DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
DOMINION EXPERIMENTAL FARMS

EXPERIMENTAL STATION

FREDERICTON, N.B.

REPORT OF THE SUPERINTENDENT

C. F. BAILEY, B.S.A.

FOR THE YEAR 1928

Printed by authority of Hon. W. R. Motherwell, Minister of Agriculture,
Ottawa, 1929

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NOTES ON THE SEASON

The fall of 1927 was wet and open. There was 13 inches of snow on the ground on December 6, 1927, but this was removed by a rain of 0·92 inches on December 8. On December 19 the snow was 10 inches deep but this was partly removed by rain on December 20. During January, February and March, the fields were partly bare and partly covered with from 1 to 4 inches of a mixture of ice and frozen snow. Owing to the light covering the frost went deeper than usual. Nearly all the clover and a large percentage of the grasses on both the hay and pasture lands were winter-killed. There was also severe winter-killing in the strawberry plantations. The orchards came through the winter in good condition. April was cold and backward and the frost was out of only the first six inches of soil at the end of the month.

The ice started to run out of the St. John river in front of the Experimental Station on April 15. As the ice was broken up by high water and had not melted when it started to run, it jammed at a number of places, and some of the ice stayed on the shores until May.

The land dried slowly as the frost was not entirely out until the middle of May. Ploughing was begun on May 1 as compared with April 21 the previous year. The first dates of seeding were: wheat, May 15; oats, May 18; barley, May 15; potatoes, May 10; sunflowers, June 6; and corn, June 5.

Only 0·55 inches of rain fell during the first twenty-three days of May. Crops sown before this date germinated well. The last week of May and the first week of June were wet, and the soil was cold. Seed sown in clay land in that period had a low per cent germination. From July 23 to September 1, 9·49 inches of rain fell. The heavy rains made most fields too wet to cultivate and labour costs of hoed crops were greatly increased, as hand labour was necessary to control weeds.

The hay crop was heavy but poor in quality as there was practically no clover, and, in addition, a large percentage of hay was badly weathered.

Grain was not very well filled and the straw while heavy, lodged badly. There was also considerable loss at harvest owing to shelling and sprouting.

Corn, except when sown on light, well drained land, germinated poorly and was very immature when cut. Roots and potatoes were good crops except in a few places where the land was water logged. Apples were a good crop. Strawberries were a light crop owing to the large number of plants which winter-killed. Other small fruits gave good yields.

Young cattle were housed on October 12 and the sheep on November 10. It was possible to plough nearly every day until November 21. The St. John river froze at the Experimental Station on November 27 but the weather was mild during December and the ice was only 10 inches thick at the end of the month.

TABLE 1—1928 METEOROLOGICAL RECORDS

	Temperature (F.)						Precipitation				Sunshine	
	Mean		Maximum		Minimum		Rain	Snow	Total Precipitation		1928	Average, 15 years
	1928	Average, 15 years	Highest	Mean Maximum	Lowest	Mean Minimum			1928	Average, 15 years		
	°	°	°	°	°	°	in.	in.	in.	in.	hours	hours
January	15·68	12·49	47·0	26·62	−16·0	4·74	2·31	17·0	4·01	3·59	115·45	104·64
February	15·93	14·17	40·0	28·48	−16·0	3·37	0·83	7·0	1·53	2·70	132·25	120·96
March	26·29	26·56	51·0	35·19	− 9·0	17·38	0·98	20·0	2·98	2·82	149·70	148·41
April	39·05	40·20	70·0	49·36	10·0	28·73	3·69	7·5	4·44	3·28	177·20	159·36
May	53·27	50·97	76·0	65·00	28·0	41·54	2·44	.....	2·44	2·38	187·30	199·25
June	58·8	60·15	79·0	69·9	38·0	47·73	3·77	.....	3·77	3·29	204·6	206·94
July	66·77	66·55	85·0	77·03	45·0	56·51	4·45	.....	4·45	3·07	230·8	218·50
August	65·22	63·98	91·0	73·93	44·0	56·51	6·34	.....	6·34	3·86	166·1	203·49
September	53·84	56·01	75·0	63·21	30·0	44·46	3·02	.....	3·02	3·30	146·5	167·54
October	45·2	46·13	68·0	54·4	19·0	36·0	3·00	.....	3·00	3·66	144·4	146·51
November	31·43	32·70	59·0	39·23	− 1·0	28·63	1·88	4·0	2·28	2·88	113·1	90·76
December	25·14	19·39	51·0	33·38	− 4·0	16·9	2·52	10·0	3·52	3·06	105·4	90·98
1928	41·39	.....	.....	.....	.....	.....	.....	.....	41·78	.....	1,872·80	.....

ANIMAL HUSBANDRY

The work carried on under this Division consisted of breeding and feeding experiments, cost of production and demonstrational work.

CATTLE

There were twenty-nine Ayrshires, sixteen Holsteins, and one Grade at the Station on January 1, 1929.

An Ayrshire bull, Ottawa Supreme 39 —113001—, was obtained from the Central Experimental Farm. Fifteen Ayrshire females and one Ayrshire bull calf were obtained from the Lennoxville Experimental Station. A Holstein bull, Prince Colanthus Francy —58693—, and four Holstein females were purchased from J. Walter Jones, Charlottetown, P.E.I.

Notwithstanding these additions, the herd is smaller than usual owing to:—

(1) The slaughter and disposal of the animals which gave positive reactions to the contagious abortion tests conducted for experimental purposes in co-operation with the "Health of Animals Branch";
(2) The disposal of the grade herd used in the feeding experiment "The Comparison of Methods of Rearing Cattle in New Brunswick";
(3) The disposal of the Shorthorn herd;
(4) The disposal of the work oxen that had been used for clearing land.

SUMMER FEEDING

In order to determine the merits of close grazing, alternating pastures and heavy applications of nitrogenous fertilizers, a pasture improvement experiment was started at the Station this year. A 13⅓ acre field was divided into four fields of equal acreage. On April 28 all fields were given an application of 50 pounds sulphate of ammonia, 350 pounds superphosphate and 100 pounds potash per acre. Fields 1 and 2 were given an application of 125 pounds nitrate of soda per acre on May 10 and field 4 was given an application of 125 pounds nitrate of soda per acre on May 29. Fields 1, 2 and 4 were each given an additional application of 100 pounds nitrate of soda per acre when the cows were

removed from these fields for the first time. The dates of this last application were: field 1, May 30; field 2, June 2; field 4, June 4. Field 3 which was used as a check was not given an application of nitrate of soda.

The cattle were only allowed in one field at a time and when it was closely grazed they were moved to the next field and the grazed field had a rest until the other three fields were grazed. The length of time which the cows remained on any field depended entirely on the amount of herbage and varied from three to six days.

This field carried an average of 1·13 cows per acre from May 26 to October 8. This was a much greater stock carrying capacity than the field had on previous years and in addition this system of pasturing made it possible to turn the cows to pasture a week earlier in the spring than usual. The cows also maintained their milk flow better than usual during the summer although they were fed less grain and were not fed any roughage until October 1 when they were fed hay. In order to maintain the milk flow in 1924, 1925, 1926 and 1927, it was necessary to start feeding green feed on August 1, July 21, August 11, and August 1, respectively.

The fresh green grass had an extremely laxative effect upon the cows at each change of pasture but this did not appear to affect the milk flow.

This field maintained all the pure-bred cows in heavy milk which were milked twice each day. The pure-bred cows which were milked three times each day were not pastured in this field. Pure-breds nearing the end of their lactation period and the grade cows were not pastured in this field either except at times when the growth became so rank that it was necessary to increase the number of cattle in order to keep the field closely grazed.

The rains were timely last season and all pastures were better than usual. Therefore, this year's work does not indicate the carrying capacity of this pasture during a summer with unfavourable pasture conditions. Dividing the pasture into a number of fields and grazing them alternately furnished the cattle with better and cleaner grazing. The amount of fertilizer which can be used profitably cannot be estimated until more work has been done on this project. This experiment will be continued next summer.

WINTER FEEDING

The roughage ration for the winter consisted chiefly of corn silage, swedes, and mixed clover and timothy hay. A small quantity of other feeds, such as sunflower silage, oats and pea silage, and mangels were fed, but they were not considered the main feed.

The meal ration varied at times owing to the nature of the feeds on hand but consisted for the most part of bran one part; crushed oats one part; brewers' grains, two parts; and oilcake, one part. One per cent of salt and one per cent of bone char were added at mixing.

