineral mixture consumed	"	108	108	125	125
Meal consumed per pound gain	"	3·24	3·18	3·07	3·05
Total cost feed	$	55 58	57 59	65 23	67 63
Average cost of feed, per hog	$	11 12	11 52	10 87	11 27
Cost of feed, per hog, per day	cts.	9·12	9·44	8·91	9·24
Cost of feed, per pound gain	"	9·33	9·47	8·85	9·13

Feed prices used—

Meal	$2 35 per cwt.
Roots—	
Uncooked	3 40 per ton.
Cooked	6 40 per ton.
Skim-milk	4 00 per ton.
Fishmeal	90 00 per ton.
Minerals	20 00 per ton.

The results show a very slight increase in daily gain through the use of cooked roots in each case, but the extra cost of cooking more than offsets this advantage. There was very little difference shown between the relative values of turnips and mangels in this experiment. The results of the skim-milk, fishmeal experiment are as follows:—

FISH MEAL VERSUS SKIM-MILK FOR BACON HOGS—SUMMER 1929

Items		Pen 1 skim-milk weaning to finish	Pen 2 fish meal weaning to finish
Hogs in test	No.	10	10
Initial gross weight	lb.	218	213
Initial average weight	"	21·8	21·3
Days on test	days	128	128
Finished gross weight	lb.	1,945	1,859
Finished average weight	"	194·5	185·9
Total gain for period	"	1,727	1,646
Average gain for period	"	172·7	164·6
Average daily gain per hog	"	1·349	1·286
Total meal consumed	"	4,812	4,812
Total green feed consumed	"	1,238	1,238
Total skim-milk consumed	"	6,300	.....
Total fish meal consumed	"	.....	385
Total minerals consumed	"	134	134
Meal consumed, per pound gain	"	2·786	2·923
Total cost of feed	$	122 28	127 01
Average cost of feed, per hog	$	12 23	12 70
Cost of feed, per hog, per day	cts.	9·55	9·92
Cost of feed, per pound gain	"	7·08	7·72

Feed prices used—

Meal	$ 2 20 per cwt.
Green feed	4 00 per ton.
Skim-milk	4 00 per ton.
Fish meal	90 00 per ton.
Minerals	20 00 per ton.

These results show up slightly in favour of the skim-milk, due principally to the high cost of the fish meal. From our experiments there is no doubt that fish meal is a valuable supplement to skim-milk when the latter is not available. The development of the hogs fed fish meal is equal to, if not better than that of those fed skim-milk and has been found to be superior to those fed on tankage. Further experiments are being conducted with skim-milk and fish meal in 1930.

ADVANCED REGISTRY OF SWINE

Five sows were entered for Advanced Registry under the new policy adopted by the Dominion Department of Agriculture in 1929. Five pigs from each litter were carried through to finishing. Four were then selected and slaughtered at the Swift Canadian Packing Plant at Moncton, N.B. A representative of the Live Stock Branch tatooed the entire litter from each sow at weaning time, when the five pigs were selected for slaughter. When up to select bacon weights or from 200 to 220 pounds, they are weighed and shipped. Records are taken at the plant on the live weight, dressed weight, dressing percentage, character and weight of Wiltshire side, thickness of fat and general quality of the carcass. From these data, together with the growth records, a classification is being drawn up to determine the relative merits of the different sows and their eligibility to qualify for Advanced Registration. The object of this policy is to eliminate the poorer strains in the bacon breeds and raise the standard of excellence of Canadian bacon. This Advanced Registration work is open to all pure-bred breeders of bacon hogs, who are interested in the improvement of their breeding stock.

At this Farm, records were kept of the feed consumed during each thirty-day period. The hogs were also weighed every thirty days and at the end of the test. The following table gives the data collected on the pigs fed during the past summer in this work. The records taken at the packing plant are not as yet available for publication:—

DATA COLLECTED RE PIGS FROM FIVE SOWS

Items		Nappan Augustine 25	Nappan Augustine 26	Nappan Augustine 19	Nappan Augustine 27	Nappan Augustine 24
Date of birth of sow		Apr. 12/27	Apr. 12/27	Mar. 19/24	Aug. 24/27	Oct. 3/25
Date litter was farrowed		Mar. 23/29	Mar. 23/29	Apr. 10/29	Mar. 27/29	Mar. 31/29
Number of hogs fed	No.	5	5	5	5	4
Initial gross weight	lb.	90	96	80	83	71
Initial average weight	"	18	19·2	16	16·6	17·8
Days on test	days	149	155·4	152·0	155·4	151·3
Finished gross weight	lb.	1,047	1,042	1,027	1,064	865
Finished average weight	"	209·4	208·4	205·4	212·8	216·3
Total gain for period	"	957	946	947	981	794
Average gain for period	"	191·4	189·2	189·4	196·2	198·5
Average daily gain per hog	"	1·285	1·218	1·246	1·263	1·312
Total meal consumed	"	2,820	3,010	2,932	3,017	2,318
Total skim-milk consumed	"	2,005	2,005	1,853	2,005	1,432
Total green feed consumed	"	890	970	1,007	956	794
Total minerals consumed	"	69	73	70	73	70
Meal consumed, per pound gain	"	2 947	3·182	3·096	3·075	2·919
Total cost of feed	$	69 34	73 77	71 77	73 90	56 82
Average cost of feed, per hog	$	13 87	14 75	14 35	14 78	14 21
Cost of feed, per hog, per day	cts.	9·31	9·49	9·44	9·51	9·39
Cost of feed, per pound gain	"	7·246	7·798	7·579	7·533	7·167

Feed prices used—

Meal	$ 2·229 per cwt.
Skim-milk	4 per ton.
Green feed	4 per ton.
Minerals	20 per ton.

The relationship between the five sows given above is very close. Nappan Augustine 19 and 24 are half sisters. Nappan Augustine 25 and 26 are litter mates out of 19 and sired by Rogerfield Wonder, while Nappan Augustine 27 is out of 24 and by this sire. A detailed study of the individuals in each litter shows that the five pigs from Augustine 25 ranged in weight when slaughtered from 186 to 231, four being over 200 pounds. In the next lot one reached 232 pounds in 149 days, the others being kept 8 days longer, when they ranged in weight from 190 to 215 pounds. The pigs in the third lot were all finished in 152 days and ranged from 195 to 216 pounds in weight. Lot 4 were very similar to lot 2 in development. One hog reached 238 pounds in 149 days, while the others ranged from 199 to 217 pounds in 157 days. In lot 5 one hog died during the early part of the test. Of the remaining four, one weighed 216 pounds in 149 days, while the others ranged from 207 to 228 pounds in 152 days.

In 1928 as a preliminary test to the formulating of the Advanced Registry policy, the entire litters from eight sows were carried through along the same lines as were the above lots. The results of this test are given below:—

DATA ON PRELIMINARY TEST FOR ADVANCED REGISTRATION OF SWINE

Item	Nappan Augustine 25	Nappan Augustine 26	Nappan Augustine 19	Nappan Augustine 22	Nappan Augustine 24	Nappan Lady Alice 6	Nappan Lass 6	Nappan Lass 12
Date of birth of sow	April 12, 1927	April 12, 1927	Mar. 19, 1924	April 16, 1925	Oct. 3, 1925	Nov. 15, 1923	Nov. 26, 1921	Mar. 28, 1927
Date litter was farrowed	May 7, 1928	April 16, 1928	Mar. 2, 1928	April 19, 1928	Feb. 29, 1928	April 20, 1928	May 1, 1928	May 9, 1928
Number of hogs fed ..... No.	7	9	8	6	8	9	6	13
Initial gross weight ..... lb.	188	173	159	163	73	221	134	313
Initial average weight ..... lb.	26·9	19·2	19·9	27·2	24·3	24·6	22·3	24·1
Days on test ..... days	169	170	165	165	165	165	156	154
Finished gross weight ..... lb.	1,460	1,690	1,493	1,140	634	1,871	1,084	2,633
Finished average weight ..... lb.	208·6	187·8	186·6	190	211·3	207·9	180·7	202·5
Total gain for period ..... lb.	1,272	1,517	1,334	977	561	1,650	950	2,320
Average gain for period ..... lb.	181·7	168·6	166·7	162·8	187	183·3	158·4	178·4
Average daily gain per hog ... lb.	1·075	0·992	1·010	0·987	1·133	1·111	1·015	1·158
Total meal consumed ..... lb.	3,281	4,794	3,636	3,075	1,364	4,926	2,678	7,293
Total skim milk consumed ... lb.	2,562	3,788	3,936	2,562	1,476	3,843	2,562	5,527
Total fish meal consumed .... lb.	205	205	126	143	47	214	157	425
Total minerals consumed ..... lb.	70	96	117	71	44	96	65	120
Total roots consumed ..... lb.	1,470	1,107	360	750	133	1,125	810	2,067
Total days on pasture ..... days	630	855	840	570	315	855	552	1,196
Meal consumed per pound gain. lb.	2·58	3·16	2·73	3·15	2·43	2·99	2·82	3·14
Total cost of feed ..... $	97 94	135 63	104 65	88 09	39 25	139 06	79 58	209 61
Average cost of feed per hog .. $	13 99	15 07	13 08	14 68	13 08	15 45	13 26	161 12
Cost of feed per hog per day .. cts.	8·28	8·86	7·93	8·89	7·93	9·36	8·50	10·47
Cost of feed per pound gain ... cts.	7·70	8·94	7·84	9·02	7·00	8·43	8·37	9·03

Feed prices used:—

Meal, $2.25 per cwt.	Minerals, $20 per ton.
Skim-milk, $4 per ton.	Roots, $7.25 per ton.
Fish meal, $65 per ton.	Pasture, 1 cent per day.

The hogs were graded at the slaughter house and the following table gives the results together with the cost of feed per hog and the return per hog for each litter:—

RESULTS OF GRADING, AND COST OF FEED

Sow	Grading data				Cost of feed per hog in litter	Return per pig in litter
	Select	Thick smooth	Shop	Heavy	$	$
Nappan Augustine 25	3	4	.....	.....	13 99	20 29
Nappan Augustine 26	3	6	.....	.....	15 07	18 11
Nappan Augustine 19	3	4	1	.....	13 08	17 75
Nappan Augustine 22	2	4	.....	.....	15 01	18 33
Nappan Augustine 24	2	.....	.....	1	13 08	21 00
Nappan Lady Alice 6	8	1	.....	.....	15 45	20 86
Nappan Lass 6	3	3	.....	.....	13 26	19 23
Nappan Lass 12	10	3	.....	.....	16 12	20 02

SHEEP

The flock of pure-bred Shropshires numbered fifty head on January 1, 1930. These consisted of twenty-six aged ewes, nine shearling ewes, twelve ewe lambs, one aged ram and two ram lambs. The aged ram, Stewart 132—60513—has two top crosses of "Buttar" breeding and is being used on the daughters of Buttar 332 (Imp.)—38074—the former flock ram. In 1929 a ram lamb was selected from the flock, sired by Stewart 132 and out of a daughter of Ottawa Chieftain 80—26081—an outstanding sire of breeding ewes. This ram is being used on his own half sisters, in an attempt to improve the quality of fleece in the flock. He is an outstanding individual in every way and should do much to raise the standard of excellence of the flock, which is already on a high level. The demand for breeding stock was greater than could be filled. Eleven rams were sold during the year, also three ewe lambs and one proven ewe.

In 1929 thirty ewes dropped forty-seven lambs, raising forty-three or 143.3 per cent. The average raised per ewe during the past ten years is 134 per cent, while the five-year average is 146·1 per cent. The wool clip in 1929 averaged 9 pounds for the breeding ewes, 6·6 pounds for the shearling ewes, 7 pounds for the shearling rams and 10 pounds for the aged ram. The wool was sold through the Canadian Co-operative Wool Growers' Association. With their co-operation, it was possible to obtain the individual grade of each fleece in 1928 and 1929. In this way it is hoped that considerable improvement may be made within the next few years in the average grade for the flock by eliminating those with poor fleeces.

Six rams were graded in 1929, five grading XXX and one XX.

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

RECORDS OF LAMBS

—	Number of lambs	Birth weight, average	Gain for for first month, average
	No.	lb.	lb.
Females	91	7·27	14·16
Males	94	7·85	16·48
Singles	47	8·69	18·68
Twins	120	7·41	16·43
Triplets	18	5·62	13·69
Average for all lambs	185	7·56	15·34

MANAGEMENT OF FLOCK

During January and February the flock was maintained on turnips and clover hay. From March 1 until lambing time (starting March 15), the breeding ewes received one half-pound of meal mixture per day. After lambing, this was gradually increased to two pounds per day during April and May. The rams and shearling ewes received only roots and hay during this time, and were turned to pasture on May 15. The ewes and lambs were all on pasture on the 30th. They were used in a pasture experiment reported in the chemistry section of this report.

The lambs were weaned on August 1 and those of poor type culled and marketed. In September the breeding ewes were turned on clover aftermath and in October a light meal ration was provided until after the breeding season closed, the latter part of November. The rams also received about one-half

pound of meal per day during this time. In December the meal ration was removed and the ewes were in excellent condition for wintering cheaply on roots and hay. The meal mixture used in the fall is 200 pounds crushed oats, 100 pounds bran and 25 pounds each of oil meal and cracked corn, but no corn is fed in the spring.

The flock is dipped each spring and fall in Cooper's Dip, with excellent results. Internal parasites, which were infesting the flock severely a few years ago are practically under control, through the use of Mema (tetrachlorethylene), gelatine capsules. These are very easily administered, with no danger to the animal and are giving exceptionally good results. The flock is treated twice yearly. In addition to this treatment, it is necessary to provide a change of pasturage if complete control is to be accomplished. This was done in 1929 and the flock showed the benefit of the change during the pasture season while the lambs slaughtered showed only a trace of parasitic infestation.

FINANCIAL STATEMENT OF FLOCK, 1929

Debit

To feed for 30 breeding ewes and ram:—		
4,668 pounds meal at $40 per ton	$ 93 36	
15,556 pounds roots at $3.40 per ton	26 45	
13,683 pounds hay at $8.90 per ton	60 89	
5,147 days pasture at 2 cents per day	102 94	
		$283 64
To feed for 10 yearling ewes:—		
170 pounds meal at $40 per ton	$ 3 40	
3,737 pounds roots at $3.40 per ton	6 35	
3,737 pounds hay at $8.90 per ton	16 63	
1,867 days pasture at 2 cents per day	37 34	
		63 72
To feed for 3 yearling rams:—		
1,035 pounds roots at $3.40 per ton	$ 1 76	
870 pounds hay at $8.90 per ton	3 87	
420 days pasture at 2 cents per day	8 40	
		14 03
To feed for 43 lambs:—		
572 pounds meal at $40 per ton	$ 11 44	
1,314 pounds roots at $3.40 per ton	2 23	
1,314 pounds hay at $8.90 per ton	5 85	
5,792 days pasture at 1 cent per day	57 92	
		$ 77 44
Total cost of feed		$438 83
To loss of 3 ewes at $20		60 00
		$498 83

Credit

By:—		
Sale of 330 pounds wool at 25·9 cents per pound	$ 85 47	
Sale of 984 pounds lamb at 10 cents (live weight)	98 40	
Sale of 66 pounds lamb at 23 cents (dressed weight)	15 18	
Sale of 50 pounds mutton at 16 cents (dressed weight)	8 00	
Sale of 46 pounds lamb at 25 cents (dressed weight)	11 50	
Sale of 3 sheepskins at 50 cents	1 50	
Sale of 2 lambskins at 40 cents	0 80	
Sale of 1 shearling ram at $35	35 00	
Sale of 1 shearling ram at $30	30 00	
Sale of 1 shearling ram at $27	27 00	
Sale of 3 XXX ram lambs at $30	90 00	
Sale of 1 XXX ram lamb at $25	25 00	
Sale of 1 XX ram lamb at $22	22 00	
Sale of 1 ungraded ram lamb at $22.50	22 50	
Sale of 2 ungraded ram lambs at $18	36 00	
Sale of 1 proven ewe at $50	50 00	
Sale of 3 ewe lambs at $20	60 00	
1 XXX ram lamb in stock at $30	30 00	
1 ungraded ram lamb in stock at $18	18 00	
30 tons manure at $2 per ton	60 00	
Increased stock 12 ewe lambs at $15	180 00	
		$906 35

Credit—Concluded

Labour and investment returns		$407 52
Cost of maintaining a pure-bred flock:—		
Total feed cost for 40 ewes and ram	$347 41	
Average feed cost per head	8 47	
Cost to raise pure-bred lambs:—		
To feed cost for 30 ewes and ram	283 64	
To feed cost for 43 lambs	77 44	
		$361 08
By 245 pounds wool at 25·9 cents	63 46	
25 tons manure at $2	50 00	
		113 46
Total cost for 43 lambs		$247 62
Average cost for 1 lamb		5 76
Value of wintering pure-bred ram lambs:—		
To value of 3 lambs, 1928, at $20	$ 60 00	
Feed cost	14 03	
		$ 74 03
By sale of 3 shearling rams	92 00	
Sale of 25 pounds wool at 25·9 cents	6 47	
½ ton manure at $2	1 50	
		99 97
Credit balance	$ 25 94	
Average per ram	8 65	

SUMMARY OF THE ABOVE DATA COVERING THE 10-YEAR PERIOD 1920–29 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	.....	−37 34
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
Average	8 53	5 35	8 95	260 15

FIELD HUSBANDRY

THE SEASON

The growing season of 1929 will be remembered as one of the driest on record in this district. During June, July and August, the rainfall was only 4·71 inches, or 4·6 inches below the 22 year average for these months. Seeding was delayed by cold, dull weather in May. The first grain was seeded on May 19, but seeding was not general until the 29th. All crops germinated well except swedes, which were delayed by the dry, hot weather and, as a result, the crop was far below average. Hay on newly seeded fields was excellent, the clover stand being nearly 100 per cent on all fields, while harvesting weather was perfect. Grain yields were fair, and the quality good. Late sown grain was damaged to some extent by heavy rains on September 14 and 18. Fall ploughing was delayed by the dry condition of the soil, but was practically completed in this district before freeze-up, which occurred on November 23.