DAIRY HERD RECORDS

Table 2 shows the milk records of all the milch cows that finished a lactation period during the year 1928. For heifers with their first calf, feed is charged from date of freshening. For cows with previous lactation periods, feed is charged for the period during which they were dry before beginning the lactation period here recorded. The following prices were charged for feed:—

Hay	$ 8 61 per ton
Roots	2 70 per ton
Ensilage	4 02 per ton
Green feed	4 25 per ton
Meal mixture	45 00 per ton
Pasture	2 00 per month

TABLE 2—INDIVIDUAL MILK RECORDS COMPLETED DURING THE YEAR

Name of cow	Age at beginning of lactation period	Date of dropping calf	No. of days in lactation period	Total milk for period	Daily average yield of milk	Average per cent fat in milk	Butter produced in period	Value of butter at 40c. per pound	Value of skim-milk at 20c. per cwt.	Total value of product	Amount of meal eaten at $2.25 per cwt.	Amount of roots at $2.70 per ton and ensilage at $4.02 per ton	Amount of hay eaten at $8.61 per ton	Amount of green feed at $4.25 per ton	Amount of beet pulp at $49.50 per ton	Months on pasture at $2.00 per month	Total cost of feed for period	Cost to produce 100 lb. of milk	Cost to produce 1 lb. butter skim-milk neglected	Profit on 1 lb. butter skim-milk neglected	Profit on cow during period labour and calf neglected
	years			lb.	lb.	p.c.	lb.	$ cts.	$ cts.	$ cts.	lb.	lb.	lb.	lb.	lb.	months	$ cts.	$ cts.	cts.	cts.	$ cts.
Ayrshires																					
Fredericton Pansy B.	3	June 14/27	317·5	8,462·9	26·65	3·72	370·40	148 16	16 30	164 46	2,233	R-4,620 E-4,170	2,871	640	.....	3·87	86 32	1 02	23·3	16·7	78 14
Ottawa Folly 2nd.	4	May 2/27	324·5	8,288·4	25·54	3·73	363·40	145 36	15 96	161 32	2 668	R-4,620 E-4,805	3,815	640	126	4·32	105 47	1 27	29·0	11·0	55 85
MacPine Pearl....	6	Mar. 3/28	265·5	7,742·9	29·16	3·48	317·19	126 88	14 95	141 83	2,662	R-7,640 E-2,000	3,685	.....	350	4·53	107 81	1 39	34·0	06·0	34 02
Fredericton Spottie.	2	Sept.30/27	280·0	7,214·0	25·76	4·05	343·52	137 41	13 84	151 25	2,336	R-4,979 E-4,050	3,306	.....	.....	1·71	85 07	1 18	24·8	15·2	66 18
Fredericton Pansy	4	Nov.21/27	301·0	7,179·1	23·85	3·84	324·65	129 86	13 81	143 67	2,451	R-4,220 E-4,130	3,306	.....	.....	5·38	94 14	1 31	29·0	11·0	49 53
Fredericton Starlight	3	Sept.21/27	315·0	6,308·1	20·03	3·94	292·67	117 07	12 12	129 19	2,194	R-3,961 E-4,630	3,348	120	.....	6·55	91 80	1 46	31·4	08·6	37 39
Average for Breed	.....	.....	300·6	7,532·6	25·06	3·78	335·31	134 12	14 50	148 62	2,424	R-5,007 E-3,964	3,389	233	79	4·39	95 10	1 26	28·4	11·6	53 52
Holsteins																					
Fredericton Echo Lee Keyes.		Jan. 26/27	371·0	14,683·9	39·58	3·05	527·59	211 04	28 47	239 51	3,427	R-12,800 E-3,540	3,580	640	231	4·32	132 64	0 90	25·1	14·9	106 87
Fredericton Cheer Echo.	2	Mar. 5/28	297·0	14,279·0	48·07	2·74	461·06	184 42	27 77	212 19	2,977	R-8,290 E-1,150	2,534	.....	350	4·20	108 45	0 76	23·5	16·5	103 74
Fredericton Helen	3	July 22/27	379·5	13,239·2	34·89	3·14	488·54	195 42	25 65	221 07	3,100	R-5,681 E-5,800	3,400	640	.....	4·97	115 19	0 87	23·6	16·4	105 88
Fredericton Lee Johanna.	3	Oct. 30/27	279·0	9,786·2	35·08	3·27	376·62	150 65	18 93	169 58	2,942	R-4,648 E-5,030	3,468	84	.....	4·23	106 15	1 08	28·2	11·8	63 43
Fredericton Johanna Alcartra.	2	Nov. 3/27	343·0	9,418·2	27·46	3·41	378·07	151 23	18 19	169 42	2,984	R-4,322 E-4,050	3,267	.....	.....	4·50	104 17	1 11	27·6	12·4	65 25
Fredericton Frances.	3	Mar. 6/28	262·0	7,062·5	25·04	3·09	257·00	102 80	13 69	116 49	2,282	R-5,660 E-2,940	3,734	.....	.....	4·50	89 97	1 27	35·0	05·0	26 52
Fredericton May Echo Segis.	2	Sept. 6/27	332·5	6,534·4	19·65	3·67	281·80	112 72	12 59	125 31	1,900	R-4,579 E-4,080	3,306	.....	.....	3·44	78 24	1 20	27·8	12·2	47 07
March Echo Segis	6	Aug. 5/27	206·0	5,030·0	24·18	2·88	170·39	68 16	9 77	77 93	1,370	R-2,730 E-5,670	3,516	640	.....	4·32	71 06	1 41	41·7	01·7	6 87
Average for Breed	.....	.....	313·5	10,042·2	30·0	3·12	367·63	147·06	19 38	166 44	2,623	R-6,044 E-4,034	3,351	251	73	4·31	100 73	1 01	27·4	10·1	73 43
Shorthorns																					
Kentville Victoria 8th.	4	April10/27	274·0	5,941·0	21·68	4·01	280·19	112 08	11 41	123 49	2,144	R-4,790 E-4,780	4,009	240	196	4·32	95 58	1 61	34·1	05·9	27 91
Fredericton Susan	3	Oct. 25/27	261·5	4,128·3	15·79	3·71	180·33	72 13	7 95	80·08	1,466	R-3,360 E-3,530	3,409	.....	.....	3·81	66 93	1 62	37·1	02·9	13 15
Average for Breed	.....	.....	267·8	5,034·7	18·74	3·89	230·26	92 11	9 68	101 79	1,805	R-4,075 E-4,155	3,709	120	98	4·07	81 26	1 61	35·3	04·7	20 53

R—Roots. E.—Ensilage.

These values represent the cost of production of hay, roots and ensilage for 1927, and the prices paid in 1928 for carload lots, plus a small charge for hauling from car to barn, and mixing of the grains which make up the meal mixture.

Only the milk records of cows which completed their lactation periods during the year are given. This eliminated the milk records of all the highest producers as these cows reacted to the contagious abortion test and were slaughtered when their lactation periods were practically completed.

COST OF REARING DAIRY HEIFERS

Calves were fed whole milk until three to four weeks of age, then they were gradually changed to skim-milk. A fat substitute was added to the skim-milk. The fat substitute fed until the calves were three months of age was composed of one part flax seed and four parts crushed oats with the hulls sifted off. For the older calves one part of crushed oats was replaced by corn meal. Each calf was fed from one-quarter to one pound of this fat substitute per day, the amount fed depending upon the age and condition of the calf. The calves were also fed hay, roots, and dry grain as soon as they would eat them. The composition of this dry meal mixture varied slightly at times owing to the nature of the feed on hand, but was mainly made up of three parts bran, two parts crushed oats, one part oilcake, and one part brewers' grains. The aim in feeding was to keep the calves growing and to avoid a setback.

Yearling and two-year old heifers were turned to pasture on May 26. They were wintered on hay, roots and silage, together with a grain ration of from two to four ponuds, depending upon the condition of the animal. The feed costs are shown in table 3.

TABLE 3.—COST OF RAISING DAIRY HEIFERS

Average Cost of Feed—Birth to one year for six heifers

(2 Ayrshires, 3 Holsteins, 1 Shorthorn)

—	Amount of feed consumed	Cost of feed
	lb.	$
New milk at $40 per ton	409	8 18
Skim-milk at $4 per ton	3,394	6 79
Fat substitute at $70 per ton	161	5 64
Dry meal at $42 per ton	756	15 88
Turnips at $2.70 per ton	1,445	1 95
Ensilage at $4.02 per ton	1,098	2 20
Hay at $8.61 per ton	961	4 14
	days	
Pasture at 1·5 cents per day	84	1 26
Average cost of feed per head	.....	46 04
	lb.	
Average weight at 1 year	633	

Average Cost of Feed—One to two years for three heifers

(1 Ayrshire, 2 Holsteins)

	lb.	$
Dry meal at $42 per ton	538	11 30
Turnips at $2.70 per ton	2,270	3 06
Ensilage at $4.02 per ton	3,208	6 45
Hay at $8.61 per ton	2,415	10 40
	mos.	
Pasture at $2 per month	4·28	8 56
Average cost of feed per head	.....	39 77
	lb.	
Average weight at 2 years	912	

Cost of Feed—Two years to calving at two years, 310 days for one heifer (Holstein)

	lb.	$
Dry meal at $42 per ton	293	6 15
Turnips at $2.70 per ton	1,975	2 67
Ensilage at $4.02 per ton	2,505	5 04
Hay at $8.61 per ton	2,407	10 36
	mos	
Pasture at $2 per month	4·32	8 64
Total cost of feed	.....	32 86
	lb.	
Weight 10 days after calving	1,133	

THE COMPARISON OF METHODS OF REARING CATTLE IN NEW BRUNSWICK

The feeding experiment comparing scanty with liberal feeding for dairy heifers was completed during the year.

The object of this experiment was to study the effect that feeding dairy heifers a scant ration as compared with a liberal ration would have on cost of rearing, rate of growth, earliness of maturity and value as milk producers.

The results of this experiment will be published in a bulletin shortly.

HEAVY VERSUS LIGHT FEEDING OF SWEDES TO MILCH COWS

An experiment was begun on December 20, 1927, testing the effect of "Heavy versus Light Feeding of Swedes." The experiment is being repeated this year and the results will be published when more data accumulate.

SHEEP

The flock on December 31, 1928, consisted of one aged ram, one ram lamb, twenty-four ewes and eighteen ewe lambs.

CONTROL OF PARASITES

EXTERNAL.—The flock was dipped in Cooper's Dip in the spring and again in the fall. This treatment gave excellent results.

INTERNAL.—The flock was treated for stomach worms and tape worms with copper sulphate-mustard drench according to directions given on page 6 of Bulletin No. 337 of the Ontario Department of Agriculture. Dr. Stevenson, who has edited this bulletin, believes that approximately 75 per cent of the sheep in Eastern Canada are infected with internal parasites. A summary of the method of making and administering the copper sulphate-mustard drench as outlined in the bulletin is as follows:—

"Dissolve 4 ounces of copper sulphate in 2 quarts of hot water, then add 4 ounces of mustard and add 2 gallons more water. This quantity is enough for 100 sheep, treating once and allowing for waste. The dose of this copper sulphate-mustard drench is as follows:—

Adult sheep, 3-4 fluid ounces.
Lambs 2-6 months old, 1-1½ fluid ounces.
Lambs 6-10 months old, 1½-2 fluid ounces.
Lambs 10-12 months old, 2-2½ fluid ounces.

"Measure accurately and keep well mixed. Starve sheep for at least eighteen hours before giving drench and do not feed or water for at least four hours after drenching. Separate lambs from ewes for six hours before being dosed and do not allow back with ewes for two hours after drenching."

In order to avoid casualties the following suggestions regarding drenching are given: "Keep the sheep on its feet, use a small necked bottle or fit a metal tube to a nursing bottle that is marked off in ounces, do not raise the sheep's mouth above the level of its eye, nor raise the head too high, give it time to swallow, treat gently and have other sheep in sight close by. Dosing sheep that have not been starved for eighteen hours is just waste of time and material. Lambs two months old can be drenched with the copper sulphate-mustard drench."

TREATMENT OF PREGNANT EWES WITH IODIZED SALT

In order to ascertain whether ewes would have stronger lambs if fed iodized salt during their pregnancy, approximately one-half of the ewes at the Station had access to iodized salt and one-half had access to common salt during the winters of 1926-27 and 1927-28. This iodized salt was prepared by drying the moisture out of 50 pounds of common salt and then sprinkling it with 2 ounces of potassium iodide dissolved in water. The first year iodized salt did not appear to have any effect. This year, however, the ewes which had access to iodized salt had stronger lambs than the ewes which had access to common salt. The experiment will be continued.

MAINTENANCE OF FLOCK

The sheep were housed on November 11, 1927, and went to pasture on May 19. From November 20 until March 1, the ewes were carried on hay and roots. From March 1 the ewes were fed 1 pound of grain each day. After lambing the grain ration fed to the ewes was gradually increased, while the young lambs had access to the grain fed their dams and were also fed grain in a creep. The shearlings were fed one-half a pound of grain each day from the time they were housed until May 10, 1928.

The breeding ewes sheared an average of 8·22 pounds, the shearling ewes sheared an average of 7·48 pounds and the ram sheared 12·31 pounds.

Six ewes and six lambs were kept at the Station to test the stock-carrying capacity of slagged versus unslagged pastures. The main flock was pastured at the Fredericton golf course. The lambs at the golf course weighed an average of 8·1 pounds at birth, 28·3 pounds on May 21, 34·9 pounds on June 1, 54·6 pounds on July 2, 66 pounds on August 1, and 75·2 pounds on September 1.

HORSES

On January 1, 1929, there were twenty horses in stock, including twelve pure-bred Clydesdales, two pure-bred French Canadians, four Grade Clydesdales, and two general-purpose horses.

One pure-bred Clydesdale horse foal was born during the year. As a preventive of joint ill the pregnant dam was given a teaspoonful of potassium iodide on the first and fifteenth of each month. The foal showed no indication of joint-ill.

The grain ration for work horses consisted of a mixture of oats and bran. The percentage of bran varied according to the character of the work. The horses worked a total of 20,528 hours during the year. Eight heavy horses worked a total of 15,462 hours during the year. The cost of feed and horse-shoeing for these eight horses was as follows:—

25 tons 1,824 pounds of hay at $8.61 per ton	$	223 10
1,040 bushels 23 pounds oats at 66·5 cents per bushel		692 05
2 tons 1,269 pounds bran at $34.50 per ton		90 89
1 ton 618 pounds roots at $2.70 per ton		3 53
Horse-shoeing at $3 for new shoes and $1.75 for changing shoes		152 32
Total cost (labour, interest, depreciation and drugs neglected)		1,161 89
Number of hours worked		15,462
Cost of horse labour per hour	$	0·075

FEED COST OF RAISING YOUNG HORSES

Table 4 gives the cost of feed for Princess from 6 months to 2 years, and for Dick from 6 months to 1 year. Princess was 5 months and 11 days, and Dick, 6 months of age when weaned. Until weaned each foal had access to the feed fed their dam both when at pasture and when in the stable. Therefore, records could not be kept of the feed consumed by these foals the first six months.

TABLE 4.—FEED COST OF RAISING YOUNG HORSES

Item		Six months to one year	Six months to two years
		Dick	Princess
Oats	lb.	538	1,928
Bran	lb.	523	880
Hay	lb.	1,467	4,136
Roots	lb.	.....	95
Pasture	months	.....	6·55
Weight at beginning of period	lb.	.....	585
Weight at end of period	lb.	830	1,100
Gain in period	lb.	.....	515
Statement of Costs			
Oats at $39.12 per ton	$	10 52	37 71
Bran at $34.50 per ton	$	9 02	15 18
Hay at $8.61 per ton	$	6 32	17 81
Roots at $2.70 per ton	$	.....	0 13
Pasture at $2 per month	$	.....	13 10
Total cost of feed	$	25 86	83 93

Table 5 gives the cost of feed for the three Clydesdale mares from birth to three years, also average cost from birth to three years for the last nine horses raised at the Station.

TABLE 5.—FEED COST OF RAISING YOUNG HORSES

(Birth to three years)

Item		Grace	Duchess	Beauty	Average for nine horses
Oats	lb.	4,468	5,216	4,151	4,712
Oatmeal	lb.	.....	.....	71	8
Bran	lb.	1,578	1,821	1,542	1,450
Hay	lb.	7,702	8,181	7,423	8,468
Roots	lb.	844	752	579	630
Pasture	months	13	13	13·2	11·1
Molasses	gal.	2	4	4	1·6
Weight at end of period	lb.	1,430	1,325	1,365	1,402
Statement of Costs					
Oats at $39.12 per ton	$	87 39	102 02	81 19	92 17
Oatmeal at $4.17 per 100 pounds	$	.....	.....	2 96	0 33
Bran at $34.50 per ton	$	27 22	31 41	26 60	25 01
Hay at $8.61 per ton	$	33 16	35 22	31 96	36 45
Roots at $2.70 per ton	$	1 14	1 02	0 78	0 85
Pasture at $2 per month	$	26 00	26 00	26 40	22 20
Molasses at 30 cents per gallon	$	0 60	1 20	1 20	0 48
Total cost of feed	$	175 51	196 87	171 09	177 49

SWINE

The breeding herd of swine at this Station on December 31, 1928, numbered thirteen head, consisting of two pure-bred Yorkshire boars and eleven pure-bred Yorkshire sows. The aged boar "Ottawa Alexander 239" —120064— has been retained as senior herd sire. The two-year-old boar "Charlottetown Boy" —114974— was transferred to the Nappan Station and was replaced by a young boar purchased from the Brandon Mental Hospital. This boar "Brandon A F 336" —130240— will be used on daughters of the senior boar "Ottawa Alexander 239" of which seven have been retained in the Station's breeding herd.

During the year four weanling boars, one aged boar, seven weanling sows, two gilts and three mature sows were disposed of for breeding purposes. These were all pure-bred Yorkshires. In addition, thirty-nine pure-bred pigs the progeny of four sows were fed in connection with the advanced registry project.