CULTURAL EXPERIMENTS

The cultural work started in 1922 was carried on as outlined in the report for 1927. The following is a summary of the results to date from the more important experiments:—

Preparation of Sod Land for Grain.—Ploughing early in autumn, with top working, has proven to be the most economical treatment to date. Ribbing has a slight beneficial effect, the land drying out one or two days earlier in the spring, but the slight increase in yield is not sufficient, as yet, to offset the extra labour charges.

After-Harvest Cultivation of Sunflower Ground for Grain.—Disking in the spring, with no autumn treatment, has resulted in consistently higher yields and, in addition, is the cheapest treatment.

Seed-Bed Preparation for Grain.—Following a turnip crop, disking, seeding and smoothing is giving the most economical results.

Preparation of Sod Land for Sunflowers.—Manuring and ploughing in summer and topworking, has proven to be the most economical treatment. A second ploughing, (in the spring), apparently increases the yield slightly, but not sufficient to pay for the extra labour. Late fall ploughing and spring ploughing are giving lower yields than early fall ploughing.

Preparation of Sod Land for Roots.—The same general results are being obtained here as with the sunflower experiment.

Depth of Ploughing Sod Land for Grain.—Ploughing sod land to a depth of 5 inches has resulted in yields equal to those obtained from 7 to 9 inch depths, for both fall and spring ploughing. The average yield on the fall ploughed plots is much higher than on the spring ploughed ones. The yield of roots the year following is not increased by the deep ploughing of the sod land.

Rates of Seeding a Nurse Crop of Oats.—There is very little difference in the grain yields seeded at 2, 2¾ and 3½ bushels per acre. The clover and timothy yields following these different seedings are consistently higher on the plots seeded at the lower rates.

Quantities of Manure and Place in Rotation.—Excellent results are being obtained from this experiment. Manure is applied at different rates (12, 16 and 20 tons per acre), in a four-year rotation of turnips, oats, clover, timothy and also on different crops in the rotation. This experiment was started

on land newly cleared in 1917. The results covering the six-year period, 1924-29, are as follows:—

QUANTITIES OF MANURE AND PLACE IN THE ROTATION YEAR 1929

Plot No.	Crop	Plot treatment	Yield per acre		Cost of manure or fertilizer per acre	Value of crop per acre after deducting cost of manure or fertilizer	
			1929	Average yield, 6 years		Value 1929	Average value, 6 years
83	Clover	16 tons manure in winter or spring before roots	1·40 tons	1·607 tons	$ 4 80	$ 10 60	$ 11 04
37	Timothy		0·92 "	1·627 "	2 40	7 72	14 17
175	Turnips		11·38 "	16·767 "	9 60	13 16	39 46
129	Oats—seeded	Grain	40·00 bush.	46·82 bush.	7 20	30 48	25 75
		Straw	·92 tons	1·009 tons			
		Totals			24 00	61 96	90 42
84	Clover	12 tons manure in winter or spring before roots	1·22 tons	1·390 ton.	3 60	9 82	10 24
38	Timothy		0·62 "	1·510 "	1 80	5 02	13 69
176	Turnips		10·80 "	15·743 "	7 20	14 40	39 15
130	Oats—seeded	Grain	38·24 bush.	43·90 bush.	5 40	30 42	25 87
		Straw	·83 tons	0·926 tons			
		Totals			18 00	59 66	88 95
85	Clover	20 tons manure in winter or spring before roots	1·90 tons	1·867 tons	6 00	14 90	12 29
39	Timothy		1·10 "	1·843 "	3 00	9 10	15 92
177	Turnips		9·76 "	17·160 "	12 00	7 52	37 10
131	Oats—seeded	Grain	50·00 bush.	48·53 bush.	9 00	38 26	26 10
		Straw	1·19 tons	1·312 tons			
		Totals			30 00	69 78	91 41
86	Clover	No manure application	0·44 tons	0·887 tons		4 84	9 37
40	Timothy		0·46 "	1·323 "		5 06	13 98
178	Turnips		0·36 "	6·363 "		0 72	21 86
132	Oats—seeded	Grain	24·12 bush.	36·18 bush.		22 54	26 74
		Straw	·51 tons	·766 tons			
		Totals				33 16	71 95
87	Clover	Top dress clover sod in winter for timothy, 16 tons per acre	0·90 tons	1·207 tons	2 40	7 50	9 90
41	Timothy		1·20 "	1·990 "	9 60	3 60	8 72
179	Turnips		10·36 "	12·877 "	7 20	13 52	32 69
133	Oats—seeded	Grain	24·71 bush.	40·490 bush.	4 80	18 36	23 48
		Straw	0·54 tons	0·839 tons			
		Totals			24 00	42 98	74 79
88	Clover	8 tons manure in winter or spring before roots	1·50 tons	1·943 tons	7 20	9 30	11 63
42	Timothy		1·56 "	2·103 "	4 80	12 36	16 33
180	Turnips	8 tons manure on stubble before clover	9·68 "	15·210 "	7 20	12 16	38 35
134	Oats—seeded	Grain	37·65 bush.	43·77 bush.	4 80	30 16	26 68
		Straw	0·74 tons	0·958 tons			
		Totals			24 00	63 98	92 99
89	Clover	16 tons manure in winter or spring before roots	1·66 tons	1·757 tons	4 80	13 46	12 63
43	Timothy		0·84 "	1·830 "	2 40	6 84	16 55
181	Turnips		10·16 "	15·673 "	9 60	10 72	35 67
135	Oats—seeded	Grain	47·06 bush.	51·81 bush.	7 20	36 72	27 98
		Straw	0·98 tons	1·095 tons			
		Totals			24 00	67 74	92 82

The crop yields on these plots were reduced in 1929 by lack of moisture during the growing season. Higher yields of hay and grain were recorded following the 20 ton application than on any other series. This may have been due to the added humus in the soil increasing the holding power for moisture. The yields on the unmanured plots are decreasing rapidly from year to year, indicating a lack of humus and available plant food. In this experiment it is assumed that the difference between the yields on the manured and unmanured plots is due to the influence of the manure application. The first crop following this application is charged with 40 per cent of the value of manure applied; the second crop, 30 per cent; the third crop, 20 per cent; the fourth, 10 per cent. On this basis, the value of manure has been determined for each treatment and for each crop and is presented in the following table:—

VALUE OF MANURE IN CROP PRODUCTION—SIX YEAR AVERAGE

Crop	Items	Value of crop produced, increase over check and value of manure per ton for different crops under different treatments in a 4-year rotation							
		16 tons manure before roots	12 tons manure before roots	20 tons manure before roots	Check	16 tons manure before timothy	8 tons manure before roots—8 tons manure before clover	16 tons manure before roots	Average of manured areas
		$	$	$	$	$	$	$	$
Turnips	Value of crop per acre	33 53	31 49	34 32	12 73	25 75	30 42	31 35	31 14
	Increase over check	20 80	18 76	21 59	.....	13 02	17 69	18 62	18 41
	Value of manure per ton	3 25	3 91	2 70	.....	2 71	3 69	2 91	3 14
Oats	Value of crop per acre	36 14	34 20	38 27	27 95	30 33	34 22	38 40	35 26
	Increase over check	8 19	6 25	10 32	.....	2 38	6 27	10 45	7 31
	Value of manure per ton	1 71	1 74	1 72	.....	0 74	1 96	2 18	1 71
Clover	Value of crop per acre	17 31	15 23	19 24	9 35	12 78	21 29	18 01	17 31
	Increase over check	7 96	5 88	9 89	.....	3 43	11 94	8 66	7 96
	Value of manure per acre	2 49	2 45	2 47	.....	2 14	2 49	2 71	2 49
Timothy	Value of crop per acre	17 11	15 79	19 21	13 86	21 51	21 96	19 07	19 11
	Increase over check	3 25	1 93	5 35	.....	7 65	8 10	5 21	5 25
	Value of manure per acre	2 03	1 66	2 68	.....	1 19	2 53	3 26	1 97
All crops	Value of crop per acre	104 09	96 71	111 04	63 89	90 37	107 89	106 83	102 82
	Increase over check	40 20	32 82	47 15	.....	26 48	44 00	42 94	38 93
	Value of manure per ton	2 51	2 74	2 36	.....	1 66	2 75	2 68	2 43

A study of this table shows that over the six-year period barnyard manure has an average value for all crops of $2.43 per ton. When considered from the standpoint of the individual crop, the value for turnips is shown to be $3.14, oats $1.71, clover hay $2.49, and timothy hay $1.97. The increase in oat yields due to the effect of the manure is lower than for any other crop, indicating that less plant food is necessary for the oat crop and that possibly this crop can make use of food elements present in an otherwise unproductive soil.

Considering the different treatments, the value of manure shows a wide variation. When the manure application was divided, 8 tons applied to the root crop and 8 tons to the oat stubble, the valuation given is $2.75 per ton. The 12 ton application before roots shows a valuation of $2.74, while the other treatments are slightly below this, with one exception. When the manure is all applied to the clover sod, the value is only $1.66 per ton. This treatment is not recommended as a general practice in any rotation.

This data will undoubtedly vary from year to year, but they indicate that no hard and fast rule can be set as to the actual value of barnyard manure. In addition to the variability in the composition of the manure, is the variable effect of the manure on different crops. An experiment such as this serves as a guide, however, and should only be used as such.

FERTILIZER EXPERIMENT WITH HAY.—A four-year rotation of oats, followed by three years in hay, is followed. One series of plots is treated with an application of 75 pounds of nitrate of soda and 200 pounds of basic slag, applied in the spring to the third and fourth years in the rotation. Another series receives double this application, while a third is untreated and serves as a check. In 1929 the treated areas gave sufficient increase in crops over the untreated series to more than pay for the fertilizer treatment. Over the six-year period the yields following the lighter applications have just balanced the fertilizer account, while on the heavier treated plots there is still a slight deficit.

Cultural plots. Left—check, receiving no manure. Centre—received 20 tons manure per acre, applied in winter or spring. Right—received 12 tons of manure per acre, applied in winter or spring. Proper cultivation, given at the right time, means increased yields. Increased yields mean a lower unit cost production.

ROTATIONS

The rotations as outlined in our 1928 report were carried on during 1929. Following are the results to date:—

ROTATION 1.—THREE-YEARS' DURATION

Crop	Yield per acre		Cost of production per acre		Cost of production per ton or bushel	
	1929	Average 4 years	1929	Average 4 years	1929	Average 4 years
			$	$	$	$
Turnips	6·273 tons	9·942 tons	55 97	56 97	8 92 per ton	5 73 pet ton
Oats	38·62 bush.	39·88 bush.	23 18	27 50	56 per bush.	0 62 per bush.
Clover	2·005 tons	1·589 tons	21 64	19 45	10 79 per ton	12 24 per ton

ROTATION 2—FOUR YEARS' DURATION

Crop	Yield per acre		Cost of production per acre		Cost of production per ton or bushel	
	1929	Average 4 years	1929	Average 4 years	1929	Average 4 years
			$	$	$	$
Turnips	9·33 tons	11·297 tons	59 63	64 80	6 39 per ton	5 73 per ton
Oats	41·56 bush.	42·34 bush.	25 27	28 89	0 55 per bush.	0 63 per bush.
Clover	1·43 tons	1·45 tons	19 53	19 58	13 66 per ton	13 50 per ton
Timothy	0·755 tons	1·353 tons	16 03	16 65	21 23 per ton	12 31 per ton

ROTATION 3—FIVE YEARS' DURATION

Crop	Yield per acre		Cost of production per acre		Cost of production per ton or bushel	
	1929	Average 4 years	1929	Average 4 years	1929	Average 4 years
			$	$	$	$
Turnips	9·169 tons	10·91 tons	58 16	59 49	6 34 per ton	5 45 per ton
Oats	38·32 bush.	39·60 bush.	25 44	28 53	0 60 per bush.	0 64 per bush.
Clover	2·135 tons	1·903 tons	22 10	21 93	10 35 per ton	11 52 per ton
Timothy	0·600 tons	1·530 tons	15 44	17 16	25 73 per ton	11 22 per ton
Oats	58·18 bush.	41·53 bush.	21 10	21 31	0 29 per bush.	0 43 per bush.

THREE YEAR ROTATION, MANURE VERSUS NO MANURE, 1929

Plot No.	Crop	Plot treatment	Yield per acre		Cost of manure or fertilizer per acre	Value of crop per acre after deducting cost of manure or fertilizer	
			1929	Average yield, 4 years		Value 1929	Average value, 4 years
					$	$	$
1	Timothy	No manure application	2·170 tons	2·09 tons	.....	23 87	22 84
2	Oats	Grain	42·47 bush.	39·36 bush.			
		Straw	0·738 tons	0·913 tons	.....	39 05	32 19
3	Clover		1·45 tons	2·068 tons	.....	15 95	22 69
		Total	.....	.....	.....	78 87	77 72
4	Clover		2·87 tons	2·638 tons	3 60	27 97	23 87
5	Oats	Grain	49·71 bush.	39·10 bush.			
		Straw	0·85 tons	1·068 tons	5 40	40 25	29 30
6	Timothy	Top dressed with 12 tons manure per acre winter of 1928–29	2·62 tons	2·91 tons	9 00	19 82	17 91
		Total	.....	.....	18 00	88 04	71 08

The results obtained in 1929 on the different rotations differ but little from those reported in 1928. The five-year rotation again showed the greatest returns per acre and is a very satisfactory one to adopt. It provides a larger acreage of grain than either of the others and under average conditions the hoed crop following stubble is easier to hoe and cultivate than where it follows timothy sod. The manure versus no manure experiment has been carried on since 1925. It was started on land in a high state of fertility and consequently the unmanured area has given good yields, but these are decreasing from year to year. In 1929 the returns from the manured area were $9.17 higher than from the unmanured area after the value of the manure was deducted.