FARROWING RECORDS

The spring farrowing record was not as good as last year. Six brood sows rising three years of age and one sow rising one year of age farrowed 93 pigs or an average of 13·28 pigs per litter.

TABLE 6—FARROWING RECORDS

Sow number	Date of birth	Farrowing date	Number of pigs in litter	Number reared
159	April 12, 1925	April 10, 1928	16	11
157	April 12, 1925	April 10, 1928	14	9
153	April 5, 1925	April 19, 1928	12	12
152	April 5, 1925	April 23, 1928	11	9
8	April 12, 1927	April 18, 1928	10	8
76	March 21, 1925	April 14, 1928	17	8
221	January 18, 1925	April 17, 1928	13	9
Total			93	66

Average number of pigs farrowed per spring litter	13·29
Average number of pigs reared per spring litter	9·43
Percentage of pigs reared per spring litter	70·97

COST OF REARING LITTERS

Statement of Feed Fed to Sows from Breeding Date to Date of Farrowing

Roots (mangels), 592 pounds at $2.70 per ton	$ 0 80
Bran, 138 pounds at $34.50 per ton	2 38
Crushed oats, 173 pounds at $42 per ton	3 63
Middlings, 78 pounds at $48 per ton	1 87
Shorts, 98 pounds at $38 per ton	1 86
Brewers' grains, 20 pounds at $44.30 per ton	0 44
Oil meal, 20 pounds at $56 per ton	0 56
Skim-milk, 2,775 pounds at $4 per ton	5 55
Total	$17 09

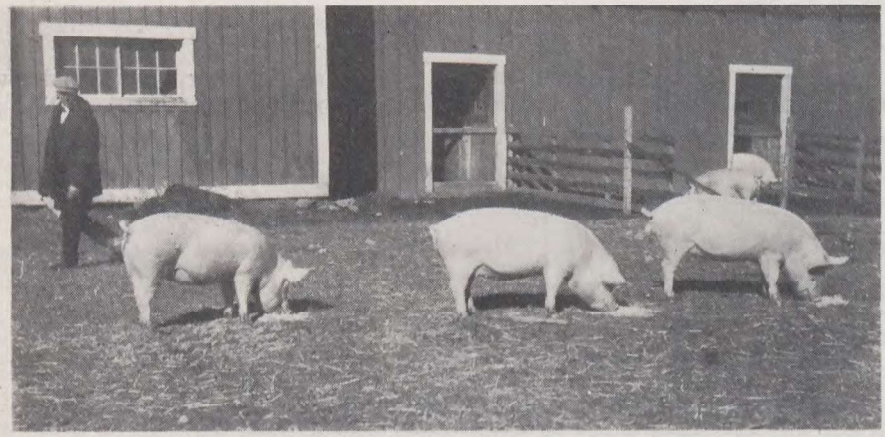
Statement of Feed from Birth to Weaning

Skim-milk, 1,657 pounds at $4 per ton	$ 3 31
Crushed oats, 72 pounds at $42 per ton	1 51
Bran, 72 pounds at $34.50 per ton	1 24
Middlings, 72 pounds at $48 per ton	1 72
Shorts, 72 pounds at $38 per ton	1 37
Roots (mangels), 203 pounds at $2.70 per ton	0 27
Total	9 42

Statement of Costs

Boar service	$ 2 00
Feed to birth	17 09
Feed, birth to weaning	9 42
Total cost to weaning	$28 51
Average cost per pig to weaning (9·4 pigs per litter)	3 03

The females in the Station breeding herd belong with one exception to the Augustine family. The following diagram indicates the descent of the principal members of the herd. Various families and strains have been tested and finally eliminated due to one defect or another. In selection of breeding stock emphasis has always been placed on prolificacy, docility and milking ability. In selecting for type, average length, great depth and strong bone have been deciding factors.

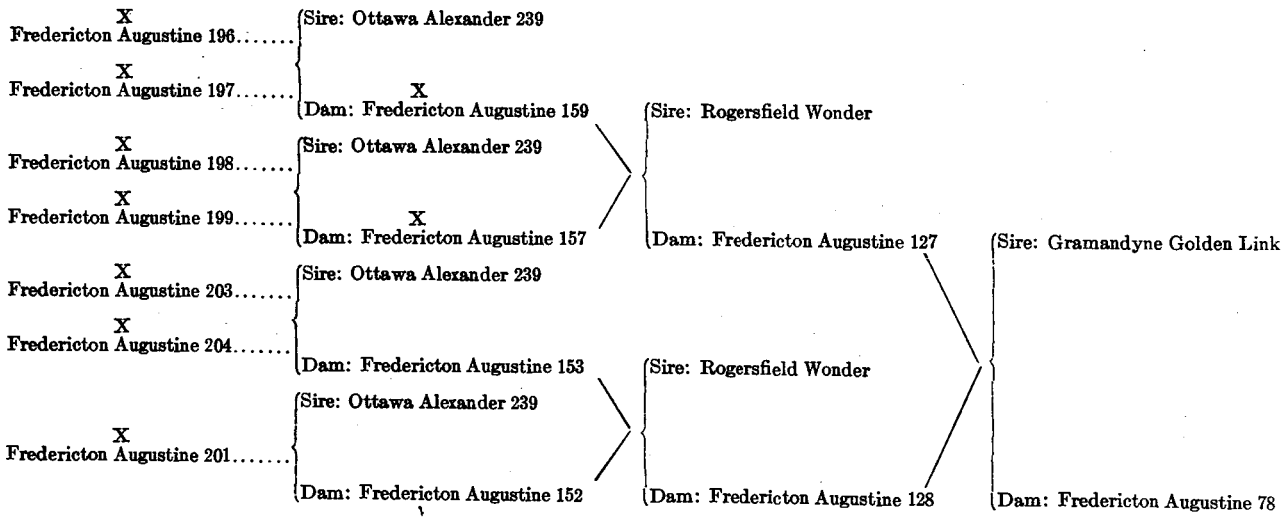


Pure-bred Yorkshire gilts, members of the Augustine family. This is a strong boned, deep middled strain, the result of selection based on economy of production, prolificacy, docility and matronly qualities essential in brood sows.

The Augustine females have been particularly prepotent. This has been observed for four generations. When new males have been introduced into the herd, the blood of the Augustine females has dominated, the general characteristics of the Augustine family predominating in the offspring. Fortunately good sires have been available to use on the females and very few undesirable traits have been introduced, indeed the imported boar, Rogersfield Wonder, grandsire of this season's crop of young sows, added strength of bone to the family.

DIAGRAM SHOWING EXTENDED PEDIGREE OF THE AUGUSTINE FAMILY AND MEMBERS OF THE FAMILY IN THE HERD AT THE PRESENT TIME

X Indicates breeding sows in the herd.

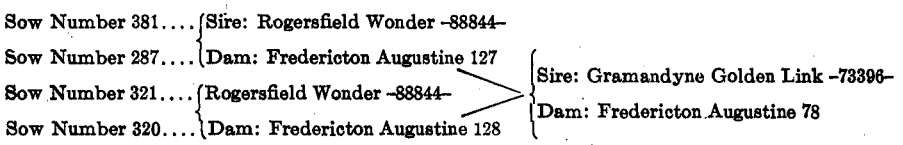


ADVANCED REGISTRATION OF SWINE

This year preliminary work was undertaken with the view of assembling data and perfecting a workable system for the advanced registration of swine. This work was carried on in co-operation with the Dominion Live Stock Branch.

The progeny of four sows numbering thirty-nine pigs were fed as individual groups on a uniform ration. In the final analysis, i.e., when hogs were slaughtered the value of the individual dam as a producer could be determined by such factors as early maturity, uniformity of litter, cost of gains, carcass grading and value of dam as a producer of bacon type pigs.

All of the litters were sired by Ottawa Alexander 239 —120064— The relationship of the four sows is portrayed in the following pedigree:—



To all intents and purposes the progeny of the first two sows were similar in general characteristics and they required the same feeding period, viz., 141 days. Further they required about the same amount of meal per 100 pounds grain. In the carcass grading including dressing percentage, per cent of export bacon, length of side, depth of fat, etc., these two litters bore a remarkable resemblance to one another.

Similarly the progeny of the second pair of sows were alike in general characteristics and in the carcass grading the resemblance was as marked as was the case with the progeny of the first pair of sows.

Analyzing the progeny test from a breeding standpoint it is quite evident that the four litters of pigs naturally fall into two groups. The progeny of the two sister sows numbers 381 and 287 being very similar to one another but as a group differing very much from the likewise similar progeny of the two sister sows numbers 321 and 320.

Thus the variation in reproductive ability can be plainly seen even between closely related stock. However, it is also apparent that certain strains of pigs produce more desirable litters; that is, litters which are large in number, easily and cheaply grown and which result in carcasses which are nearer to the ideal for the bacon trade. Such a strain can generally be traced back to one or two outstanding individuals. The aim and objects of the Advanced Registry Policy are briefly to give due credit to these better strains of pigs so that improvement may take place in our swine industry.

FIELD HUSBANDRY

The work in this Division included production costs with hay, grain, roots and silage crops, rotation experiments with three-, four-, five-, and six-year rotations; different treatments as to manure and fertilizer; cultural experiments with corn in hills and in drills; rates of seeding Victory and Marquis wheat and dates of seeding Victory oats.

The fall was open and the winter mild. The frost, however, went deeper in the ground than usual. This was probably due to the ground being either partly bare or covered with a thin layer of ice nearly all winter. Practically all the clover and considerable of the grasses in both the hay and pasture land winter-killed. April was cold and backward. Although only 55 inches of rain

fell during the first twenty-three days of May the land dried slowly as all the frost was not out of the land until the middle of May. The first dates of seeding were, wheat May 15, oats May 18, barley May 15, potatoes May 10, sunflowers June 6 and corn June 5.

Generally speaking seed sown during the first 23 days of May germinated well while that sown the last week of May and the first week of June germinated poorly. Growing conditions were good in June and early July. In thirty-seven days beginning July 22, rain was recorded on nineteen days with a total precipitation of 9·49 inches. During this period all crops suffered from excessive moisture. Hay could not be properly cured, grain lodged badly, corn was practically at a standstill, while all hoed crops suffered from lack of proper cultivation. The wet weather in September and October made it difficult to harvest grain and caused shelling and sprouting.

A six-year rotation consisting of first year, hoed crop; second year, grain; third year, clover hay; fourth year, mixed hay; fifth year, mixed hay; and sixth year, grain; has been carried on the past two seasons. It is proving more satisfactory than the four-year rotation of hoed crop, grain, hay and hay, which had been carried on previously. It provides more oats and straw and the labour costs are less as there is not so much land in hoed crop.

CROP PRODUCTION COSTS

All materials and operations in the crop production tables are charged at the 1928 prices, which are:—

Rent and taxes	$ 3 00 per acre
Machinery	2 85 per acre
Manure	2 00 per ton
Nitrate of soda	57 80 per ton
Sulphate of ammonia	57 80 per ton
Superphosphate	17 00 per ton
Muriate of potash	41 00 per ton
Mixing fertilizer	2 00 per ton
Timothy	10 00 per cwt.
Red clover	34 00 per cwt.
Alsike clover	25 00 per cwt.
Alfalfa	22 00 per bushel
Oats	1 50 per bushel
Swedes	0 80 per pound
Twine, $1.40 per ball of 8 pounds	1 75 per pound
Manual labour, teamster and tractor operator	0 25 per hour
Horse labour	0 10 per hour
Threshing oats	0 08 per bushel

In the six-year rotation the land is given an application of manure and fertilizer for the hoed crop the first year of the rotation and a light application of manure (usually 8 tons per acre) is applied in the fall on the second year hay stubble for the third year hay crop.

The cost of manure and fertilizer is distributed to the various crops in the rotation on the following basis:—

—	Manure	Mixed fertilizer
	per cent	per cent
1st crop	40	55
2nd crop	25	30
3rd crop	20	10
4th crop	10	5
5th crop	5	

COST OF PRODUCING HAY IN A SIX-YEAR ROTATION

Hay making was begun on July 5 and finished on August 17. The crop this year was 191 tons, 825 pounds.

Costs were kept on a 13·5-acre field of first-year hay, on an 11-acre field of second-year hay, and on a 10·85-acre field of third-year hay.

Table 9 shows the cost of producing first, second, and third-year hay for 1928, and the average cost of producing first and second-year hay for 1927 and 1928 in a six-year rotation. (The six-year rotation was started in 1927, therefore, there was no third-year hay in that year.) In this table one-third of the cost of the hay seed is charged to each hay crop in the rotation. The hay seed mixture used contained 10 pounds timothy, 8 pounds red clover, 4 pounds alsike and 4 pounds alfalfa. While the hay is charged with all the seed in the mixture, there was practically no alfalfa and only a small percentage of red and alsike clovers in any of the hay fields.

TABLE 9—COST PER ACRE OF PRODUCING HAY IN A SIX-YEAR ROTATION

Item		1st year hay		2nd year hay		3rd year hay
		1928	Average 1927 and 1928	1928	Average 1927 and 1928	1929
Rent and taxes	$	3·00	3·00	3·00	3·00	3·00
Manure	$	8·00	7·00	3·00	3·00	7·90
Fertilizer	$	0·86	1·005	0·57	0·645	.....
Seed	$	1·81	1·81	1·81	1·81	1·81
Machinery	$	2·85	2·85	2·85	2·85	2·85
Manual labour	$	2·77	3·575	3·52	3·425	3·24
Horse labour	$	0·91	0·935	0·90	0·895	1·19
Statement of Yield and Cost						
Total cost per acre	$	20·20	20·175	15·65	15·625	19·99
Yield per acre hay	tons	1·90	1·96	2·24	2·215	2·76
*Yield per acre dry matter	tons	1·52	1·57	1·79	1·77	2·21
†Average digestibility	per cent	55·0	55·0	55·0	55·0	55·0
Total yield per acre digestible nutrient	tons	0·84	0·86	0·98	0·97	1·22
Cost per ton hay	$	10·63	10·29	6·99	7·05	7·24
Cost per ton dry matter	$	13·29	12·85	8·74	8·83	9·05
Cost per ton digestible nutrient	$	24·05	23·46	15·97	16·11	16·39

*Assuming that hay contains 80 per cent dry matter.
†Clover and timothy, Table 2, "Feeds and Feeding," Henry and Morrison, 1923 edition.

COST OF PRODUCING OATS IN A SIX-YEAR ROTATION

A twelve-acre field which was in a hoed crop the previous year and which was fertilized for that crop with 15 tons manure and 600 pounds 2-8-3 fertilizer per acre, was sown on May 18 and 21 with Victory oats at the rate of three bushels per acre. The oats germinated well but oats did not tiller and the stand was rather thin. The straw was of good length but lodged badly in some parts of the field. There was considerable loss from shelling. The oats were harvested from August 31 to September 5.

Table 10 shows the cost per acre of producing oats in 1927 and 1928, also, average cost of producing oats for these years.

TABLE 10—COST PER ACRE OF PRODUCING OATS

Item		Oats		
		1928	1927	1927 and 1928
Rent and taxes	$	3·00	3·00	3·00
Manure	$	7·50	10·00	8·75
Fertilizer	$	1·76	2·58	2·17
Seed	$	4·50	4·50	4·50
Machinery	$	2·85	2·85	2·85
Twine	$	0·44	0·44	0·44
Manual labour	$	5·97	5·46	5·715
Horse labour	$	3·66	3·39	3·525
Threshing	$	3·40	3·14	3·27
Statement of Yield and Cost				
Total cost per acre	$	33·08	35·36	34·22
Yield per acre grain	bush.	42·49	39·2	40·85
Yield per acre grain	ton	0·72	0·67	0·695
Yield per acre straw	ton	0·93	1·07	1·00
Value of straw at $4 per ton	$	3·72	4·28	4·00
Cost of grain per acre considering value of straw	$	29·36	31·08	30·22
*Dry matter	per cent	90·8	90·8	90·8
Yield grain per acre dry matter	ton	0·654	0·608	0·631
†Average digestibility of grain	per cent	70·0	70·0	70·0
Yield grain per acre digestible nutrient	ton	0·458	0·426	0·442
Cost per bushel grain	$	0·691	0·793	0·74
Cost per ton grain	$	40·78	46·39	43·48
Cost per ton dry matter in grain	$	44·89	51·12	47·89
Cost per ton digestible nutrient in grain	$	64·10	72·96	68·37

*Oats, table 1, "Feeds and Feeding," Henry and Morrison, 1923 edition.
†Oats, table 2, "Feeds and Feeding," Henry and Morrison, 1923 edition.

COST OF PRODUCING SUCCULENT FEED FROM DIFFERENT SOURCES

Corn, sunflowers, turnips and a mixture of oats and peas have been grown at the Station under similar conditions the last seven years. From 1922 to 1926, inclusive, they were grown in a four-year rotation (for results see pages 18-23, inclusive, of the 1927 report for this Station). In 1927 and again this year they were grown in a six-year rotation.

The land on which they were grown this year was a clay loam. In the spring of 1927, 400 pounds per acre of a 2-12-5 fertilizer was applied broadcast and harrowed into the soil. The field was then seeded to oats. In the fall of 1927, 15 tons manure per acre was applied broadcast and ploughed under. This spring the land was cultivated with the stiff-tooth cultivator and given an application of 400 pounds per acre of 2-12-5 fertilizer. This fertilizer was mixed with the soil by means of the disk, spring-tooth and smoothing harrows. The land was in excellent tilth when sown.