COST OF PRODUCTION OF FARM CROPS

Cost of production studies were carried on in 1929, as in previous 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
Seed oats, per bushel	1 30
Seed barley, per bushel	1 50
Seed sunflowers, per pound	0 095
Seed corn, per pound	0 04
Seed timothy, per bushel	0 095
Seed red clover, per pound	0 30
Seed alsike, per pound	0 32
Seed turnips, per pound	0 50
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 06
Twine, per pound	0 15

Return Values

Hay, per ton	$ 11 00
Oat and barley straw, per ton	4 00
Wheat straw, per ton	2 00
Turnips, per ton	2 00
Sunflower silage, per ton	3 70
Corn silage, per ton	3 70
Oats, per bushel	0 85
Wheat, per bushel	1 80
Barley, per bushel	1 10
Mixed grain, per bushel	1 07

The cost of growing the various farm crops for 1929 and the average for eight years is given in the following tables:—

Items of expense	Oats	Wheat	Barley	Mixed grain	Corn silage	Sunflower 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
Manure	9 00	9 00	9 00	2 96	12 00	12 00	12 00	6 00	3 00
Seed	3 58	4 50	3 38	4 53	1 00	1 43	1 00	2 00	1 71
Machinery	2 85	2 85	2 85	2 85	5 85	5 85	2 85	2 85	2 85
Twine	0 38	0 38	0 34	0 38	0 60	0 53	.....	.....	.....
Manual labour	3 33	3 53	3 62	3 89	26 35	23 02	38 54	6 58	6 18
Horse labour	0 54	0 60	0 76	0 70	3 52	3 22	3 39	1 02	0 75
Tractor labour	1 50	1 50	1 50	1 80	5 16	4 80	5 16	.....	.....
Threshing	1 66	1 06	1 30	1 90	.....	.....	.....	.....	.....
Total cost per acre	26 84	27 42	26 75	23 01	58 48	54 85	66 94	22 45	18 49
Yield per acre	41·59 bush.	15·13 bush.	26·09 bush.	31·67 bush.	13·33 tons	10·62 tons	11·566 tons	2·205 tons	2·43 tons
Yield per acre—straw	0·641 tons	0·491 tons	0·412 tons	0·837 tons	.....	.....	.....	.....	.....
	$	$	$	$	$	$	$	$	$
Value per acre	35 36	27 24	28 70	33 89	49 32	39 29	23 13	24 26	26 73
Value per acre—straw	2 56	0 98	1 65	3 35	.....	.....	.....	.....	.....
Total value per acre	37 91	28 22	30 35	37 24	49 32	39 29	23 13	24 26	26 73
Profit or loss per acre	11 07	0 80	3 60	14 23	−9 16	−15 56	−43 81	1 81	8 24
Cost per ton or bushel considering value of straw	0·584	1 75	0 96	0 621	4 39	5 16	5 79 0 145 per bush.	10 18	7 61

Items	Oats	Wheat	Barley	Mixed grain	Corn silage	Sunflower silage	O.P.V. silage	Swede turnips	Hay first year	Hay second year
Number of years	8	8	8	7	7	8	6	8	8	6
	$	$	$	$	$	$	$	$	$	$
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 63	11 63	11 63	10 71	15 43	15 50	16 00	16 25	7 75	3 83
Seed	3 36	4 19	2 98	4 14	1 16	1 62	6 11	0 97	1 82	1 76
Machinery	2 85	2 85	2 85	2 85	3 28	3 23	2 85	2 85	2 85	2 85
Twine	0 48	0 34	0 39	0 42	0 24	0 36	.....	.....	.....	.....
Manual labour	5 59	4 66	4 93	6 15	24 89	28 83	12 97	37 62	5 52	4 57
Horse labour	1 63	1 42	1 64	1 78	4 45	4 82	2 86	5 34	1 02	0 85
Tractor labour	1 69	1 71	1 77	1 87	6 42	6 92	5 44	4 96	.....	.....
Threshing	2 03	1 30	1 57	2 31	.....	.....	.....	.....	.....	.....
Total cost per acre	33 26	32 10	31 76	34 23	59 87	65 28	50 23	71 99	22 96	17 86
	bush.	bush.	bush.	bush.	tons	tons	tons	tons	tons	tons
Yield per acre	50·72	18·59	31·39	45·32	13·646	15·045	6·007	17·221	2·38	2·112
	tons	tons	tons	tons				or bush.		
Yield per acre—straw	0·943	0·809	0·899	1·045	.....	.....	.....	688·8	.....	.....
	$	$	$	$	$	$	$	$	$	$
Value per acre	33 10	30 78	32 67	38 69	53 46	59 33	27 03	34 43	25 02	22 34
Value per acre—straw	3 77	1 62	3 60	4 18	.....	.....	.....	.....	.....	.....
Total value per acre	36 87	32 40	36 27	42 87	53 46	59 33	27 03	34 43	25 02	22 34
Profit or loss per acre	3 61	0 30	4 51	8 64	−6 41	−5 95	−23 20	−37 56	2 06	4 48
Cost per ton or bushel considering value of straw	0·581	1 64	0·897	0·663	4 39	4 34	8 36	4 18	9 65	8 46

The economy of producing a larger quantity of grain is again shown in these tables. A greater acreage of grain, properly handled, especially on our marsh lands would lessen the feed costs in the Maritime Provinces and tend towards greater success in the agricultural industry.

DATES OF SEEDING SUNFLOWERS

This experiment, started in 1921, was carried on in 1929 as in previous years. Four seedings were made at weekly intervals, starting on June 7. The following table gives the 1929 and average results to date:—

RESULTS FROM DIFFERENT DATES OF SEEDING SUNFLOWERS

Range of seedings	Number of years tested	Yield per acre	
		1929	Average
		tons	tons
May 20 to June 20	9	18,667	23,692
May 27 to June 27	9	14,917	21,364
June 3 to July 4	8	14,000	19,660
June 10 to July 11	6	8,500	18,167

DISTANCES BETWEEN ROWS OF SUNFLOWERS

This experiment was also started in 1921. The results to date show very little difference in yield when the rows are made at different distances apart. It has been found, however, that the quality of the silage grown in rows 3½ feet apart is more coarse and woody than from the other plots. The 3 foot distance is recommended for ease in cultivation, together with quality of crop.

SUNFLOWERS—RESULTS FROM DIFFERENT DISTANCES BETWEEN ROWS

Distance between rows	Yield per acre	
	1929	8-year average
	tons	tons
2½ feet	14,848	20,974
3 feet	15,257	20,326
3½ feet	14,000	19,956

TOP DRESSING HAY LAND WITH BARNYARD MANURE

In 1921, a five-acre field was divided into two equal parts. At that time it was producing a heavy yield of high quality hay. One section was top dressed at the rate of 20 tons of manure per acre in the spring of 1921 and 16 tons per acre in the fall of 1925. The other section was left untreated. The yield for 1929 on the manured area was 1·817 tons, with a nine year average of 2·173 tons per acre. The unmanured area gave a yield of 1·124 tons per acre in 1929 and 1·606 tons over the nine year period. These yields, however, are not indicative of the full results to be obtained from an experiment of this kind. While the yields from the manured area have remained fairly constant, the quality of the hay harvested has decreased to a very marked degree. The clover and timothy have been largely replaced by fine grasses and weeds. This demonstrates that even the heavy application of barnyard manure is not sufficient to keep up the quality of hay required for feeding purposes, much less for market requirements. The land must be ploughed more frequently than once every nine or ten years, if a good quality product is to be harvested.

The unmanured area is an excellent demonstration of how quickly good productive soil will go down in fertility when neglected. Here, also, the yields are misleading. That of 1929, namely, 1·124 tons per acre is a fair average for most of the upland throughout the district. It was, however, of very low quality, as it would average over 75 per cent weeds, such as oxeye daisy, king devil and fall dandelions. The feeding value would be less than half that cut from the manured area.

Furthermore, some thought must also be given to the spread of weeds that must occur from such areas. This experiment is worthy of inspection when visiting this farm.

FERTILIZER AND LIMESTONE EXPERIMENTS ON MARSH LANDS

A series of experiments were started in 1922 on the marsh area, to determine the value of ground limestone, basic slag, and wood ashes when applied at the time of renewing. Six plots were treated in 1922 and were again ploughed and reseeded in 1929, and received the same treatment as before. The results to date on this area are as follows:—

RESULTS OF FERTILIZER EXPERIMENTS ON MARSH SAND

Treatment	Yield per acre			Total value of crop per acre after deducting cost of fertilizer or limestone
	Oats, 1922	Oats, 1929	Hay, 1923 to 1928	
	bush.	bush.	tons	$
Check	25·3	22·36	1·765	150 53
1½ tons limestone per acre	29·5	41·24	2·249	190 57
2½ tons limestone per acre	31·7	39·44	2·273	184 93
Check	22·6	25·85	1·663	144 63
½ ton 18% slag per acre	26·8	41·28	2·172	176 49
1,400 pounds wood ashes per acre	25·8	45·53	2·124	185 35

In 1924 a similar experiment was started on the marsh area renewed that year. The yield of oats could not be accurately recorded due to the adverse weather conditions at time of harvest. Hay yields have been kept, however, and are given in the following table:

YIELDS OF HAY ON MARSH AREA

Treatment	Yield per acre		Value of crop after deducting cost of fertilizer or limestone
	Yield 1929	5-year average	
	tons	tons	$
1,200 pounds 16% English slag per acre	2·286	3·075	156 77
1,400 pounds wood ashes per acre	1·893	2·519	131 68
Check	1·574	2·135	114 06
1,400 pounds 14% slag per acre	2·195	2·614	132 79
4,000 pounds ground limestone per acre	2·071	2·510	127 30
1,400 pounds 14% slag per acre	2·059	2·490	125 97
Check	1·307	2·045	109 24

Another experiment was started in 1925 along the same lines as the above. The results to date are as follows:—

YIELDS OF OATS AND HAY

Treatment	Yield per acre			Value of crop after deducting the cost of fertilizer or limestone
	Oats, 1925	Hay, 1929	Hay, 4-year average	
	bush.	tons	tons	$
Check	25·41	2·041	2·015	107 53
2½ tons limestone per acre	34·59	2·598	2·513	126 66
1½ tons limestone per acre	31·41	3·078	2·696	136 66
½ ton 14% slag per acre	27·50	2·881	2·645	129 51
Check	13·79	2·324	2·224	108 31
1,400 pounds wood ashes per acre	28·50	2·807	2·630	131 31

The results to date from the experiments outlined above indicate that the use of any form of soil acidity corrector is of value on marsh lands, providing they have proper drainage. The returns from their use have been sufficient to pay their cost value within two or three years, as shown in increased yields over the untreated sections.

In addition to the above, several other experiments were outlined and are under way. In 1925 a four-year rotation was started comparing a rotation of sunflowers, oats, clover and timothy, (the first crop manured at the rate of 16 tons per acre), with a rotation of oats, clover and two years in timothy. The hay areas in this rotation are fertilized each year with 100 pounds nitrate of soda and 150 pounds 14 per cent slag per acre. These in turn are compared with a check rotation similar to the latter, but receiving no fertilizer.

The results to date are as follows:—

YIELDS OF SUNFLOWERS, OATS AND HAY

Treatment	Yield per acre			Value of crop after deducting cost of fertilizer or manure
	Sunflowers, 2-year average 1925 and 1929	Oats	Hay, average yields	
	tons	bush.	tons	$
4-year rotation—manured 16 tons per acre	13·358	73·26	2·952	172 10
4-year rotation—check	.....	24·67	2·156	111 57
4-year rotation—fertilized	.....	32·80	2·380	118 83

The yields on the manured area have been excellent, sunflowers in 1925 and 1929 yielding 12·91 tons and 13·806 tons per acre respectively. The fertilized rotation is showing slightly better yields than the check to date.

In 1926 a similar rotation was started, excepting that the four-year rotation of sunflowers, etc., was compared with a rotation of oats, clover and two years

in hay, that had an application of 570 pounds of 14 per cent slag when seeded down. The results of the first four years are as follows:—

Treatment	Yield per acre			Value of crop after deducting cost of fertilizer or manure
	Sunflowers	Oats	Hay, average yield	
	tons	bush.	tons	$
Four-year rotation, manured 16 tons per acre	9·73	30·41	2·480	80 01
Four-year rotation, 14% slag 570 pounds per acre	.....	33·00	2·629	107 00

In this experiment the yields on the manured rotation were not as heavy as on the adjacent fertilized area.

Another experiment was started in 1926, to determine the value of manure and commercial fertilizer as top dressing for permanent hay land (marsh). The manure was applied in the fall of 1925 at the rate of 10 tons per acre. In the fall of 1929 the areas were again top dressed with 8 tons per acre. The fertilized areas are top dressed each spring with 100 pounds of nitrate of soda and 150 pounds of basic slag per acre. A check or untreated flat was left in the centre of the block. The results to date are as follows:—

Results from Manure and Fertilizers

Treatment	Yield per acre		Value of crop after deducting cost of fertilizer or manure
	Hay, 1929	Hay, 4-year average	
	tons	tons	$
Manured	2·155	2·339	82 29
Fertilized	2·703	2·894	108 40
Check	2·153	2·027	88 59
Manured	2·530	2·782	101 86
Fertilized	2·734	2·956	111 00

The above experiment has not been under way for a sufficient length of time to draw any definite conclusions.

The cost of renewing marsh lands and their upkeep has been recorded since 1922. Each year up until 1927 a block of old marsh was broken, levelled and ditched. The entire area was completed in 1927 and in 1928, reploughing of the first renewed areas was started. The expenditures and receipts for each block renewed are as follows:—

Cost of Renewing Marsh Sands

Year of renewal	Area	Expenditure to date	Receipts to date
	acres	$	$
1922	9·60	1,480 40	1,680 50
1923	13·00	1,626 37	2,207 84
1924	7·73	1,069 87	1,365 34
1925	11·19	1,682 18	1,523 38
1926	4·70	710 92	551 52
1927	12·51	1,594 67	1,026 92
Totals	59·73	8,164 41	8,355 48
Credit balance	.....	191 07	.....
	.....	8,355 48	8,355 48

DATES OF SEEDING AND HARVESTING, 1929

Crop	Date of first seeding. Field lot	Date of first harvesting. Field lot	Number of days maturing	Stage of maturity when harvested
Turnips	June 18	October 26	130 days	
Sunflowers	June 5	September 12	99 "	75 per cent in bloom.
Corn	June 5	September 21	108 "	Kernels in water stage.
Oats (Banner)	May 19	August 26	99 "	Ripe.
Oats (Gold Rain)	June 4	August 30	87 "	Ripe.
Wheat (Huron)	May 30	September 5	98 "	Ripe.
Wheat (Garnet)	June 5	August 29	85 "	Ripe.
Barley (Charlottetown No. 80)	May 29	August 28	91 "	Ripe.
Clover Hay		July 3		50 per cent in bloom.
Timothy Hay		July 17		Just out of bloom.

SHEEP PASTURE EXPERIMENT 1929

In the spring of 1929 a ten-acre field was divided into five two-acre plots. This field had been in pasture for nearly twenty years and was fairly uniform throughout. Four of these plots were fertilized with 100 pounds of ammonium sulphate, 300 pounds superphosphate and 75 pounds muriate of potash per acre. Three subsequent applications of 50 pounds of ammonium sulphate were applied at intervals of three weeks. The fifth plot was not fertilized.

Plots one to three were rotated each week while plots four and five were pastured continually. The sheep were put on the pasture on June 8 and removed on August 31. An attempt was made to have the live weight per acre as nearly equal on each plot as was possible. It was found that the number of sheep and lambs placed on the pastures on June 8 was not sufficient to keep down the growth of grass, so others were added on July 6. In spite of this, the growth became very rank on the fertilized plots. These were mowed and records taken of the amount of grass removed. Weights were recorded every four weeks of all sheep and lambs in each lot. On August 3 several lambs were removed from each lot, but in spite of this the gains were very low during the month of August. Following are the gains and losses recorded on each lot for each four-weekly period:—

RESULTS OF SHEEP PASTURING EXPERIMENT

Period	Gains per acre					
	Rotated pasture		Continuous pasture, fertilized		Continuous pasture, unfertilized	
	Ewes	Lambs	Ewes	Lambs	Ewes	Lambs
	lb.	lb.	lb.	lb.	lb.	lb.
Period 1	45·8	56·0	55·5	70·5	58·5	66·5
Period 2	−5·0	29·8	6·5	36·0	−18·0	35·0
Period 3	−7·8	11·8	−12·0	−2·5	−19·0	2·0

The secret of good pasturage is an abundance of succulent growth, but closely cropped to keep it palatable and nutritious. Experimental work will be continued in 1930 and sufficient sheep put on to keep the fields closely and uniformly cropped throughout the season, removing such numbers from each field as it is found necessary later in the season.

Following are the data collected during 1929:—

RESULTS OF PASTURE EXPERIMENT, 1929

Items		Rotation fields, fertilized	Continuous pasture fertilized	Continuous pasture unfertilized
Initial weight of ewes per acre	lb.	393	395	386
Final weight of ewes per acre	"	426	445	407·5
Gain of ewes per acre	"	33	50	21·5
Total ewe days per acre	days	255·3	241·5	241·5
Gain per ewe day per acre	lb.	0·129	0·207	0·089
Initial weight of lambs per acre	"	149·8	201	21·7
Final weight of lambs per acre	"	247·5	305	321
Gain of lambs per acre	"	97·7	104	103·5
Total lamb days per acre	days	206·3	279	275
Gain per lamb per day per acre	lb.	0·473	0·373	0·376
Green weight of grass cut per acre	"	4,480	4,764	1,815
Dry matter per acre	"	1,913·1	1,566·1	851
Hay cut (on 15 per cent moisture basis)	"	2,251	1,842·0	1,001
Value of ewe gains per acre at 5 cents per pound	$	1 65	2 50	1 07
Value of lamb gains per acre at 10 cents per pound	$	9 77	10 40	10 35
Total value of gain	$	11 42	12 90	11 42

The number of sheep and lambs placed on these fields at the beginning of the season was as follows: Rotated fields 18 sheep, 15 lambs; continuous pasture fertilized, 6 sheep, 8 lambs; continuous pasture not fertilized, 6 sheep, 7 lambs.

HORTICULTURE

While the snowfall was light and the weather quite changeable, all shrubs and fruit trees came through the winter of 1928-29 in very good condition.

March weather was warmer than usual and the snow disappeared quickly. The lawns became quite green and the buds began to swell, but fortunately did not burst into leaf; otherwise, they would have suffered from the cold, backward weather of April, which on the average was 1 degree below a twenty-one year average temperature of 37·68 degrees F.

The average mean temperature for May was 49·18 degrees, being one degree above a twenty-one year average. Precipitation was recorded on fourteen different dates, together with a snow fall of five inches on the 20th, making a total precipitation up to that date of 4·29 inches. Consequently, very little work was accomplished on the land until the last of the month.

Very dry weather was experienced throughout the months of June, July and August. The soil retained sufficient moisture to effect good germination for all early seedings, but practically all crops suffered from insufficient moisture to aid in the proper growth and development of fruits. The small fruits, such as strawberries and currants, showed this to a most marked degree.

The potato and apple crops both showed the effects of the dry weather, more particularly in the percentage of undersize, unmarketable potatoes and apples.

The flowers that were started in the hotbed and transplanted to the open, made only fair growth, with bloom somewhat below the average. Seed sown in the open was slow in germinating and on the average made only fair growth, with bloom inferior to that of previous years.

The varieties of apples grown in the commercial orchard are for the most part those varieties which are considered best suited to local conditions, such as Yellow Transparent, Duchess and Charlamoff for early market, Pewaukee, Talman Sweet, Wealthy, McIntosh Red, Golden Russet, Northern Spy and Grimes Golden for late varieties.

With good care and cultivation, there should be no difficulty in raising good apples in sufficient quantity to meet local requirements.

The following table gives the financial statement or returns from a small 2½ acre orchard at the Experimental Farm, Nappan, for the season of 1929:—

COST OF COMMERCIAL ORCHARD, 1929

Pruning, 1 man 35 hours at 34 cents		$ 11 90
Gathering limbs, 1 man 6 hours at 34 cents		2 04
Gathering limbs, 1 team 3 hours at 54 cents		1 62
Spraying, 1 man 42 hours at 34 cents		14 28
Spraying, 1 team 27 hours at 54 cents		14 58
Spray material		41 20
Removing trees, 1 man 4 hours at 34 cents		1 36
Ploughing, 1 team 14 hours at 54 cents		7 56
Harrowing, 1 team 3 hours at 54 cents		1 62
Harrowing, tractor 6 hours at $1		6 00
Mowing grass, 1 team 2·5 hours at 54 cents		1 35
Sowing fertilizer, 1 team 3 hours at 54 cents		1 62
1,200 lbs. fertilizer at $50 per ton		30 00
Picking, 158 hours at 34 cents		53 72
240 barrels at 60 cents		144 00
		$ 332 85
To 240 barrels apples	$ 671 26	
Cost	332 85	
Profit over Cost	$ 339 41	

Spray material used for four applications:—
29 gallons lime sulphur at 30 cents.
23 pounds arsenate lime at 88 cents.
49 pounds casinate at 20 cents.
18·8 pounds black leaf 40 at $1.10.

SMALL FRUITS

STRAWBERRIES

The variety test was discontinued for the present and a series of fertilizer tests were started in 1928. The following is an outline of the experiment, also the results obtained during the season of 1929. Insufficient moisture at the proper time resulted in a fairly high percentage of small berries; likewise a decrease in production.

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 September 1.

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

STRAWBERRIES—RESULTS OF FERTILIZER TEST

Series	Date applied	Per cent fall stand	Per cent spring stand	Corrected yields per plot	Corrected yields per acre	Fruit	Foliage
		%	%	lb.	lb.		
1		90·0	87·5	62·60	7,593	Large, light colour.	Light green.
2	June 19, 1928	88·8	86·3	62·46	7,576	Large, light colour.	Dark green.
3	Aug. 1, 1928	90·0	82·5	63·93	7,755	Large, dark red.	Medium green
4	Sept. 1, 1928	88·8	83·8	63·67	7,723	Large, dark red.	Light green.
5	July 1, 1928	93·8	87·5	66·13	8,022	Large, dark red.	Medium green
6	Sept. 1, 1928	93·8	87·5	67·39	8,174	Large, dark red.	Light green.
7	Sept. 1, 1928 Spring, 1929	92·5	83·3	66·03	8,009	Large, light colour.	Medium green

One year's results are not sufficient to permit one to draw any definite conclusions, yet from observations made on the growth and vigour of the plants, it would appear thus far that an application of nitrate of soda and acid phosphate applied the previous year to fruiting is beneficial.

RASPBERRIES

The following table gives the results obtained from the seven varieties grown for 1929:—

Variety	Pickings		Description	Quality	Corrected yield acre
	First	Last			lb.
Newman	July 30	Aug. 21	Large, firm berry...	Good quality.	3,010·2
Herbert	" 30	" 21	Large, firm berry...	Good quality.	2,693·0
King	" 25	" 21	Medium, firm berry	Good quality.	2,566·0
Count	" 30	" 21	Small berry.....	Fair quality..	2,247·8
St. Regis	" 30	" 21	Medium size berry.	Good quality.	1,939·0
Ruby Red	" 25	" 17	Medium size, dark colour.	Good quality.	1,658·8
Cuthbert	Aug. 2	" 21	Medium size.....	Good quality.	1,404·0

All canes showing heavy infestation of mosaic were removed from the plantation during 1928 and it will be necessary to rogue each year to keep a clean plantation. Nursery rows of disease-free canes of Newman, Herbert and Viking were set out during the spring of 1929. These will be used to start a new plantation.

BLACK CURRANTS

The following table gives the yield and description of the ten varieties on test during 1929:—

Variety	Description	Yield per plot of 12 bushes	Yield per acre
		lb.	lb.
Saunders	Large, uniform, good quality	30·0	6,600
Kerry	Very large, uniform, good quality	25·5	5,610
Topsy	Large, uniform, good quality	24·0	5,280
Magnus	Large, uniform, good quality	24·0	5,280
Climax	Large, uniform, good quality	19·5	4,290
Boskoop Giant	Medium size, uniform, good quality	19·5	4,290
Victoria	Large size, uniform, good quality	16·5	3,630
Climax (1373)	Medium size, uniform, good quality	16·5	3,630
Buddenborg	Large size, uniform; medium quality	15·0	3,300
Eagle	Medium size, scattered, medium quality	12·0	2,640
Average		20·3	4,455

RED CURRANTS

The five varieties on test during 1929 gave the following yields:—

Variety	Description	Yield per plot of 12 bushes	Yield per acre
		lb.	lb.
Wilder	Large, uniform, medium quality	109·5	24,090
Perfection	Large, uniform, good quality	109·5	24,090
London Market	Medium to small, uniform, medium quality	103·5	22,770
Cherry	Medium size, uniform, good quality	43·5	9,570
Fay Prolific	Large, uniform, good quality	43·5	9,570
Average		81·9	18,018

GOOSEBERRIES

The following table gives the yields of the ten varieties tested during 1929:—

Variety	Description	Yield per plot of 12 bushes	Yield per acre
		lb.	lb.
Silvia	Large, good quality, attractive	50·38	11,083·6
Joselyn	Large, good quality, attractive	37·38	8,223·6
Barrett	Pointed, medium size, medium quality	21·13	4,648·6
Duncan	Medium size, good quality	19·50	4,290·0
Charles	Medium size, good quality	14·63	3,218·6
Mabel	Large, good quality, attractive	13·00	2,860·0
Rideau	Medium size, medium quality	11·38	2,503·6
Pearl	Medium size, good quality	6·50	1,430·0
Alma	Small size, medium quality	6·5	1,430·0
Deacon			
Average		18·04	3,968·8

The dry season, with lots of sunlight, was a great preventive of diseases, as the fruit was very clean and free from mildew.

VEGETABLES

POTATOES—UNIT STOCK SELECTION

For the past seven years the selection of disease-free Irish Cobbler seed from unit stock has been carried out at this Farm. Stock from fifteen different units were planted in plots of 1/435·6 of an acre each. They were planted on June 11 and harvested on September 23. Three inspections during the year did not reveal any diseased units.

The yields ranged from 148·8 bushels to 199·7 bushels per acre, with an average for the fifteen plots of 171·34 bushels per acre. The results of insufficient moisture were recorded in lower yields and a correspondingly high percentage of small, unmarketable potatoes, but on the average the stock was of good quality and clean. As this stock has been free from disease for several years, it should prove valuable seed for starting a seed stock area. A small quantity of this seed will be available for those wishing to make a start with disease-free seed.

Selections were again made from the unit stock of W, G, M, K and Z for type and uniformity. These were from unit stock of 1928, while Q, P, S and B are new units started in 1929.

The selection from the second year stock gave an average yield of 135·7 bushels of marketable and 41·26 bushels of unmarketable, while the first year's selection gave an average yield of 129·4 bushels of marketable and 42·75 bushels of unmarketable, a total increase of 5 bushels in favour of the second year's selection.

SPROUTING WITH POTATOES

That further information on the relative merits of different methods of handling potatoes might be collected, the following experiment was continued during 1929. The test is divided into three divisions: (*a*) Potatoes that are subjected to subdued light at a temperature of from 40 to 50 degrees F for four weeks; (*b*) Potatoes that have been kept dormant all spring; (*c*) Potatoes taken from the general bins at the time of planting.

Planting was carried out on June 11 in duplicate plots. The following are the results recorded for 1929:—

RESULTS OF SPROUTING POTATOES TEST

Variety	Procedure	Marketable	Unmarketable	Five-year average
		bush.	bush.	bush.
Irish Cobbler	General	135·52	21·78	155·61
"	Subdued	118·58	27·83	159·76
"	Dormant	113·74	22·99	160·25

The potatoes taken from the general bin show quite a marked increase in yield over the other two, but from the five-year average results, the dormant method gives a slightly better yield over the other two methods.

DIFFERENT DATES OF PLANTING POTATOES

The following data were collected on the different dates of planting for 1929:—

RESULTS FROM DIFFERENT DATES OF PLANTING POTATOES

Variety	Date planted	Yield per acre marketable	Yield per acre unmarketable
		bush.	bush.
Irish Cobbler	June 11	112·53	18·15
"	" 17	81·07	22·99
"	" 24	73·81	30·25

The four-year average yield per acre marketable, first planting, is 196·17 bushels, unmarketable, 20·09; 2nd planting, four-year average yield per acre marketable, 168·4 bushels, unmarketable 24·25; 3rd planting, four-year average yield per acre marketable, 164·93 bushels, unmarketable, 26·8 bushels.

All other things being equal, the early planting seems to give the best results. Moreover, it permits the potatoes to ripen up and the digging to be accomplished before the bad weather sets in, in the late fall.

TOMATOES—PRUNING EXPERIMENT

This experiment has for its object a study of the relative merits of pruning tomatoes on the development of ripe fruit. The methods used were to prune one plot to first truss, the second plot to second truss and the third plot to third truss, leaving one plot as a check.

The following are the results obtained from the 1929 plantings:—

RESULTS OF TOMATO PRUNING EXPERIMENT

Variety	Method	Description	Yield per acre	
			Ripe	Green
			bush.	bush.
Alacrity	One stem 1st truss	Rough and checked		60·5
"	" 2nd "	" "		102·8
"	" 3rd "	" "		127·0
"	" not pruned	Poor		163·3
Bonny Best	" 1st truss	Good and smooth		151·3
"	" 2nd "	" "		187·6
"	" 3rd "	" "		235·9
"	" not pruned			248·1

The seed obtained this year was not good. Germination was poor and growth was very slow. The trouble may have been due in part to insufficient moisture, together with the long dry spell throughout June, July and August. Therefore, the fruiting was so late none ripened.

BEETS AND CARROTS—HARVESTING AT DIFFERENT DATES

The object of this test is to study the keeping qualities of beets and carrots when harvested at different dates.

The procedure was to sew all seeds in duplicate plots and harvest a definite number from each plot at intervals of two weeks each, starting August 15 and storing same in dry sand.

The following table gives the data from one year's results:—

CARROTS AND BEETS—RESULTS FROM HARVESTING AT DIFFERENT DATES

Date harvested	Number of roots	Weight at harvest	Loss in weight to January 15	Per cent marketable January 15, 1929	Per cent showing growth at crown
		lb.	lb.	%	%
Carrots—					
Aug. 15, 1928	None fit to pull.				
Aug. 30, 1928	36	8·5	1·2	26·4	36
Sept. 15, 1928	36	13·5	3·5	55·6	36
Oct. 1, 1928	36	14·5	3·0	45·8	14
Oct. 15, 1928	36	16·5	5·5	58·3	7
Beets—					
Aug. 15, 1928	45	20·5	9·3	38·9	1·5
Aug. 30, 1928	45	22·5	9·0	51·1	2·5
Sept. 15, 1928	45	26·5	9·0	52·2	
Oct. 1, 1928	45	32·5	8·0	55·6	2·5
Oct. 15, 1928	45	27·5	7·5	62·2	2·0

BEANS

An experiment on different methods of planting beans was started in 1928 and continued in 1929, the object being to study the relative merits of the hill versus row system.

Four varieties of beans were used, namely, Bountiful (or Early Six Weeks), Yellow Eye Green Pod, Yellow Eye Yellow Pod, and Masterpiece. The same quantity of seed was used in each case. When planting on hills, the hills were 24 inches apart with six seeds per hill. When planting in rows, the rows were 24 inches apart and the seed 6 inches apart in the row.

The following table gives the records taken in 1928 and 1929 together with the average for the two years:—

BEANS—RESULTS FROM PLANTING IN HILLS AND ROWS

Variety	1928		1929		2-year average	
	Hill	Row	Hill	Row	Hill	Row
	bush.	bush.	bush.	bush.	bush.	bush.
Bountiful	46·1	43·90	39·9	33·7	43·0	38·8
Yellow Eye Yellow Pod	34·7	29·04	34·20	25·9	34·5	27·5
Yellow Eye Green Pod	40·4	36·1	31·1	24·8	35·8	30·5
Masterpiece	36·1	34·7	22·9	24·6	29·5	29·6
Average	39·43	35·92	32·03	27·25	35·7	31·6

The hill system gave a slightly better yield than the row system, but there was no appreciable difference in earliness or uniformity of ripening. If the hills are properly planted, the area may be cultivated both ways, which will reduce the cost of hoeing.

BEANS—COST OF PRODUCTION

The following data on cost of production were compiled from a small area, but they should give a fair idea of the possible returns from beans grown in a small way. A yield of 32 bushels of marketable beans per acre is somewhat higher than would be obtained from a large acreage:—

Rent of land		$ 4 00
Machinery		2 85
Manure, 20 per cent of 16 tons 1927, 3·2 tons at $2		6 40
Ploughing, 12 hours at 54 cents		6 48
Harrowing, springtooth, 6 hours at 54 cents		3 24
Harrowing, smooth, 3 hours at 54 cents		1 62
Seed, 50 pounds at 16 cents		8 00
Planting (horse), 4 hours at 54 cents		2 16
Cultivating (horse), 6 hours at 44 cents		2 64
Hoeing, 60 hours at 34 cents		20 40
Harvesting, 20 hours at 34 cents		6 80
Threshing and cleaning, 26 hours at 34 cents		8 84
		$ 73 43
To 32·03 bushels beans at $6 per bush	$ 192 18	
By acre cost of	73 43	
Acre returns over cost of production	$ 118 75	

CELERY—DIFFERENT DATES OF STORING

To obtain data on different dates of storing celery, an experiment was started in 1929.

The procedure was as follows:—

(1) Stored when well matured, but before frost.
(2) Stored after plants had been slightly touched with frost.
(3) Stored after plants had been severely frozen.

To date the last two methods do not appear desirable, as the celery has a tendency to decay very quickly after storage.

FLORICULTURE

The season from the standpoint of a florist was not good. A late spring, followed by a long, dry period, does not permit the grower to obtain that early, vigorous growth which, as a usual thing, insures an abundance of bloom.

The total precipitation for June, July and August was 4·71 inches. During June there were seven light showers, yielding 1·00 inch of rain. Therefore, seeds sown in the open were not only very slow in germinating, but did so very unevenly and with poor growing weather continuing throughout July and August, it was hard to expect the various flowers to make their usual showing, without artificially supplying the needed moisture.

A list of the annuals grown and recommended for this district may be obtained from our annual report of 1928.

GLADIOLI

Thirty new varieties were added to the test, making a total of forty-two varieties tested in 1929. These were planted out on May 30 and, considering the season, they made very satisfactory growth, with some very attractive blooms.

ROSES

Twenty-five varieties were set out in permanent beds on May 24. Very good growth was recorded and the majority of the bushes produced good blooms. Two of them died.

BULBS

Twenty-one varieties of Darwin tulips were planted. Nine were new varieties not previously grown at this farm.

Nine varieties of early tulips and seven of daffodils were grown. These bulbs were all planted the previous fall and mulched for the winter.

Both the Darwins and the daffodils wintered well and made a splendid showing, but the early tulips did not fare so well. Consequently their bloom was not up to par, and the blooms were small and lacked uniformity.

PERENNIALS

All perennials came through the winter in very good condition and notwithstanding the very dry season, fair growth was recorded. While the blooms were not as large as usual, a fair exhibit continued throughout the season.

The following list gives a few of the more hardy varieties which will be found suitable for border planting throughout this district: iris, paeonies, phlox, lilium, lupine, campanula, hemerocallis, boltonia, sweet william, white rocket, spiraea, thermopsis and hollyhock.

CEREALS

CHARACTER OF SEASON

The spring of 1929 was cold and late. The first cereal plots were seeded on May 18 and nothing more was done until six days later, on May 24. Except for a few odd lots, seeding was completed on May 31, these odd lots being seeded on June 4. Germination was fairly rapid and good growth was maintained throughout the season in spite of the fact that there was a great lack of moisture. Very satisfactory yields were obtained, there being very little storm damage, with practically no lodging. Stem rust was very prevalent in the wheat varieties and reduced the yield to a certain extent.

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, twenty-two varieties of wheat, thirty-three of oats and twenty-one of barley were tested in rod rows plots. These plots consist of 5 drills, each 18½ feet long. At harvest time one foot is cut from each end, leaving the rows 16½ 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 is desired, eight plantings appear. The work on oat classification, head selection and hybrid material was continued. The uniform rust nursery with wheat and oats was carried on again in 1929 in co-operation with the Rust Laboratory at Winnipeg.