The varieties sown were, Longfellow corn, Mammoth Russian sunflowers, Victory oats, Canadian Beauty peas and Ditmar swedes.

The land became waterlogged during the wet weather from July 22 to August 31. The corn yielded 4·36 tons, the sunflowers 10·9 tons and the oats and peas 6·15 tons per acre. The swedes were at a standstill during this period but they made good growth during September and October and yielded 23·53 tons per acre. The swedes were sown on June 13 and harvested on October 22. The cost of production of swedes for 1927 and 1928 and the average cost for these two years is given in table 11.

TABLE 11.—COST PER ACRE OF PRODUCING SWEDES

Item		Swedes		
		1928	1927	Average 1927 and 1928
Rents and taxes	$	3·00	3·00	3·00
Manure	$	12·00	12·00	12·00
Fertilizer	$	4·34	3·24	3·79
Seed	$	2·00	1·60	1·80
Machinery	$	2·85	2·85	2·85
Manual labour	$	42·08	36·19	39·135
Horse labour	$	8·51	7·75	8·13
Statement of Yield and Cost				
Total cost per acre	$	74·78	66·63	70·71
Total yield per acre	ton	23·53	24·56	24·05
Dry matter	per cent	11·04	9·91	.....
Total yield per acre dry matter	ton	2·60	2·43	2·52
*Average digestibility	per cent	87·0	87·0	87·0
Total yield per acre digestible nutrient	ton	2·26	2·11	2·19
Cost per ton green weight	$	3·18	2·71	2·94
Cost per ton dry matter	$	28·76	27·42	28·06
Cost per ton digestible nutrient	$	33·09	31·58	32·29

*Rutabaga, Table 2, "Feeds and Feeding," Henry and Morrison, 1923 Edition.

CULTURAL TESTS

VICTORY OATS—RATES OF SEEDING

The rates of seeding Victory oat tests were located on sandy loam. A three-year rotation of hoed crop, grain and hay is followed on this field. The land was given an application of 15 tons manure and 800 pounds 4-8-6 fertilizer per acre for the hoed crop in 1924, and 1,000 pounds 4-8-6 fertilizer per acre for the hoed crop in 1927. The field was fall ploughed and the stiff-tooth cultivator, disk and smoothing harrow were used to prepare the seed bed in the spring. The plots were 1/100 acre each when border effect had been eliminated by discarding the two outside rows on each side and a foot off each end. Duplicate plots were sown with each rate of seeding on May 30 and harvested on September 9. The results are given in table 12.

TABLE 12—VICTORY OATS—RATES OF SEEDING

Rate of seeding	Yield per acre 1928				Average for 4 years			
	Straw		Grain		Straw		Grain	
bush.	tons	lb.	bush.	lb.	tons	lb.	bush.	lb.
2	2	400	32	12	1	955	43	2
2·5	2	138	38	21	1	942	45	9
3	2	150	35	10	1	1,008	46	20
3·5	1	1,425	41	31	1	1,247	50	16
4	2	..	38	8	1	1,149	47	16

VICTORY OATS—DATES OF SEEDING

Duplicate 1/100 acre plots were sown with Victory oats at the rate of three bushels per acre on the dates given in table 13. The plots were located in the same field and the land was given the same treatment as the land on which the "Victory Oats—Rates of Seeding" were sown. The results are given in table 13.

TABLE 13—VICTORY OATS—DATES OF SEEDING

Date of seeding	Number of days seeding to harvest	Yield of straw per acre	Yield of of grain per acre
		tons lb.	bush. lb.
May 30, 1928	102	2 150	35 10
June 9, 1928	111	2 775	33 3
June 19, 1928	104	1 1,188	28 11
Average for 4 years			
Early seeding	106	1 1,008	46 20
Medium early seeding	109	1 1,711	46 31
Late seeding	108	1 1,321	37 22

OTHER EXPERIMENTS

The rotation experiments, various cultural experiments, and other farm management experiments will be reported at a later date when more data accumulate.

HORTICULTURE

TREE FRUITS

The winter of 1927-28 was a moderate one and the orchard wintered in good condition. Most varieties were in full bloom by May 31 and June 1. This was a week earlier than the previous year. The crop in general was better than anticipated early in the season and colour and quality were good.

ORCHARD FERTILIZER TREATMENT

A change was made in the fertilizer formula this year. Trees not in fertilizer experiment were given an application of five pounds nitrate of soda, two pounds acid phosphate and one pound muriate of potash. This was applied on May 15 and 16.

SPRAYING

A block of Fameuse and McIntosh in the cultural orchard was used for a spraying experiment begun in 1926, in co-operation with the Entomological Branch, to determine the value of lime sulphur and a lime sulphur aluminium sulphate mixture. The balance of the orchard was sprayed in accordance with the New Brunswick spray calendar as noted under experiment with lime sulphur. The dates of application were as follows:—

1st application, May 11-15.
2nd application, May 21-22.
3rd application, June 9-13.
4th application, June 27-28.

EXPERIMENT WITH LIME SULPHUR

This experiment was begun in 1926 in co-operation with the Entomological Branch to determine the value of lime sulphur for apple orchards in campari-son with the regular New Brunswick spray calendar, and also to determine the value of aluminium sulphate when added to the lime sulphur mixture.

Two varieties of apples were used for this experiment, namely, Fameuse and McIntosh. The system of spraying was as follows:—

Plot 1.—Sprayed in accordance with New Brunswick spray calendar as follows:—

1st application—3-10-40 Bordeaux plus 1½ pound arsenate of lime.
2nd application.—Same as above.
3rd application—Wettable sulphur 10 pounds, arsenate of lead 2 pounds, water 40 gallons.
4th application—3-10-40 Bordeaux plus 1½ pound arsenate of lime.
5th application—3-10-40 Bordeaux mixture.

Plot 2.—Lime-sulphur 1-40 plus 1½ pound arsenate of lead.

Plot 3.—Lime-sulphur 1-40 plus 3½ pounds aluminium sulphate plus 1 pound arsenate of lime.

Plot 4.—Lime-sulphur 2-40 plus 7 pounds aluminium sulphate plus 1 pound arsenate of lime.

Plot 5.—Check (no treatment).

The lime-sulphur aluminium sulphate mixture was prepared as follows:—

The aluminium sulphate was dissolved in a pail of water and emptied into the spray tank. The tank was then nearly filled and the mixture agitated. The lime-sulphur was then added, the mixture agitated and the arsenate of lime added.

The dates of applying the different spray mixtures were as follows:—

1st application—May 11 when leaf buds showed green.
2nd application—May 21 when blossom buds showed pink.
3rd application—June 12 when blossom petals had fallen.
4th application—June 28 two weeks after 3rd spraying.
5th application—July 18 as deemed advisable.

No poisons were used in the fifth application. Weather conditions are noted below.

WEATHER CONDITIONS

1st application—Fine before, during and after spraying.
2nd application—Dark before, during and after spraying—no rain.
3rd application—Fine before, during and after spraying.
4th application—Fine before, during and after spraying.
5th application—Fine before, during and after spraying.

The results are shown in table 14.

TABLE 14—SPRAYING EXPERIMENT WITH LIME-SULPHUR

Plot Number	Variety	Treatment	Per cent scab					Per cent insect injury			
			Clean	Light scab	Heavy scab	Cracked by scab	Total scab	Bud moth	Green fruit worm	Codling moth	Total insect injury
			%	%	%	%	%	%	%	%	%
1	McIntosh	N.B. spray calendar	78·0	10·7	6·3	1·6	18·7	1·7	2·2	.....	4·0
2	"	Lime-sulphur 1-40 plus 1½ pounds arsenate lead	43·9	37·2	16·2	0·6	54·1	1·4	1·3	.....	2·8
3	"	Lime-sulphur 1-40 plus 3½ pounds aluminium sulphate plus 1 pound arsenate of lime	51·9	31·5	13·2	1·4	46·3	1·2	1·2	.....	2·4
4	"	Lime-sulphur 2-40 plus 7 pounds aluminium sulphate plus 1 pound arsenate of lime	57·6	26·4	13·5	1·0	41·1	0·5	1·6	.....	2·2
5	"	Unsprayed	0·0	7·7	63·9	28·3	99·9	2·3	6·7	.....	9·1
1	Fameuse	N.B. spray calendar	89·8	4·7	0·6	0·1	5·4	3·1	1·9	.....	5·1
2	"	Lime-sulphur 1-40 plus 1½ pounds arsenate lead	62·5	25·6	7·9	0·1	33·7	3·2	1·5	.....	4·7
3	"	Lime-sulphur 1-40 plus 3½ pounds aluminium sulphate plus 1 pound arsenate of lime	86·0	8·9	0·7	0·0	9·8	2·3	2·3	.....	4·7
4	"	Lime-sulphur 2-40 plus 7 pounds aluminium sulphate plus 1 pound arsenate of lime	91·8	4·2	0·1	0·0	4·4	2·0	1·7	.....	3·7
5	"	Unsprayed	5·0	25·2	66·8	1·6	93·7	3·9	2·6	0·1	6·7
1	Average of both varieties.	N.B. spray calendar	83·9	7·7	3·4	0·8	12·0	2·4	2·0	.....	4·5
2	" "	Lime-sulphur 1-40 plus 1½ pounds arsenate of lead	53·2	31·4	12·0	0·3	43·9	2·3	1·4	.....	3·7
3	" "	Lime-sulphur 1-40 plus 3½ pounds aluminium sulphate plus 1 pound arsenate of lime	68·9	20·2	6·9	0·7	28·0	1·7	1·7	.....	3·5
4	" "	Lime-sulphur 2-40 plus 7 pounds aluminium sulphate plus 1 pound. arsenate of lime	74·7	15·3	6·8	0·5	22·7	1·2	1·6	.....	2·9
5	" "	Unsprayed	2·5	16·4	65·3	14·9	96·8	3·1	4·6	0·05	7·9

NOTE.—The "McIntosh" check was located in only one section of the experiment.
The "Fameuse" check was located in only one section of the experiment.