SPRING WHEAT

Eight varieties of spring wheat were under test in one-one-hundred-and-twentieth acre plots. These were seeded on May 29 and harvested as each variety matured. The standing of the various varieties over a period of seven years is unchanged.

The following table gives the 1929 and average yields for the varieties under test:—

SPRING WHEAT—RESULTS OF VARIETY TEST

Variety	Number of years tested	Average number of days to mature	Yield per acre 1929	Average yield per acre
			bush.	bush.
Early Red Fife, Ottawa 16	7	106·4	34·00	31·89
White Russian	7	108·7	33·75	31·39
Huron, Ottawa 3	7	106·4	35·50	31·28
Marquis, Ottawa 15	7	105·0	34·75	29·11
Ruby, Ottawa 623	7	100·1	31·25	25·43
White Russian, Fredericton	4	107·2	31·50	28·82
Garnet, Ottawa 652	4	97·2	24·25	22·51
Aurore	2	99·0	18·50	24·75

OATS

Seven varieties of oats were tested in 1929 in plots similar to those used for spring wheat. These were seeded on May 30. Victory shows the highest

average yield, although Banner exceeded it in five out of the seven years under test. Gold Rain exceeded Victory in four years out of seven, but is third in average yield. Alaska is an early variety, maturing in a little less than ninety days.

The following table gives the results to date:—

OATS—RESULTS OF VARIETY TEST

Variety	Number of years tested	Average number of days to mature	Yield per acre, 1929	Average yield per acre
			bush.	bush.
Victory	7	101·7	81·62	74·17
Banner, Ottawa 49	7	101·7	88·68	73·48
Gold Rain	7	101·1	82·50	71·11
O.A.C. No. 72	7	101·9	84·71	69·12
Alaska	6	88·5	70·15	63·47
*Laurel (hulless), Ottawa 477	6	96·0	64·85	54·05
Legacy, Ottawa 678	2	93·5	82·50	81·40

*Laurel figured at 34 pounds per bushel.

BARLEY

Three varieties of two-rowed and five of six-rowed barley were under test in 1929. Seeding was done on May 31. Charlottetown No. 80, a two-rowed sort, has given the highest average yield of all varieties that have been tested over a period of years. O.A.C. No. 21 and Chinese are six-rowed varieties with good yielding ability. Himalayan, a hulless variety, is a good yielder, but is very short and weak in the straw, making it difficult to harvest.

The following table gives the 1929 and average results:—

BARLEY—RESULTS OF VARIETY TEST

Variety	Number of years tested	Average number of days to mature	Yield per acre, 1929	Average yield per acre
			bush.	bush.
Two-rowed—				
Charlottetown No. 80	7	96·9	57·19	49·96
Duckbill, Ottawa 57	7	97·3	55·31	40·89
Gold	4	94·7	67·50	43·52
Six-rowed—				
Chinese, Ottawa 60	7	88·6	57·19	44·20
O.A.C. No. 21	7	88·9	49·06	44·13
Himalayan (hulless), Ottawa 59	7	84·9	59·06	45·49*
Star	2	85·5	47·81	48·75
Bearer, Ottawa 475	2	94·0	53·13	51·41

*Himalayan figured at 48 pounds per bushel.

BUCKWHEAT

Twelve varieties and selections were under test in 1929. These were seeded on June 22. The following table gives the 1929 and average results:—

BUCKWHEAT—RESULTS OF VARIETY TEST

Variety	Number of years tested	Yield per acre, 1929	Average yield per acre
		bush.	bush.
Japanese J.	5	35·31	47·94
Grey D.	5	40·94	46·07
Japanese M.	5	37·19	44·32
Grey F.	5	44·37	44·06
Russian H.	5	33·75	43·93
Petrograd	5	33·59	41·15
Silverhull J.	5	25·16	38·85
Tartarian D.	5	29·69	37·94
Tartarian G.	5	29·37	37·19
Rye F.	5	26·09	33·82
Rye A.	5	28·12	33·56
Rye H.	5	22·66	31·78

REGISTERED SEED GRAIN

The production of registered seed grain was continued. There is a good demand for high class seed, particularly of oats and barley and the major part of this will be sold during the spring of 1930 for seed purposes.

FORAGE CROPS

The work carried on in this Division consists of variety tests of swedes, mangels and carrots, and of corn and sunflowers for ensilage purposes. Regional strains of red clover are under test for hardiness, yield and general suitability. Different grass mixtures are being tested for hay and pasture uses, and selection is being carried on with alfalfa for hardy strains suitable for Maritime con-

Variety test of clovers: 1, Sicily; 2, Romagna; 3, Umbrio; 4, Late Swedish; 5, Veneto; 6, Emelia; 7, Altaswede. Purchase only hardy varieties. Seed produced under climatic conditions similar to the district in which it is to be grown will give best results.

ditions. The production of Bangholm club root resistant swede seed is being continued, and an attempt made to produce a strain more uniform in shape and colour. The timothy variety test and annual hay crops were continued in 1929.

Unfavourable weather retarded seeding operations in the spring and the crops in this Division were not seeded until the first week in June. Rainfall throughout the growing season was light, germination was slow and crops yielded below average as a general rule, although the hay crop was good. Harvesting weather was good and crops were stored in good condition.

CROPS FOR ENSILAGE

CORN

Eighteen varieties or strains were tested in 1929. The seed was sown on June 8 and harvesting completed on September 24. Germination was good and growth fair, with slightly below average yields harvested. Over a seven year period North Dakota, Longfellow and Northwestern Dent are leading in the production of dry matter. Several hybrid strains that have been tested for shorter periods are showing up very favourably.

The following table gives the 1929 and average yields:—

CORN, 1929, AND AVERAGE YIELDS

Variety	Source	Number of years tested	Green yield per acre		Percentage dry matter		Pounds dry matter per acre	
			1929	Average	1929	Average	1929	Average
			tons lb.	tons lb.	%	%	lb.	lb.
North Dakota	Steele Briggs	7	16 480	18 250·0	14·325	14·549	4,624	5,219·3
Northwestern Dent	Dakota Improved Seed Co.	7	14 360	16 1,832·7	16·207	15·303	4,598	5,158·7
90 Day White Dent	Dakota Improved Seed Co.	7	14 1,240	18 251·4	14·944	14·474	4,364	5,134·1
Longfellow	Duke	7	15 560	18 1,261·4	14·969	13·504	4,568	4,940·2
Golden Glow	Duke	7	13 1,720	15 1,634·7	15·945	14·844	4,424	4,700·9
Wisconsin No. 7	Duke	7	13 960	15 1,983·7	15·199	14·053	4,088	4,510·3
White Cap Yellow Dent	Steele Briggs	7	16 240	14 1,397·1	15·296	14·893	4,928	4,373·4
Burr Learning	Carter	6	17 760	21 1,426·5	15·177	14·701	5,266	6,363·8
Hybrid	Wimple	6	14 600	19 1,638·8	14·346	14·374	4,114	5,691·7
Compton's Early	Duke	6	.....	19 89·4	.....	13·284	.....	5,081·4
Quebec 28	McDonald College	6	11 1,640	14 537·5	15·668	15·069	3,694	4,971·9
Yellow Dent	Wimple	6	11 1,040	17 234·3	14·431	14·577	3,322	4,961·9
Bailey	Duke	6	13 920	16 1,827·8	15·794	14·723	4,248	4,924·3
Learning	Duke	6	.....	18 304·3	.....	12·531	.....	4,842·0
Northwestern Dent	Brandon	6	8 880	13 472·2	17·332	16·021	2,932	4,270·7
Amber Flint	Wimple	6	11 240	14 1,746·7	15,609	14·126	3,476	4,238·0
Longfellow	Dakota Improved Seed Co.	5	.....	19 1,799·2	.....	13·563	.....	5,387·5
Northwestern Dent, North Dakota grown.	McKenzie	5	12 —	14 1,319·8	16·058	15·701	3,850	4,616·3
Northwestern Dent, Nebraska grown.	McKenzie	4	.....	19 1,368·2	.....	14·820	.....	5,749·5
Pride Yellow Dent	Dakota Improved Seed Co.	4	.....	14 430·8	.....	16·172	.....	4,703·1
Canada Yellow Flint	Dupuy and Ferguson	3	.....	17 755·7	.....	15·328	.....	5,218·1
Wisconsin No. 7	Parks	3	.....	16 1,416·7	.....	13·797	.....	4,709·2
Quebec 28	Dr. Todd	3	.....	12 1,740·0	.....	14·312	.....	3,752·6
Twitchell's Pride x Wisconsin No. 7.	Harrow	2	.....	24 1,383·5	.....	12·688	.....	6,290·8
Longfellow	Popp and Lang	2	17 —	23 1,380·0	13·285	12·910	4,534	6,075·1
Learning Improved	Parks	2	.....	16 1,375·0	.....	15·165	.....	4,948·9
Northwestern Dent, Compkston.	McKenzie	1	.....	17 1,840·0	.....	17·918	.....	6,421·8
Northwestern Dent, South Dakota grown.	McKenzie	1	.....	19 460·0	.....	15·595	.....	5,997·8
Learning	Parks	1	.....	21 —	.....	12·300	.....	5,166·0
Canada Learning	Carter	1	16 1,560	16 1,560·0	14·656	14·656	4,928	4,928·0
Wisconsin No. 7 x Twitchel's Pride.	Summerland	1	15 1,680	15 1,680·0	14·918	14·918	4,720	4,720·0
Twitchel's Pride	Fredericton	1	.....	13 750·0	.....	15·350	.....	4,106·1
Northwestern Dent	McKenzie	1	.....	11 250·0	.....	13·700	.....	3,048·3

SUNFLOWERS

Six varieties were under test in 1929. These were seeded on June 7 and harvested September 13. Mammoth Russian and Russian Giant have outyielded all other varieties in dry matter per acre.

Following are the 1929 and average yields:—

SUNFLOWERS, 1929, AND AVERAGE YIELDS

Variety	Source	Number of years tested	Green yield per acre				Percentage per acre		Pounds dry matter per acre	
			1929		Average		1929	Average	1929	Average
			tons	lb.	tons	lb.	%	%	lb.	lb.
Mammoth Russian	McDonald	7	13	760	24	571·8	18·149	15·669	4,790	7,405·8
Ottawa 76	C.E.F., Ottawa	7	14	920	18	458·0	16·918	14·209	4,840	5,120·2
Manchurian	McKenzie	6	14	1,840	17	592·2	16·880	14·134	5,046	4,774·4
Mixed Mennonite	Rosthern	6	9	600	11	1,957·7	18·523	14·830	3,426	3,501·5
Russian Giant	Dakota Improved Seed Co.	5	.....		24	1,434·0	.....	14·458	.....	7,100·3
Mantica	Canadian Pacific Rys.	3	.....		22	305·7	.....	12·797	.....	5,828·8
Black	Canadian Pacific Rys.	3	.....		21	150·0	.....	13·090	.....	5,505·8
Mixed	Canadian Pacific Rye.	3	.....		20	1,694·3	.....	12·577	.....	5,236·1
Mammoth Russian	Dakota Improved Seed Co.	2	17	560	23	1,200·0	17·324	15·817	5,940	7,251·5
Mammoth Russian	Ewing	2	19	1,680	23	420·0	17·832	15·576	7,082	7,081·4
Manchurian	Canadian Pacific Rys.	2	.....		22	166·5	.....	12·685	.....	5,597·6
Russian Giant	Canadian Pacific Rys.	2	.....		17	125·0	.....	13·265	.....	4,128·2
Mammoth Russian	Canadian Pacific Rys.	1	.....		25	667·0	.....	11·070	.....	5,608·8

ROOTS

MANGELS

Thirty-three varieties were tested in 1929. These were seeded on June 5 and harvesting was completed on October 18. Germination was only fair and the stand was much reduced. Giant Rose Intermediate Sugar is leading in yield of dry matter per acre over period of six years. This is a uniform, smooth sugar mangel. The following table gives the 1929 and average yields of all varieties tested for five years or more:—

MANGEL VARIETY TEST, 1929, AND AVERAGE YIELDS

Variety	Source	Number of years tested	Yield per acre on corrected yield basis						Percentage dry matter		Dry matter per acre	
			1929			Average			1929	Average	1929	Average
			tons	lb.	bush.	tons	lb.	bush.	%	%	lb.	lb.
Giant Rose Intermediate Sugar	Ewing	6	19	1,711·6	794·2	20	1,724·4	834·5	13·190	14·141	5,238·0	5,849·2
Leviathan	Rennie	6	23	926·0	938·5	26	183·5	1,043·7	12·198	11·325	5,724·0	5,760·0
Danish Sludstrup	Ewing	6	19	261·6	765·2	21	1,608·6	872·2	11·855	13·121	4,536·0	5,644·5
Yellow Intermediate	C.E.F	6	20	415·6	808·3	22	340·9	886·8	13·215	12·932	5,341·0	5,579·7
Eckendorfer Yellow	H. Hartmann	6	22	1,770·8	915·4	26	189·3	1,043·8	10·020	10·470	4,586·2	5,398·4
Jumbo	Rennie	6	20	782·8	815·7	24	123·8	962·5	11·425	11·327	4,659·4	5,382·6
Fjerritsler Barres	H. Hartmann	6	26	1,328·8	1,066·6	24	373·1	967·5	10·988	11·217	5,859·8	5,366·5
Perfection Mammoth Long Red	Rennie	6	19	1,396·4	787·9	21	1,104·4	862·1	12·420	12·470	4,893·0	5,335·6
Green Top Half Sugar	H. Hartmann	6	24	474·4	969·5	21	1,661·9	873·2	12·323	12·436	5,973·6	5,322·1
Red Eckendorfer	Svalof	6	23	151·6	923·0	24	786·9	975·7	11·658	10·880	5,380·4	5,321·8
Barres Half Long	Svalof	6	22	345·6	886·9	22	818·4	896·4	12·363	12·057	5,482·4	5,268·0
Yellow Eckendorfer	Svalof	6	26	1,642·8	1,072·7	23	597·1	931·9	11·280	11·411	6,049·8	5,252·4
Long Yellow	Ewing	6	17	1,615·6	712·3	19	1,318·4	786·4	13·395	13·457	4,770·8	5,224·4
Stryno Barres	H. Hartmann	6	24	1,374·4	987·5	24	744·1	974·9	11·233	11·042	5,546·2	5,195·7
Long Red Mammoth	Ewing	6	18	1,448·4	749·0	21	212·2	844·2	12·400	12·577	4,643·6	5,182·9
Barres Oval	Svalof	6	23	268·0	925·4	22	421·3	888·4	11·953	11·465	5,330·4	5,088·9
Yellow Leviathan	Rennie	6	25	384·0	1,007·7	22	596·5	891·9	11·190	11·459	5,638·0	5,010·6
Red Top Half Sugar	H. Hartmann	6	19	1,852·8	797·1	19	927·5	778·5	12·033	12·555	4,795·4	4,781·3
Eckendorfer Red	H. Hartmann	6	22	858·4	897·2	22	844·7	896·9	10·205	10·574	4,577·8	4,655·7
Golden Tankard	Rennie	6	15	1,054·8	621·1	18	454·1	729·1	11·875	12·607	3,687·8	4,612·3
Red Globe	Dupuy & Ferguson	6	16	66·0	641·3	20	111·8	802·2	12·228	11·831	3,921·0	4,611·2
Red Globe	Ewing	6	15	1,101·6	622·0	18	1,560·3	751·2	11·630	12·461	3,617·2	4,602·2
Golden Tankard	Ewing	6	14	1,877·6	597·6	18	1,722·1	754·4	11·778	12·000	3,519·0	4,432·4
Giant Yellow Globe	Ewing	6	19	285·2	765·7	22	922·5	898·4	9·923	9·945	3,799·0	4,420·4
Giant Yellow Globe	Rennie	6	19	1,490·4	789·8	21	1,892·6	877·9	10·753	10·109	4,246·4	4,302·8
Rosted Barres	H. Hartmann	5	.....		.....	24	1,578·0	991·6	.....	11·879	.....	5,729·4
Elevatham Mammoth	H. Hartmann	5	20	1,278·4	825·6	22	1,615·7	912·3	14·463	12·319	5,970·0	5,483·8
Rubra	Svalof	5	19	87·6	761·8	18	1,349·5	747·0	13·290	13·862	5,061·8	5,033·1

SWEDES

Forty varieties were tested in 1929. These were seeded on June 6 and 7. Harvesting was completed on October 23. The following table gives the results to date for all varieties tested for five years or more:—

SWEDE VARIETY TEST, 1929, AND AVERAGE YIELDS

Variety	Source	Number of years tested	Yield per acre on corrected yield basis						Percentage dry matter		Dry matter per acre	
			1929			Average			1929	Average	1929	Average
			tons	lb.	bush.	tons	lb.	bush.	%	%	lb.	lb.
Invicta Bronze Top.	Ewing	6	20	667·6	813·4	29	1,368·8	1,187·4	9·708	9·797	3,948·0	5,775·5
Bangholm	Nappan	6	18	434·0	728·7	24	1,177·3	983·5	11·085	11·759	4,038·8	5,735·4
Hall's Westbury	Ewing	6	21	578·8	851·6	30	984·0	1,219·7	9·433	9·268	4,016·4	5,643·9
Olsgaard Bangholm.	H. Hartmann	6	23	868·0	937·4	29	1,673·0	1,193·5	9·298	9·558	4,357·8	5,592·7
Hall's Westbury	Rennie	6	20	107·2	802·1	27	1,632·0	1,112·6	9,948	9·842	3,989·8	5,444·9
Best of All	Rennie	6	20	1,334·4	826·7	28	520·7	1,130·4	9·300	9·696	3,844·0	5,408·3
Improved Yellow Swedish.	Svalof	6	17	564·8	691·3	27	756·6	1,095·1	10·448	9·906	3,611·4	5,330·1
Bangholm	Ewing	6	19	1,271·6	785·4	26	1,539·4	1,070·8	10·478	9·984	4,114·8	5,265·2
Bangholm	McKenzie	6	20	1,538·8	830·8	26	1,785·6	1,075·7	9·938	9·934	4,128·2	5,223·0
Best of all	Ewing	6	21	1,831·2	876·6	29	35·2	1,160·7	9·250	9·077	4,054·4	5,207·0
Ditmar's	McNutt	6	21	506·8	850·1	29	1,605·3	1,192·1	9·573	8,910	4,029·2	5,196·4
Sutton's Champion Purple Top	Ewing	6	16	1,461·6	669·2	23	1,911·9	958·2	10·438	10·737	3,492·8	5,134·0
Invicta Bronze Top.	Rennie	6	22	1,292·4	905·8	30	247·9	1,205·0	8·370	8·671	3,791·0	5,131·2
Bangholm	Svalof	6	20	1,073·6	821·5	26	20·6	1,040·4	9·540	9·832	3,918·4	5,069·3
Improved Jumbo or Elephant.	Rennie	6	20	1,685·6	833·7	26	1,908·4	1,078·2	8,720	9·103	3,635·0	4,848·4
Hazard's Improved.	Rennie	6	10	1,725·2	434·5	26	1,424·2	1,068·5	9·803	9·166	2,129·8	4·779·0
Kangaroo	Ewing	6	20	884·8	817·7	25	1,845·0	1,036·9	9·503	9·262	3,885·2	4,719·9
Elephant or Monarch.	Ewing	6	20	339·2	806·8	26	552·4	1,051·0	9·893	8·799	3,990·8	4,522·3
Kangaroo	Rennie	6	9	638·4	372·8	23	1,755·9	955·1	10·118	9·585	1,885·8	4,478·9
Sutton's Champion Purple Top	Rennie	5	14	685·6	573·7	28	766·3	1,135·3	9·500	9·481	2,725·2	5,394·6
Kangaroo	Graham Bros.	5	17	4·4	680·1	24	1,145·5	982·9	9·738	10·225	3,311·4	4,987·0
Shepherd Golden Globe.	H. Hartmann	5	12	1,769·6	515·4	24	1,545·9	990·9	9·943	9·833	2,562·2	4,772·1
Magnum Bonum	Rennie	5	19	1,902·8	798·1	26	1,195·0	1,063·9	9·278	9·033	3,702·2	4,702·3
Canadian Gem	Rennie	5	18	72·8	721·5	25	802·6	1,016·1	9·533	9·340	3,438·8	4,673·8

Turnip seed production: This is a good cash crop to grow. The Maritime Provinces could profitably raise sufficient seed to meet the demands of the Canadian turnip seed trade. The average yield at the Nappan Farm, over a period of six years, has been 1,000 pounds at an approximate cost of 20 cents per pound.

CARROTS

Fifteen varieties were seeded on June 7 and harvested on October 28, 29 and 30. The following are the 1929 and average yields:—

CARROT VARIETY TEST, 1929, AND AVERAGE YIELDS

Variety	Source	Number of years tested	Yield per acre on corrected yield basis				Percentage dry matter		Dry matter per acre	
			1929		Average		1929	Average	1929	Average
			tons	lb. hush.	tons	lb. hush.	%	%	lb.	lb.
White Belgian	H. Hartmann	6	15	406·8 608·1	13	1,077·8 541·6	11·650	11·229	3,542·4	3,054·6
Improved Intermediate White.	Ewing	6	16	1,685·6 673·7	15	69·3 601·4	10·508	9·933	3,539·6	3,016·1
Danish Champion	C.E.F.	6	19	1,228·0 784·6	13	1,780·5 555·6	10·548	10·827	4,137·8	3,015·4
White Belgian	Dupuy & Ferguson.	6	13	1,844·0 556·9	14	97·3 561·9	11·730	10·637	3,266·2	3,011·7
Mammoth Short White.	Rennie	6	18	1,396·8 747·9	14	632·8 572·7	10·430	9·966	3,900·4	2,876·7
Large White Belgian.	Rennie	6	17	1,062·0 701·2	13	1,459·5 549·2	11·335	10·367	3,974·2	2,851·4
New Yellow Intermediate.	Ewing	6	14	872·0 577·4	13	379·5 527·6	10·470	10·369	3,022·8	2,749·7
Large White Vosges.	Dupuy & Ferguson.	6	14	1,324·8 586·5	12	472·5 489·4	10·823	10·837	3,173·8	2,662·2
Mammoth White Intermediate.	Rennie	5	18	1,792·8 755·9	16	1,286·6 665·7	10·363	9·813	3,916·4	3,276·5
Yellow Belgian	Ewing	5	15	222·8 604·5	13	1,084·6 541·7	11·895	11·381	3,595·0	3,096·2
White Belgian	Ewing	5	16	150·0 643·0	13	999·6 540·0	10·960	10·712	3,523·6	2,900·0
Champion	H. Hartmann	4	17	1,200·4 704·0	12	35·6 480·7	10·810	11·501	3,805·2	2,759·8
James	D.L.F.	4	10	154·8 403·1	9	1,431·2 388·6	13·038	12·872	2,627·8	2,498·8
Danish Champion.	H. Hartmann	3	16	1,426·0 668·5	16	666·0 653·3	10·998	11·516	3,676·2	3,763·5
Half Long White.	Svalof	3	.....	.....	12	1,975·0 519·5	.....	11·097	.....	2,947·8
New Yellow Intermediate.	Halifax seed Co.	3	.....	.....	10	1,200·0 424·0	.....	12·299	.....	2,631·5
Champion	Svalof	2	14	493·2 569·9	13	1,964·1 559·3	11·388	10·514	3,244·8	2,944·7
White Belgian	Trifolium	2	.....	.....	10	43·0 400·9	.....	11·123	.....	2,218·9
White Intermediate.	Exp. Station, Summerland.	2	.....	.....	11	378·0 447·6	.....	9·728	.....	2,189·8
White Belgian 1207.	Trifolium	1	.....	.....	13	1,033·0 540·7	.....	14·070	.....	3,803·5
White Belgian 9008.	Trifolium	1	.....	.....	15	90·0 601·8	.....	11·210	.....	3,373·1
French White Belgian.	Ewing	1	.....	.....	13	1,907·0 558·1	.....	9·420	.....	2,628·8
Yellow Intsrmediate.	Halifax Seed Co.	1	.....	.....	8	1,262·0 345·2	.....	10·820	.....	1,867·7

GRASSES AND CLOVERS

The testing of grasses and clovers was continued and the results will be published at a later date when more data are available.

The mixtures are cut for two seasons and it does not seem advisable to publish data until the results from the second year's cutting are available.

ANNUAL HAYS

Seven annual hays were tested in 1929. The following table gives the results to date:—

ANNUAL HAYS—1929 AND AVERAGE RESULTS

Kind	Number of years tested	1929		Average	
		Green yield	Hay per acre, 15 per cent moisture basis	Green yield	Hay per acre, 15 per cent moisture basis
		tons	lb.	tons	lb.
Japanese millet	3	11·90	7,136·4	13·53	7,872·9
Teff grass	3	6·80	6,011·6	8·99	6,424·2
Golden millet	3	10·49	7,200·8	9·32	6,240·1
Hungarian millet	3	6·91	6,590·6	5·45	5,208·6
Siberian millet	3	6·47	6,845·3	5·10	5,134·1
Hog millet	3	7·33	5,278·7	7·10	5,087·5
Sudan grass	2	6·05	3,892·0	6·24	3,683·7
Common millet	1	.....	.....	4·31	3,618·7

SWEDE SEED PRODUCTION

The production of Bangholm club root resistant swede seed was continued in 1929. Between 600 and 700 pounds were produced and will be for sale during the spring of 1930. There is a good demand for this seed and the variety seems to be giving satisfaction in many localities where club root is prevalent.

CHEMISTRY

The experimental work with fertilizers was continued in 1929. The results of a number of the experiments are given herein, while the results of others are being withheld until more data are available.

FERTILIZER FORMULAE FOR POTATOES

Four rotations of potatoes, oats and hay have now been completed. When the potato crop alone was considered, results indicated that the greatest returns might be expected from a 1,200 to 1,500 pound application of a formula such as a 3-6-6, 4-6-6 or 4-8-8 mixture. The grain and hay, however, seem to have responded to the heavier applications, due probably to the fact that there would be a larger residue from the preceding crop. The following table gives a four-year average for each crop in the rotation, viz potatoes, oats and hay.

FERTILIZER FORMULAE FOR POTATOES—SUMMARY OF RESULTS OVER FOUR ROTATIONS (2 AREAS 1923–29)

Formulae	Rate per acre	Potatoes—first year in rotation (four crops)								
		Average yield per acre			Average increase over checks per acre			Average cost of fertilizer	Average value of increase over cost of fertilizer	Average profit of formula
		Marketable	Unmarketable	Total	Marketable	Unmarketable	Total			
	lb.	bush.	bush.	bush.	bush.	bush.	bush.	$	$	$
6–6–6	1,000	131·1	29·9	161·0	77·1	11·1	88·2	19 38	22 87	
	1,500	146·2	29·7	175·9	92·2	10·9	103·1	29 01	22 41	24 53
	2,000	170·4	32·4	202·8	116·4	13·6	130·0	38 76	28 32	
5–6–6	1,000	126·6	30·7	157·3	72·6	11·9	84·5	17 30	24 91	
	1,500	148·8	31·9	180·7	94·8	13·1	107·9	25 95	28 63	28 33
	2,000	168·2	31·7	199·9	114·2	12·9	127·1	34 60	31 45	
4–6–6	1,000	127·1	31·0	158·1	73·2	12·2	85·4	15 30	26 96	
	1,500	170·5	31·5	202·0	116·5	12·7	129·2	22 94	43 85	39 42
	2,000	192·5	30·5	223·0	138·5	11·7	150·2	30 61	47 46	
3–6–6	1,000	149·7	28·6	178·3	95·7	9·8	105·5	13 27	40 92	
	1,500	139·7	28·6	168·3	85·8	9·8	95·6	19 90	28 46	38 31
	2,000	179·3	34·0	213·3	125·3	15·2	140·5	26 54	45 56	
5–8–6	1,000	140·4	33·3	173·7	86·4	14·5	100·9	18 79	31 53	
	1,500	143·6	32·8	176·4	89·6	14·0	103·6	28 18	22 94	30 09
	2,000	181·7	33·3	215·0	127·8	14·5	142·3	37 56	35 79	
4–8–6	1,000	135·5	33·1	168·6	81·5	14·3	95·8	16 79	29 39	
	1,500	155·1	30·8	185·9	101·1	12·0	113·1	25 18	31 33	33 34
	2,000	182·2	31·6	213·8	128·3	12·8	141·1	33 57	39 31	
3–8–6	1,000	138·6	31·9	170·5	84·6	13·1	97·7	14 75	34 02	
	1,500	154·7	32·6	187·3	100·8	13·8	114·6	22 13	34 98	37 42
	2,000	181·4	34·4	215·8	127·4	15·6	143·0	29 50	43 25	
4–8–10	1,000	152·0	30·5	182·5	98·1	11·7	109·8	18 59	36 90	
	1,500	177·3	32·5	209·8	123·3	13·7	137·0	27 88	41 94	41 01
	2,000	197·8	32·3	230·1	143·8	13·5	157·3	37 17	44 18	
4–8–8	1,000	139·8	31·6	171·4	85·8	12·8	98·6	17 69	31 10	
	1,500	192·1	31·1	223·2	138·1	12·3	150·4	26 53	50 37	41 14
	2,000	191·0	31·9	222·9	137·0	13·1	150·1	35 37	41 96	
4–8–4	1,000	137·1	29·4	166·5	83·2	10·6	93·8	15 89	31 78	
	1,500	151·1	33·6	184·7	97·2	14·8	112·0	23 83	30 36	31 19
	2,000	165·8	35·7	201·5	111·8	16·9	128·7	31 77	31 43	
Checks		54·0	18·8	72·8						

Fertiliser Formulas for Potatoes—Summary of Results over Four Rotations (2 Areas 1923–29)—Concluded

Formulae	Oats—second year in rotation (four crops)						Hay—third year in rotation (four crops)				Potatoes, oats and hay	
	Average yield per acre		Average increase over checks		Value of increase oats 64 cents per bushel, straw $4 per ton	Average profit of formula	Average yield per acre	Annual increase over checks	Value of increase at $10 per ton	Average profit on formula	Total value of increase for each rotation	Average total value of increase for each formula from each rotation
	Grain	Straw	Grain	Straw								
	bush.	tons	bush.	tons	$	$	tons	tons	$	$	$	$
6–6–6	44·94	0·999	2·20	0·104	1 82		1·395	0·299	2 99		27 68	
	50·47	1·075	7·73	0·180	5 67	5 21	1·492	0·396	3 96	4 63	32 04	34 37
	53·44	1·217	10·70	0·322	8 14		1·790	0·694	6 94		43 40	
5–6–6	47·76	0·955	5·02	0·060	3 45		1·286	0·190	1 90		30 26	
	49·10	1·083	6·36	0·188	4 82	5 54	1·552	0·456	4 56	3 58	38 01	37 45
	53·19	1·309	10·45	0·414	8 34		1·523	0·427	4 27		44 06	
4–6–6	49·04	1·109	6·30	0·214	4 89		1·333	0·237	2 37		34 22	
	53·99	1·079	11·25	0·184	7 94	7 84	1·368	0·272	2 72	3 34	54 51	50 60
	57·42	1·219	14·68	0·324	10 69		1·589	0·493	4 93		63 08	
3–6–6	54·41	1·168	11·67	0·273	8 56		1·348	0·252	2 52		52 00	
	50·29	1·178	7·55	0·283	5 96	7 70	1·339	0·243	2 43	3 73	36 85	49 74
	53·99	1·242	11·25	0·347	8 59		1·720	0·624	6 24		60 39	
5–8–6	49·25	1·080	6·51	0·185	4 91		1·262	0·166	1 66		38 10	
	50·55	1·077	7 81	0·182	5 73	6 58	1·403	0·307	3 07	4 10	31 74	40 77
	54·85	1·234	12·11	0·339	9 11		1·852	0·756	7 56		52 46	
4–8–6	44·41	1·030	1·67	0·135	1 61		1·347	0·251	2 51		33 51	
	47·64	1·018	4·90	0·123	3 63	3 88	1·436	0·340	3 40	4 60	38 36	41 82
	51·31	1·125	8·56	0·230	6 40		1·884	0·788	7 88		53 59	
3–8–6	48·76	1·060	6·02	0·165	4 51		1·238	0·142	1 42		39 95	
	47·49	1·027	4·75	0·132	3 57	4 95	1·418	0·322	3 22	3 74	41 77	46 11
	51·59	1·171	8·85	0·276	6 77		1·753	0·657	6 57		56 59	
4–8–10	49·71	1·066	6·97	0·171	5 14		1·133	0·037	0 37		42 41	
	51·59	1·192	8·85	0·297	6 85	7 36	1·477	0·381	3 81	2 64	52 60	51 01
	56 34	1·245	13·60	0·350	10 10		1·470	0·374	3 74		58 02	
4–8–8	46·48	0·968	3·74	0·073	2 69		1·259	0·163	1 63		35 42	
	51·97	1·193	9·23	0·298	7 10	5 84	1·405	0·309	3 09	3 53	60 56	50 51
	53·21	1·151	10·47	0·256	7 72		1·683	0·587	5 87		55 55	
4–8–4	46·86	0·979	4·12	0·084	2 97		1·201	0·105	1 05		35 80	
	50·60	1·148	7·86	0·253	6 04	5 55	1·418	0·322	3 22	2 91	39 62	39 65
	52·92	1·173	10·18	0·278	7 63		1·541	0·445	4 45		43 51	
Checks	42·74	0·895					1·096					

BASIC SLAG EXPERIMENT

This experiment was started in 1923, making a comparison of some of the phosphatic fertilizers then on the market. Various brands of basic slag then available were included and the results for five years were reported in 1927. Several of these brands of slag have since been removed from the market and the plots that received the various brands of Sydney slag are now being dressed with one brand only, viz., XX Fortified slag. The English and Belgian plots now all receive Belgian slag. Before making the change, swedes were grown on all plots in order to use up as nearly as possible the avaliable phosphoric acid in the soil. Next year the results of a complete rotation will be available for publication.