NOTES ON FOLIAGE

Considerable leaf injury was noted in plots where lime-sulphur 1-40 and lime-sulphur 2-40 plus seven pounds aluminium sulphate were used. Where lime-sulphur was used the injury was especially severe after the second and third applications, while the lime-sulphur 2-40 plus seven pounds aluminium sulphate mixture gave severe injury after the first application. Where lime-sulphur was used the foliage was inferior to that of any of the other plots, the leaves being smaller and of a paler green colour. Where the lime-sulphur 1-40 and the aluminium sulphate mixture was used the foliage was exceedingly good. Foliage on Plot 4 was better than on Plots 1 and 2.

NOTES ON RESULTS

The results to date indicate that the ordinary lime-sulphur mixture is not a satisfactory spray for the New Brunswick apple orchards. The regular New Brunswick Spray Calendar gives a little better scab control than the lime-sulphur 1-40 aluminium sulphate, but the fruit is not as well finished as where lime-sulphur sprays are used. Lime-sulphur double strength with aluminium sulphate causes too much foliage injury. A calendar which recommended Bordeaux mixture before the blossoms open and lime-sulphur Bordeaux 1-40 with aluminium sulphate after the blossoms open theoretically should be a desirable spray calendar for the New Brunswick conditions. Aluminium sulphate, when mixed with lime-sulphur generates a very poisonous gas in the the spray tank, hence it must be used with care. This militates against a general recommendation as to its use.

GRASS MULCH VERSUS REMOVING HAY IN SOD ORCHARD

This experiment as begun in 1914 with McIntosh and Fameuse varieties. In one section of the orchard the grass is cut and left on the ground as a mulch; in the other section, the grass is cut and removed as hay. The results for the year, as well as the average results to date, are shown in table 15.

TABLE 15—GRASS MULCH VERSUS REMOVING HAY IN SOD ORCHARD

Variety	Treatment	Total number of trees in block	Total number of trees of bearing age	Total number of trees bearing	Number of trees of bearing age bearing	Average yield per tree bearing age	Average yield per bearing tree bearing age	Average annual yield per tree 1920-1928 inclusive
						pecks	pecks	pecks
Fameuse	Grass cut and left as mulch	17	16	16	16	28·51	28·51	10·06
Fameuse	Grass cut and removed as hay	27	24	24	24	22·53	22·53	8·18
McIntosh	Grass cut and left as mulch	15	14	14	14	25·28	25·28	9·16
McIntosh	Grass cut and removed as hay	16	15	15	15	17·55	17·55	6·31

NOTE.—The results indicate the advisability of cutting the grass and leaving it as mulch, rather than removing as hay crop.

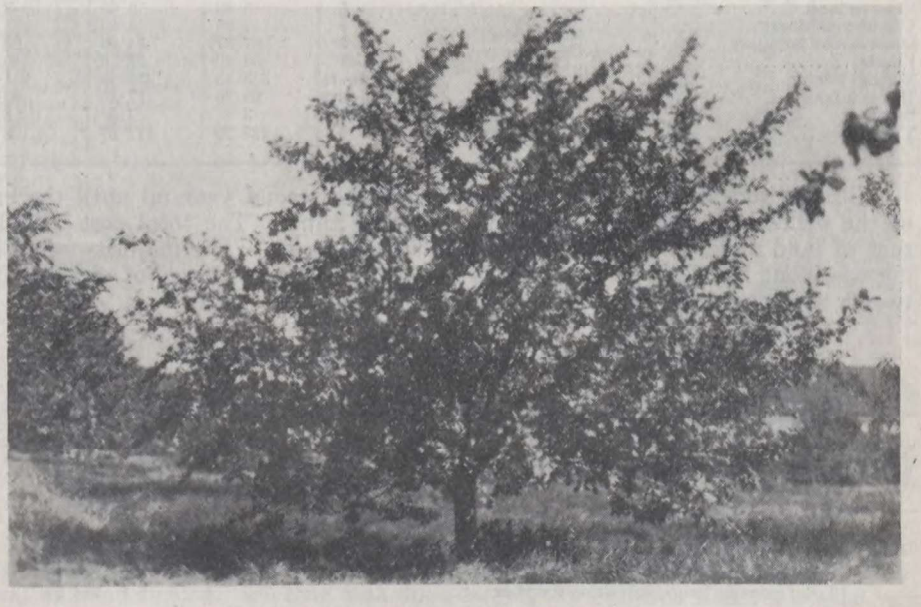
VARIETY ORCHARD

This orchard was continued in sod during the year. The Melba variety bore well and the quality and colour of the fruit were good. Fruit was ready for use on September 4. This variety can be generally recommended as an early apple.

The Lobo variety produced a good crop of well coloured fruit, but suffered somewhat from a light scab infection. The fruit was of good quality and extended in season from October 5 to December 5. This is a good variety, but since its season so closely approximates Fameuse and McIntosh, its commercial value is questionable unless it can be used as a pollinator for McIntosh, and at this Station it is a day or two later in blooming.

The Sandow variety produced a light crop and one of the trees went back in general condition. The fruit was fairly well coloured and of good quality. This is a winter variety of promise. A considerable number of scions were distributed during the year so that a more general test might be made with this variety.

The above three varieties are the most promising to date. Other good new varieties are Joyce—a McIntosh seedling that follows Melba in season. The tree is hardy and a good grower. The fruit is well coloured and of good quality, but a little large for dessert purposes. Bingo, Niobe, Emilia and Elmer are Northern Spy seedlings of merit, but not sufficiently good for commercial purposes. Bingo is an apple of good size and colour but it lacks in crispness and flavour. The latter three lack colour and appearance.



Melba apples, a seedling of the McIntosh Red. This is an early apple of exceptionally good quality.

SMALL FRUITS

STRAWBERRIES—COST OF PRODUCTION FOR CANNING PURPOSES

One-half acre of strawberries was planted in 1927 and one-third acre in 1928, in order to obtain information on the cost of producing this crop. The 1927 crop was grown on land that had received thirty tons of barnyard manure per acre. The 1928 crop was grown on land that received fifteen tons of barnyard manure, 150 pounds nitrate of soda, 750 pounds acid phospate and 300

pounds muriate of potash per acre. Barnyard manure was applied the autumn previous to planting. Nitrate of soda, at the rate of 250 pounds per acre, was applied to each plantation during the last week in August. This practice has been found to promote fruit bud formation.

In 1927, planting was done by setting plants against the edge of a furrow opened with a plough. Plants were set one foot apart. In 1928, plants were set one and one-half feet apart by two men working with a spade. This latter method of planting was found to be more economical.

Plants cost $5 per thousand in 1927 and $4 per thousand in 1928. Man labour was charged at twenty-five cents per hour and horse labour at ten cents per hour.

The factors in establishing an acre plantation during the first season were as follows:—

STRAWBERRIES—FACTORS IN COST OF ESTABLISHING A PLANTATION DURING FIRST SEASON

—		1927	1928	Average
Rent of land	$	3 00	3 00	3 00
Use of machinery	$	2 85	2 85	2 85
Manure and fertilizer	$	67 87	54 08	60 97
Plants	$	54 40	27 26	40 83
Manual labour	hours	313·15	256·65	284·90
Horse labour	hours	68·86	57·26	63·06
Straw	tons	3·5	3·5	3·5
Total cost	$	227 29	171 07	199 18

The factors in cost of production during the second year up until the end of the picking season, were as in the following table. The total cost includes rent of land and use of machinery as previously noted. The majority of picking was done by children at ten cents per hour. Man in charge of pickers cost twenty-five cents per hour.