LIMESTONE, GYPSUM AND HYDRATED LIME

The plan of this experiment permits of a comparison of the influence of magnesian limestone, calcitic limestone, hydrated lime and gypsum. The 1928 report gives the results of one rotation and more data will be published as they become available. In 1929 the germination of the swede crop was very poor, resulting in a crop so lacking in uniformity as to make yields far from comparable. For this reason these yields were discarded.

NITROPHOSKA, CALCIUM NITRATE AND UREA

In 1929 a test was outlined to allow a comparison of nitrophoska (15 per cent nitrogen, 30 per cent phosphoric acid and 15 per cent potash), with a standard mixture prepared from sulphate of ammonia, superphosphate and muriate of potash and furnishing the same amounts of plant food per acre. Treatments in which calcium nitrate (15 per cent nitrogen), and urea (46 per cent nitrogen), are used as sources of nitrogen, were also included. A three-year rotation of potatoes, oats and clover hay is followed.

The following table gives the yields of the potato crop:—

NITROPHOSKA, CALCIUM NITRATE AND UREA TEST WITH POTATOES, 1929

Fertilizer used, with amounts, per acre	Plant food supplied per acre			Yield per acre		Increase over checks		Value of increase
	Nitrogen	Phosphoric acid	Potash	Marketable	Unmarketable	Marketable	Unmarketable	
	lb.	lb.	lb.	bush.	bush.	bush.	bush.	$
Nitrophoska.....267 pounds per acre	40	80	40	65·07	18·67	41·07	6·35	34 13
Sulphate of ammonia..200 "	40	.....	.....	62·40	20·27	38·40	7·95	32 31
Superphosphate.....500 "	.....	80	.....					
Muriate of potash..... 80 "	.....	.....	40					
Nitrophoska.....400 "	60	120	60	73·07	20·80	49·07	8·48	40 95
Sulphate of ammonia..300 "	60	.....	.....	79·47	18·13	55·47	5·81	45 54
Superphosphate.....750 "	.....	120	.....					
Muriate of potash.....120 "	.....	.....	60					
Calcium nitrate.....267 "	40	.....	.....	72·53	19·20	48·53	6·88	40 20
Superphosphate.....500 "	.....	80	.....					
Muriate of potash..... 80 "	.....	.....	40					
Floranid (urea)..... 87 "	40	.....	.....	73·07	23·47	49·07	11·15	41 50
Superphosphate.....500 "	.....	80	.....					
Muriate of potash..... 80 "	.....	.....	40					
Calcium nitrate.....400 "	60	.....	.....	80·53	18·67	56·53	6·35	46 49
Superphosphate.....750 "	.....	120	.....					
Muriate of potash.....120 "	.....	.....	60					
Floranid (urea).....130 "	60	.....	.....	70·93	21·87	46·93	9·55	39 75
Superphosphate.....750 "	.....	120	.....					
Muriate of potash.....120 "	.....	.....	60					
Checks.....	.....	.....	.....	24·00	12·32	.....	.....	.....

Prices used, potatoes marketable 80 cents per bushel
unmarketable 20 cents per bushel.

POULTRY

THE SEASON

The weather was sufficiently mild throughout November and December to permit the birds to make a good getaway on their winter production, but during January the heavy gales and wide fluctuations in temperature were too trying on them and a slight drop in production was recorded, both on the plant and in the contest. However, they soon picked up all lost ground during the fine, bright days of February, and notwithstanding the alternating days of storms and calms of March, they kept up a steady pace and were able to record their highest average production during the nice, warm, springlike days of April. May was another trying month. The weather was not only windy and wet, but very cool. Six inches of snow was recorded on the 20th and a maximum of 82 degrees was recorded on the 29th. Nevertheless the birds kept their average production up to a very satisfactory point. June, July, and August were dry and warm, with production running fairly consistent throughout the period. Weather conditions were fairly favourable throughout September and October, with occasional frost, but it was only natural that the birds at this period would begin to drop in their production, but taking the season on the average, it may be termed a very satisfactory one for the poultry industry.

PEDIGREE BREEDING

The selection of the breeding stock and the proper mating of pens can never be too frequently referred to as two very important phases of poultry husbandry. The unit cost of the commodity depends to a very large extent on the efficiency of the machinery. The hen in this case is the machine, as she takes the raw material and turns it out as a finished product in the form of eggs. Production characteristics are inherited, not acquired. The most expedient way to insure bred-to-lay females of the highest type is by pedigree breeding. By so doing, you are safeguarding the industry to a very high degree. High production of eggs, weighing 24 ounces per dozen and standard of qualifications are two very essential phases in the industry.

At the Experimental Farm, Nappan, N.S., the number of matings made during the spring of 1929 was 202, of which 11 were registered females. Four of these were mated to registered males.

The following table gives a summary of all birds laying over 150 eggs:—

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

From the preceding table it may be noted that our birds are holding their own remarkably well, considering the fact that severe culling of some of the

higher producers has been necessary, owing to the blood test and small eggs. All reactors are disposed of and gradually all females producing small eggs are eliminated from the flock.

FEEDING EXPERIMENTS

The successful breeder has long recognized the importance of paying strict attention to the feeding of the birds, but we believe there are many flocks that would give their owner a very marked increase in production with just a little extra care and thought given to the quality and quantity of feed fed.

Each year feeding projects are carried out at this farm, as well as at all the other experimental farms, in order to supply as many data on this important subject as is possible. The following projects were carried out for 1929: Epsom salts vs. mangels vs. clover vs. sprouted oats as green feeds; beef scrap vs. fish meal as animal protein feeds; oyster shell vs. clam shell vs. gypsum as grit and mineral feeds; hulless oats vs. ordinary oats to determine the relative feeding value of a food low in fibre.

The following table gives the four-year average results from Epsom salts vs. mangels vs. clover vs. sprouted oats:—

MANGELS VS. EPSOM SALTS VS. SPROUTED OATS VS. CLOVER, 4-YEAR AVERAGE

—		Mangels	Epsom salts	Sprouted oats	Clover
Number of days in experiment	No.	182	182	182	182
Number of birds on experiment	"	14·6	15·0	14·95	14·9
Scratch grain consumed	lb.	502·30	507·20	503·75	516·00
Mash consumed	"	159·38	166·90	147·40	175·13
Beef scrap consumed	"	25·9	28·9	23·8	27·6
Mangels consumed	"	503	.....	.....	.....
Epsom salts consumed	"	.....	9·6	.....	.....
Sprouted oats consumed	"	.....	.....	142·8	.....
Clover consumed	"	.....	.....	.....	91·4
Grit consumed	"	10·8	10·3	10·1	11·4
Shell consumed	"	26·5	25·25	28·6	29·6
Total eggs laid	No.	1,172·5	1,181·5	1·223·2	1,185·2
Statement of Cost					
Scratch grain	$	12 84	12 96	12 87	13 19
Mash	$	4 28	4 49	3 98	4 65
Beef scrap	$	1 19	1 37	1 05	1 41
Mangels	$	1 29	.....	.....	.....
Epsom salts	$	.....	0 47	.....	.....
Sprouted oats	$	.....	.....	3 48	.....
Clover	$	.....	.....	.....	0 30
Grit	$	0 18	0 17	0 17	0 19
Shell	$	0 48	0 46	0 51	0 53
Total cost of feed	$	20 26	19 92	22 06	20 28
Total value of eggs laid	$	39 70	40 34	42 20	40 64
Profit over feed per pen	$	19 44	20 41	20 14	20 36
Profit over feed per bird	$	1 33	1 36	1 35	1 37
Feed cost per dozen	$	0 2074	0 2023	0 2164	0 2053

From the preceding table it may be noted that there is very little difference in the four-year average results from use of mangels, Epsom salts and clover in the cost to produce a dozen of eggs, but that sprouted oats are slightly more expensive to use as green feed.

OYSTER SHELL VS. CLAM SHELL VS. GYPSUM

The following table gives the results obtained during the past four years:—

OYSTER SHELL AND GRIT VS. CLAM SHELL AND GRIT VS. GYPSUM, FOUR-YEAR AVERAGES, 1926-1927-1928-1929

—		Oyster shell and grit	Clam shell and grit	Gypsum
Number of days in experiment	No.	182	182	182
Number of birds on experiment	"	14·45	14·5	14·15
Scratch grain consumed	lb.	525·20	512·7	493·25
Mash consumed	"	158·6	153·0	144·62
Beef scrap consumed	"	31·2	25·4	53·0
Oyster shell consumed	"	27·5	.....	.....
Grit consumed	"	9·25	9·0	.....
Clam shell consumed	"	.....	29·45	.....
Gypsum consumed	"	.....	.....	59·25
Roots consumed	"	374·25	374·25	374·25
Clover consumed	"	4·00	4·00	4·00
Eggs laid during experiment	No.	1,081·25	1,097·00	820·70
Statement of Cost				
Scratch grain	$	13 43	13 10	12 61
Mash	$	4 23	4 12	3 87
Beef scrap	$	1 48	1 17	2 54
Oyster shell	$	0 495	.....	.....
Grit	$	0 157	0 153	.....
Clam shell	$	.....	0 418	.....
Gypsum	$	.....	.....	1 18.
Green feed (roots and clover)	$	0 967	0 967	0 967
Total cost of feed	$	20 75	19 93	21 18
Feed cost per dozen	$	0 230	0 218	0 310
Value of eggs laid	$	35 875	37 43	28 19
Profit over feed per pen	$	15 125	17 50	7 01
Profit over feed per bird	$	1 053	1 209	0 496

From a study of the four years results it would appear that oyster shell and clam shell at prices paid and results obtained, have practically equal value as grit and mineral feeds for hens. The gypsum pen was low in production and about 10 cents higher in feed cost per dozen eggs laid.

BEEF SCRAP VS. FISH MEAL

The following table gives the four years' results of this feeding test:—

BEEF SCRAP VS. FISH MEAL, FOUR-YEAR AVERAGE

—		Beef scrap	Fish meal
Number of days in experiment	No.	182	182
Number of birds on experiment	"	14·45	14·25
Scratch grain consumed	lb.	496·3	507·8
Mash consumed	"	123·4	135·4
Beef scrap consumed	"	29·5	.....
Fish meal consumed (fasterfat)	"	.....	21·4
Grit consumed	"	8·5	10·3
Shell consumed	"	29·5	30·5
Green feed consumed—			
Roots	"	387·8	387·8
Clover	"	4·0	4·0
Eggs laid during experiment	No.	1,135·75	1,146·75
Statement of Cost			
Scratch grain	$	12 68	12 97
Mash	$	2 76	3 07
Beef scrap	$	1 33	.....
Fish meal	$	.....	0 78
Grit	$	0 14	0 17
Shell	$	0 53	0 55
Green feed (roots and clover)	$	0 99	0 99
Total cost of feed	$	18 43	18 53
Total value of eggs laid	$	39 00	38 62
Profit over feed per pen	$	20 57	20 09
Profit over feed per bird	$	1 42	1 41
Feed cost per dozen	$	0 217	0 209

From a study of the preceding figures it may be noted that the cost of producing a dozen eggs was slightly lower from the pen receiving fish meal, but the difference is so slight that it is insignificant.

HULLESS VS. ORDINARY OATS

The following table gives the two-year average results:—

HULLESS VS. ORDINARY OATS, TWO-YEAR AVERAGE RESULTS

—		Hulless oats	Ordinary oats
Number of days in experiment	No.	182	182
Number of birds on experiment	"	14·4	14·65
Scratch grain consumed	lb.	543·5	550·0
Mash consumed	"	165·25	163·75
Beef scrap consumed	"	36·5	34·25
Grit consumed	"	7·0	6·25
Shell consumed	"	35·0	30·75
Green feed consumed	"	295·5	295·5
Total eggs laid during the experiment	No.	1,192·0	1,205·5
Average eggs laid per bird	"	82·8	82·3
Statement of Costs			
Scratch grain	$	14 245	14 000
Mash	$	4 605	4 380
Beef scrap	$	1 765	1 650
Grit	$	0 125	0 115
Shell	$	0 615	0 545
Green feed	$	1 110	1 110
Total cost of feed	$	22 465	21 78
Value of eggs	$	37 335	37 685
Profit over feed cost per pen	$	14 870	15 905
Profit over feed cost per bird	$	1 033	1 089
Feed cost per dozen eggs	$	0 226	0 217

EXPERIMENTAL FEEDING WORK CARRIED ON WITH BREEDING STOCK

Six pens were fed under this project during 1929. The object was to study the relative value of different kinds of vitamin foods and their effect, if any, on the fertility and hatchability of eggs, and the livability of chicks hatched. The methods of feeding were as follows:—

Pen 1 received the regular meal and grain ration. In addition they received a wet mash, to which 1 tablespoonful of cod liver oil was added per 12 birds per day.

Pen 2 received the same meal and grain ration and in addition received in their wet mash ½ ounce of finely chopped raw liver per bird per day.

Pen 3 (check pen), received the same meal and grain ration, but no vitamin food.

Pen 4 received the same meal and grain ration as pens 1 and 2, but 10 per cent of bone meal was added to their dry mash mixture. This works out to ½ ounce per bird per day.

Pen 5 received the same meal and grain ration as pens 1 and 2, but in addition received a combination of all three vitamin foods. The amounts of each were reduced to ⅓ of the quantity used singly.

Pen 6 received the same meal and grain ration as pens 1 and 2, but received in addition a combination of cod liver oil and raw liver in the wet mash, using ½ the quantity of each as fed in pens 1 and 2.

The following table gives the average results obtained to date:—

RESULTS OF TEST OF DIFFERENT KINDS OF VITAMIN FOODS

Years average	Average number of birds	Special feed	Period	Eggs set	Fertile	Blood rings	Dead germs	Dead in shell	Hatched	Per cent fertile	Per cent fertile hatched	Per cent total hatched	Dead in 3 weeks	Per cent mortality in 3 weeks
4	15	Cod liver oil	Regular mating	190	133	4	12	52	65	70·0	48·8	34·2	10	15·3
			Males alternated	53	30	0	5	15	9	56·6	30·0	16·9	3	33·3
			Total	243	163	4	17	67	74	67·0	45·3	30·4	13	17·5
4	15	Raw liver	Regular mating	179	128	2	12	51	66	71·5	51·5	36·8	7	10·6
			Males alternated	36	26	1	3	13	9	72·2	34·6	25·0	4	44·4
			Total	215	154	3	15	64	75	71·6	48·7	34·8	11	14·6
4	15	Check	Regular mating	155	78	6	10	32	30	50·3	38·4	19·3	4	13·3
			Males alternated	42	26	0	4	12	10	61·9	38·4	23·8	5	50·0
			Total	197	104	6	14	44	40	52·7	38·4	20·3	9	22·5
3	13	Bone meal	Regular mating	198	128	3	10	40	75	64·6	58·5	37·8	9	12·0
			Males alternated	48	33	0	3	15	15	68·7	45·4	31·2	7	46·6
			Total	246	161	3	13	55	90	65·4	55·9	36·6	16	17·7
2	13	Cod liver oil, Raw liver, bone meal	Regular mating	181	121	2	10	34	74	66·8	61·1	40·8	19	25·6
			Males alternated	37	25	0	3	14	8	67·5	32·0	21·6	3	37·5
			Total	218	146	2	13	48	82	66·9	56·1	37·6	22	26·8
1	11	Cod liver oil, raw liver	Regular mating	56	34	.....	9	13	12	60·7	35·2	21·7	2	16·6
			Males alternated	30	22	.....	0	18	4	70·3	18·1	13·3	0	0
			Total	86	56	.....	9	31	16	65·1	28·5	18·6	2	12·5

It is quite evident from the above results that the addition of vitamine foods will prove beneficial, but as to just which of these are of greatest value is difficult to determine from the data thus far collected. Raw liver so far is showing up remarkably well, but the test has not had a sufficient number of trials to permit definite deductions to be made.

PRODUCTION

The following table gives the production cost data collected for each month from the pullets carried on the main plant of this farm for 1928-29:—

MONTHLY PRODUCTION COST, BARRED ROCK PULLETS, 1928-29

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
1928	No.	No.	$	$	$	$	$
November	15,909	3,077	125 64	58 64	0 229	66 99	0 00369
December	11,085	3,970	165 42	76 03	0 230	89 39	0 00686
1929							
January	8,748	3,492	93 12	71 62	0 246	21 50	0 00830
February	7,379	2,671	77 904	63 49	0 285	14 41	0 00860
March	7,925	4,190	122 21	73 61	0 211	48 60	0 00929
April	7,497	4,234	91 74	65 29	0 185	26 45	0 00871
May	7,315	4,113	89 115	51 18	0 149	37 93	0 00700
June	4,213	2,374	51 44	24 25	0 123	27 19	0 00576
July	3,528	2,099	50 73	23 55	0 135	27 18	0 00668
August	3,403	1,807	49 69	17 475	0 116	32 22	0 00514
September	3,084	1,357	49 76	17 66	0 154	32 10	0 00573
October	3,036	689	25 26	15 365	0 267	9 90	0 00506
	83,122	34,073	992 03	558 17	0 1966	433 86	

Average birds for year, 227·7 (based on bird days).
Average eggs per bird, 149·6.
Cost of feed per bird day per year, $0.0067.
Feed cost per bird, $2.45.
Profit per bird over feed cost $1.905 per bird.

The results given in the above table are based on bird days. The average birds per year was 227·7, based on bird days and the average production was 149·6 eggs. The yearly feed cost was $2.45 per bird or $0·0067 per day. The average profit over feed cost per bird was $1.91. The average feed cost to produce a dozen eggs was 19·66 cents.

The following table gives the results obtained from the Barred Rock hens. The year is divided into three periods. The first period is from November 1, 1928 to February 28, 1929; the second period is from March 1 to June 30, 1929; the third period is from July 1 to September 30, 1929:—

BARRED ROCK HENS—SUMMARY OF PRODUCTION IN PERIODS

Period	Date	Bird days	Total eggs	Market value	Total feed cost	Feed cost per dozen	Profit over feed cost	Feed cost per bird day
		No.	No.	$	$	$	$	
1st	Nov. 1, 1928–Feb. 28, 1929	20,853	1,089	35 394	118 361	1 30	82 967	00568
2nd	Mar. 1, 1929–June 30, 1929	12,721	4,500	108 997	104 176	0 278	4 821	0 00819
3rd	July 1, 1929–Sept. 30, 1929	6,391	2,654	82 504	30 903	0 140	51 601	0 00484
		39,965	8,243	226 895	253 440	0 369	−26 545	

Feed cost per bird day, $0.00634.
Average number of birds, 109·5.
Cost of feed for 1 bird, $2.31.

The average number of birds for the year was 109·5, based on bird days. The average cost of feed per bird for the year was $2.30 or $0·00634 per bird day. The average feed cost to produce a dozen eggs from the hens was 37 cents. The loss over feed cost was 24 cents per bird against a profit over feed cost of $1.91 per bird for the pullets.

LIGHT VS. HEAVY RATIONS FOR BREEDING STOCK

A project was started during this year to study light vs. heavy feeding of the breeding stock and the effect, if any, on the fertility and hatchability of the eggs. As the data only cover one year's work, it is not considered of sufficient value to publish the table. The next annual report will have the results from two years given. However, the results indicate that the heavy feeding of the breeding stock is not a good practice.

The following is a statement of the cost of rearing chicks up to September 30, when the pullets are taken into winter quarters:—

Cost of Incubation, 1929

Total eggs set, 3,413 at 29 cents per dozen		$ 82 48
Total oil used, 99·75 gals at 26 cents per gallon		25 94
		$ 108 42
927 chickens cost	$108 42	
1 chicken hatched cost	0 117	

Cost of Brooding

902 pounds soft coal at $6.70 per ton	$ 3 02
1,428 pounds of hard coal at $16.45 per ton	11 75
200 pounds home starting mash at $2.25 per cwt	4 50
300 pounds Full-o-pep mash at $4.25 per cwt	12 75
225 pounds Full-o-pep scratch grain F at $3.75 per cwt	8 44
46 pounds grit at $1.80 per cwt	0 83
180 pounds small wheat at $2.50 per cwt	4 50
12 pounds charcoal at $4 per cwt	0 48
100 pounds cracked corn at $2.60 per cwt	2 60
200 pounds Full-o-pep coarse chick grain at $3.45 per cwt	6 90
300 pounds Full-o-pep growing mash at $4 per cwt	12 00
1,010 pounds home grown mash at $3.04 per cwt	30 70
300 pounds home grown grain at $2.62	7 86
	$ 106 33

Total chicks put under brooder	927	
Total chicks alive at end of brooder period	800	
Cost of brooding 800 chicks	$106 32	
Cost of brooding 1 chick	0 133	

Range Period June 1, 1929 to September 30, 1929

500 pounds Full-o-pep chick grain at $5 per cwt	$ 25 00
1,000 pounds Full-o-pep scratch grain at $3.15 per cwt	31 15
700 pounds Full-o-pep growing mash at $4 per cwt	28 00
100 pounds Full-o-pep starter at $4.25 per cwt	4 25
500 pounds Lakko mash at $3.40 per cwt	17 00
600 pounds Lakko grain at $3.40 per cwt	20 40
400 pounds Lakko scratch grain at $2.90 per cwt	11 60
64 pounds grit at $2 per cwt	1 28
42 pounds shell at $1.85 per cwt	0 78
5,475 pounds home grain at $2.47 per cwt	135 23
3,870 pounds home mash at $2.50 per cwt	96 75
150 pounds fattening mash at $2.50 per cwt	3 75
Total cost for range period	$ 375 19

Total chickens put on range	800	
Chickens alive at end of period	611	
Cost of 611 chickens	$375 19	
Cost of 1 chicken	0 614	

SUMMARY

Cost of incubation 927 chickens	$ 108 42
Cost of brooding 800 chickens	106 33
Cost of rearing 611 chickens	375 19
Total cost of 611 chicks raised	$ 589 94
Total cost of 1 chick raised	0 966

AVERAGE COST FOR PAST EIGHT YEARS

Year	Total chicks at five months	Total cost	Average cost per chick
		$	$
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
	4,403	3,911 33	0 888

The total chicks raised to five months of age numbered 4,403, at a total cost of $3,911.33 or 89 cents per chick.

Hatching Results for 1929

—	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 for one chick hatched	Total eggs for one chick alive when wing banded
1929 totals	2,850	2,012	70·60	771	27·05	38·32	667	86·51	3·70	2·61	4·27
Hens	1,918	1,387	72·31	499	26·01	35·98	438	87·77	3·84	2·78	4·38
Pullets	932	625	67·06	272	29·19	43·52	229	84·19	3·43	2·30	4·07
Seven-year averages—											
Hens	1,620	1,189	73·09	448	27·66	37·68	347	77·46	4·66	2·65	4·66
Pullets	1,756	1,251	71·24	346	18·82	27·67	235	65·03	7·47	3·62	7·47
Buckeye 1929	2,760	1,961	71·05	747	27·06	38·09	647	86·61	3·69	2·62	4·26
Buckeye (six-year average)	2,594	1,801	69·43	607	23·40	33·70	496	81·71	4·27	2·97	5·23
Prairie State (five years)	552	412	74·64	112	20·29	27·18	70	62·5	4·9	3·6	7·8
1929—											
March	1,161	897	77·26	362	31·18	40·36	327	90·33	3·21	2·48	3·55
April	1,599	1,064	66·54	385	24·08	36·18	320	83·12	4·15	2·76	5·00
May	90	51	56·67	24	26·67	47·06	20	83·33	3·75	2·12	4·50
Averages—											
March (five years)	1,240	912	73·55	272	21·94	29·82	241	88·60	4·56	3·35	5·15
April (six years)	1,600	1,068	66·75	394	24·63	36·89	325	82·49	4·09	2·71	4·92
May (four years)	548	412	75·18	98	17·88	23·79	63	64·29	5·59	4·20	8·70

EGG-LAYING CONTEST

The Egg-Laying Contest has been conducted at this farm for the past ten years. The contest year opens on November 1 and closes on October 24. Beginning with 1928-29 contest, fifty-one weeks will constitute a contest year.

Twenty-two pens were entered in the 1928-29 Contest, made up as follows: ten pens from Nova Scotia, nine from New Brunswick, two from Ontario and one from Quebec.

Each contestant is allowed to send in twelve birds, but two birds remain in the pen as substitutes and are used to replace any bird that may die or be removed for other causes. It is desirable that each contestant keep the pen up to full strength throughout the entire year.

In order to qualify for registration, the birds or bird must be free from standard disqualifications for the breed and lay 200 eggs or more, with an average weight of 24 ounces per dozen, after the first four weeks.

The standing of the pens or the individual is based on points scored each week, month or year. One point is allowed for each egg which weighs 24 ounces to the dozen and a penalty of one-tenth point is deducted for each ounce that the 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; after that, all are recorded on the basis of 27 ounces per dozen. All eggs averaging less than 20 ounces per dozen, ill-shaped or soft shelled eggs are not officially taken into account. Egg weight is such an important factor to-day that it is worthy of our closest attention, particularly at the mating season. It is only a waste of time and money to enter birds in the Contest that lay small eggs.

The contest work is growing in greater favour each year, especially with those who are looking forward to the future of this great industry. The breeders who have developed bred-to-lay flocks are the ones whose stock is in greatest demand to-day. This demand has shown a very marked increase during the past three years and will continue to do so for some time.

The following table gives the names and addresses of each contestant and number of eggs laid for the pen and points scored on egg weight in the 1928-29 Contest:—

RESULTS IN THE 1928-29 CONTEST

Pen No.	Owner and address	Breed	Number of eggs	Total points
1	C. D. Calder, Cowansville, P.Q.	S. C. W. L.	2,113	2,237·0
22	W. H. C. Chambre, Cody, N.B.	S. C. W. L.	1,996	2,117·9
16	L. B. Johnstone, Nashwaaksis, N.B.	B. P. R.	2,002	2,053·0
12	B. Robichaud, St. Charles, Kent Co., N.B.	B. P. R.	1,905	1,991·5
3	Dunning's Poultry Farm, Navan, Ont.	S. C. W. L.	2,119	1,966·4
8	C. A. Brown, New Glasgow, N.S.	W. W.	1,705	1,942·8
18	Experimental Farm, Nappan, N.S.	B. P. R.	1,679	1,849·1
19	W. C. Black, Amherst, N.S., R.R. No. 3	S. C. W. L.	1,857	1,839·9
15	W. S. Smith, Pugwash, N.S.	B. P. R.	1,746	1,839·5
17	Experimental Farm, Nappan, N.S.	B. P. R.	1,770	1,789·1
5	Hillside Orchard Farm, Canning, N.S.	S. C. W. L.	1,842	1,706·7
2	Experimental Station, Kentville, N.S.	S. C. W. L.	1,485	1,682·5
4	D. R. Turner, Preston Road, Dartmouth, N.S.	S. C. W. L.	1,835	1,620·6
10	W. N. Milner, Sackville, N.B.	B. P. R.	1,679	1,596·3
13	G. M. Avard, Sackville, N.B.	B. P. R.	1,685	1,591·5
21	Walter Rose, Brussels, Ont.	S. C. W. L.	1,526	1,550·1
9	H. G. Harrison, St. John, N.B.	S. C. R. I. R.	1,454	1,544·3
11	B. J. Gaudet, St. Joseph, N.B.	B. P. R.	1,567	1,541·3
6	Everlay Poultry Farm, Lewisville, N.B.	S. C. W. L.	1,562	1,432·7
20	Experimental Farm, Nappan, N.S.	B. P. R.	1,416	1,332·4
14	G. M. Avard, Sackville, N.B.	B. P. R.	1,343	1,315·2
7	C. A. P. Johnstone, Dartmouth, N.S.	W. W.	1,249	1,260·2

The 220 birds laid 37,535 eggs, or an average of 170·6 eggs. The 37,535 eggs were laid at a total feed cost of $691, or 22 cents per dozen. The average cost of feed per bird was $3.14, leaving a profit over feed cost of $1.79 per bird.

The highest bird in the 1928-29 Contest was bird No. 168, Barred Rock, owned by L. B. Johnston, Nashwaaksis, N.B., laying 272 eggs and scoring 317·3 points. The second highest was bird No. 229, White Leghorn, owned by W. H. C. Chambre, Cody, N.B., laying 231 eggs and scoring 286·2 points. The third highest was bird No. 31, White Leghorn, owned by Dunning's Poultry Farm, Navan, Ontario, laying 256 eggs and scoring 278·3 points.

The following is a summary of the number of birds entered each year, with the average production for the past ten years:—

SUMMARY OF TEN CONTESTS

Year	Number of birds	Average production of eggs
1919-20	200	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	166·5
1925-26	270	156·5
1926-27	210	170·7
1927-28	190	162·4
1928-29	220	170·6

FEEDING

Briefly the feed mixture and methods of feeding are as follows:—

The grain ration was 200 pounds wheat, 200 pounds cracked corn, 100 pounds of oats, from November 1 to June 12, 1929, at which time another 100 pounds of oats were added to the mixture, so that it was made up of equal parts by weight of wheat, cracked corn and oats.

The dry mash mixture was made up of 100 pounds each of bran, shorts, crushed oats, corn meal and beef meal; 25 pounds of oil cake; 25 pounds of gluten meal; 50 pounds of charcoal and 2 per cent of cod liver oil (12 pounds to the mixture); also 2 per cent or 12 pounds of mineral mixture, mixed as follows: 50 pounds of bone meal, 25 pounds of fine or powdery shell or limestone and 5 pounds of common salt.

The dry mash is placed in hoppers and is before the birds at all times. Likewise coarse beef scrap, grit and oyster shells. Fresh, clean water is supplied every day; also green feed of some kind; fresh-cut clover and grasses in season and mangels and sprouted oats when other green feeds are not available.

Special attention is given to the comfort of the birds, in keeping the houses free from draughts, but well ventilated and above all clean and free from mites. The straw is changed as soon as it becomes damp and soggy. No breeder can afford to neglect any one of the preceding points, if success is the objective.

APICULTURE

The winter of 1928-29 was comparatively mild and characterized by changeable weather, with a light snowfall. The first flight was noted on February 8. From February 27 to March 3 the bees were flying freely. As a consequence it was necessary to feed during April and the early part of May. Willow bloom was plentiful after May 8. Twenty-one colonies were packed in the fall of 1928 and eighteen of these were alive the following spring. One colony was queenless and

was united. The average strength of the seventeen queen-right colonies was 7·6 frames of bees.

The summer was exceedingly dry and while clover bloom was abundant, the nectar content seemed very small, with the result that a very light crop was harvested. The average production per colony, spring count, was 45·4 pounds. Eighteen colonies were packed in two-colony wintering cases in the fall of 1929. The average strength when packed was ten frames of bees.

METHOD OF DETECTING PREPARATIONS FOR SWARMING

The shallow super brood chamber was again used in the detection of swarming preparations. Only two colonies showed any signs of preparation by building queen-cells on the lower edge of the shallow super frames.

One was treated by a separation of queen and brood by dequeening and requeening. No further preparations for swarming were noted.

WINTERING IN DOUBLE-BROOD CHAMBER

Three colonies that were exceptionally strong in the fall of 1928 were wintered with a shallow super of stores above the brood chamber. Two wintered well, but only one produced a surplus of honey during the season of 1929. The data collected were as follows:—

Item	Double brood chamber		Single brood chamber	
	1929	Two-year Average	1929	Two-year Average
Number of colonies wintered	3	5	13	30
Number of colonies—spring count	2	4	11	27
Average strength fall 1928—frames bees	14·3	14·6	8·8	8·9
Average strength spring 1929—frames bees	13	11·5	6·8	7·3
Average production of honey—pounds	36	91·9	47·7	74·4

A comparison was also made between 10-frame Langstroth and 10-frame Jumbo hive bodies. The results were as follows:—

Item	Ten-frame Langstroth		Ten-frame Jumbo	
	1929	Two-year Average	1929	Two-year Average
Number of colonies wintered	13	27	4	6
Number of colonies—spring count	11	24	4	6
Average strength fall 1928—frames bees	8·8	9·0	9	9
Average strength spring 1929—frames bees	6·8	6·6	7	7·7
Average production of honey—pounds	47·7	74·4	43·7	49·9

FINANCIAL STATEMENT

Debit

By Labour in apiary	$ 15 14	
Supplies purchased	52 92	
Queens purchased	8 00	
		$ 76 06

Credit

To 772 pounds honey produced at 18 cents per pound	$ 138 96	
Approximate value of wax produced	4 00	
		$ 142 96
Credit balance		$ 66 90

GENERAL NOTES

A much needed dairy building was constructed during the year. The building is 21 by 36 feet, and divided into five rooms as follows: A work room 12 feet by 19 feet 10 inches; a wash room 10 feet by 10 feet 4 inches; a boiler room 9 by 10 feet; a cooling room 6 feet 4 inches by 10 feet 10 inches and a workmen's lunch room 11 feet 10 inches by 12 feet. The building is only one story, clapboard on the outside and sheathed on the inside, with a cement floor throughout.

All the main barns were painted and one implement shed, during the season, together with the general repairs of all buildings on the place, such as fixing doors, windows and repairs to leaky roofs.

All farm fences were put in good repair during the early spring months and a strip thirty feet wide was cleared out along the line fences through the woods. This not only serves as a slight fire guard, but is a great protection to the wire fence. A new fence, 1,300 feet in all, was built along the south and southeast side of the newly broken field, taking in some 9·5 acres.

The main driveways of the farm were all put in good shape by the use of a road grader.

A farm exhibit was put up at the following fairs: Amherst Winter Fair, Halifax Provincial Exhibition and the Cumberland County Fair at Oxford, N.S.

During the year farmers' clubs from Moncton, Point de Bute, Shinimicas Bridge and the Cumberland County Farmers' Association visited the Farm. Between 3,000 and 4,000 people visited the farm during the year.

The Superintendent and his two assistants, Messrs. Hilton and Cox, attended many fairs, both county and school and acted as judges at many exhibitions. They also attended many club meetings and gave short talks on the experimental work being carried on at this farm.

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