FACTORS IN COST OF PRODUCTION DURING SECOND YEAR—1928

Manual labour	hours	316·9
Picking 48 boxes at 2 cents per box	$	0 96
1,630 boxes at 75 cents per 100	$	12 23
Total Cost	$	71 08
Cost of establishing plantation in 1927	$	227 29
Total cost of plantation from planting 1927 to end of picking season 1928	$	298 37
The crop during 1928 was very light on account of winter injury.		
The yield was 1,629·5 quarts per acre.		
The return for berries at 14·04 cents per quart was	$	228 78
The net return for plants sold was	$	19 76
Total revenue from plantation for year	$	248 54

Records were also kept of the cost of renovating a one year old strawberry plantation. The data include preparation for winter, as well as renovating. Two hundred and fifty pounds of nitrate of soda were applied during the last week in August to promote fruit bud formation. This was charged at cost. Labour was charged as previously noted. The results were as follows:—

STRAWBERRIES—COST OF RENOVATING YEAR OLD PLANTATION AND PREPARING SAME FOR WINTER

		1928
Fertilizer	$	7 22
Manual labour, including mulching for winter	hours	308·98
Horse labour, including mulching for winter	hours	72·59
Straw	tons	3·5
Total cost	$	97 91

VEGETABLES

BEANS—COST OF PRODUCTION FOR CANNING PURPOSES

Records have been kept for two years to determine the cost of growing beans for canning purposes. Three varieties were grown in 1927, viz., Masterpiece(an early green podded variety), Refugee (a late green podded variety) and Hodson Wax (a late yellow podded variety). In 1928 only one variety was grown, viz., Masterpiece. Seed has been sown at approximately 60 pounds per acre with a grain drill in rows twenty-eight inches wide. Good vigorous crops, free from disease, have been obtained. On account of the labour involved and weather conditions, picking has been retarded and part of the crop became too old for canning purposes.

The results are shown in table 16.

TABLE 16.—BEANS—COST OF PRODUCTION FOR CANNING PURPOSES

—		1927	1928	Average
Rent of land	$	3 00	3 00	3 00
Use of machinery	$	2 85	2 85	2 85
Fall ploughing	man hours	10	.....	5
Fall ploughing	horse hours	20	.....	10
Spring ploughing	man hours	5	9	7
Spring ploughing	horse hours	15	18	16·5
Manure 50% of 15 tons	$	15 00	15 00	15 00
Fertilizer 55% of cost	$	3 94	7 94	5 92
Applying fertilizer	man hours	3·16	2·00	2·58
Harrowing	man hours	3·75	3·00	3·37
Harrowing	horse hours	7·5	6·0	6·75
Seed	$	5 73	5 00	5 36
Seeding	man hours	1·6	2·0	1·8
Seeding	horse hours	3·2	4·0	3·6
Applying poison bran	man hours	0·25	.....	0·12
Poison bran	lb.	17·5	.....	8·75
Cultivating	man hours	7·16	10·0	8·58
Cultivating	horse hours	7·16	8·0	7·58
Hoeing	man hours	101·75	57·0	79·39
Picking	man hours	532·91	384	458·46
Total cost	$	163 20	105 01	134 10
Yield per acre	lb.	6,058	6,320	6,189
Price per pound	cts.	2·0	2·25	.....
Value of crop	$	121 16	142 20	131 68
Loss per acre	$	42 04	.....	2 42
Profit per acre	$	.....	37 19	.....
Cost per pound	cts.	2·69	1·66	2·16
Total hours of labour	man and boy hours	665·58	467	566·29
Total hours of labour	horse hours	52·86	36	44·43

NOTE.—The records show a considerable variation in the amount of labour required for the two seasons. The 1927 field was weedy and required a great deal of hand hoeing. Picking was done largely by children and their efficiency was very variable. Labour charges have varied from eight to twenty-five cents per hour.

In 1928 a fair profit was shown and a considerable portion of the crop was not harvested. This would indicate that under favourable soil conditions, with an abundance of cheap labour and close proximity to a canning factory, beans can be profitably grown for canning purposes.

TOMATOES—GROWING IN GREENHOUSE

Bonny Best tomatoes were sown in the greenhouse the last of January. The first ripe tomatoes were obtained on June 18 and the last on August 20. The yield of ripe fruit per plant averaged 5·84 pounds.

CUCUMBERS—GROWING IN GREENHOUSE

Cucumbers were sown in the greenhouse on July 13. The first crop was obtained November 16, and the last on January 3. The yield averaged 4·77 cucumbers per vine.

POTATOES—CULTIVATION EXPERIMENT

Experiments have been carried on for six years to determine the relative merits of one, two, three and four cultivations for the potato crop. Each cultivation includes one trip with the cultivator and one with the horse hoe. The results for the year, as well as for the previous years, are shown in table 17.

TABLE 17—POTATOES—CULTIVATION EXPERIMENT

Number of cultivations	Plot	Yield per acre			Average yield for 6 years	
		Merchantable	Small	Total	Merchantable	Total
		lb.	lb.	lb.	lb.	lb.
Cultivated once	4	17,002	2,335	19,337		
Cultivated once	8	14,973	2,986	17,959		
Average		15,987·5	2,660·5	18,648	18,827·7	21,054·7
Cultivated twice	3	18,457	2,508	20,965		
Cultivated twice	7	16,217	1,895	18,112		
Average		17,337	2,201·5	19,538·5	19,026·1	21,233·6
Cultivated three times	2	19,606	2,221	21,827		
Cultivated three times	6	16,045	2,240	18,285		
Average		17,825·5	2,230·5	20,056	19,329·3	21·365·9
Cultivated four times	1	16,964	1,780	18,744		
Cultivated four times	5	16,447	2,489	18,936		
Average		16,705·5	2,134·5	18,840	17,958·1	20,043·7

The results for the year, as well as the average results for six years, were in favour of three cultivations.

Potatoes at this Station are grown in a three-year rotation. Planting is usually done about June 5 and the seed bed well prepared, hence the ground is relatively free from weeds and where weeds are not a problem, three cultivations would appear to be ample. Where potatoes are planted early in the season and under certain seasonal conditions, further cultivation might be advantageous.

POTATOES—WIDTH OF ROW EXPERIMENT

This experiment has been carried on for several years to determine relative merits of two, two and one-half, three, and three and one-half foot rows for potato culture. Seed has been planted uniformly a foot apart in the row. During the present year, the planting was done with the planter and a series of plots was included with rows three and one-half feet wide, planted close. The results for the year, as well as the average results of a five-year period, are shown in table 18.

TABLE 18.—POTATOES—WIDTH OF ROW EXPERIMENT

Width of row	Yield per acre			Average yield per acre for 5 year period	
	Merchantable	Small	Total	Merchantable	Total
	lb.	lb.	lb.	lb.	lb.
2 feet apart	16,160	2,680	18,840	22,298·1	25,157·5
2½ feet apart	21,827	2,067	23,894	20,625·0	22,773·2
3 feet apart	21,981	1,914	23,895	19,479·2	21,231·6
3½ feet apart	17,883	2,795	20,678	18,058·0	19,844·1
3½ feet apart planted close	22,670	2,795	25,465		

The results for the year were in favour of the 3½ foot row planted close. Where the sets were equally spaced in the rows, 2½ and 3 foot rows gave similar yields.

A comparison of the results for five years, from rows of different widths with sets equally spaced, indicates the highest yield from rows two feet wide, followed by rows 2½ feet wide. A two-foot row cannot be conveniently worked, hence the 2½-foot row is to be recommended. The results this year from the 3½-foot row closely planted suggest a modification of the usual practice.

CEREALS

The yields of the different cereals this season were more affected by the date of sowing than by any other single factor. Only 0.55 inches of rain fell the first twenty-three days of May and grain sown in that period germinated well. The last week of May and the first week of June were wet and nearly all grain sown in that period germinated poorly and did not tiller. From July 23 to August 31 inclusive, 9.49 inches of rain fell. This excessive moisture caused a large percentage of the grain to lodge and caused considerable loss from shelling and sprouting.

The work in this Division includes variety tests of wheat, oats, barley, beans, peas and buckwheat; tests of various mixtures of wheat, oats and barley; and of oats and barley; and tests of selections of wheat, barley, oats and buckwheat.

VARIETY TESTS

Two types of plots are used for testing varieties or strains of cereals, viz., rod-row and field plots. Rod-row plots are 18½ feet when sown but at harvest time or shortly before, one foot is taken off each end making the plots one rod long. Three or five rows are seeded but only the centre row in the three row plots and the three centre rows in the five row plots are harvested. Field plots are used to obtain additional information on important varieties. They are usually 1/100 acre each when border effect has been eliminated by discarding two outside rows on each side and a foot off each end.

VARIETY TESTS—WHEAT, OATS AND BARLEY IN FIELD PLOTS

The land on which the field plots of wheat, oats and barley were located is a sandy loam. A three-year rotation of hoed crop, grain and hay is followed on this field. The land was given an application of 15 tons manure and 800 pounds 4-8-6 fertilizer per acre for the hoed crop in 1924, and of 1,000 pounds 4-8-6 per acre for the hoed crop in 1927.

Five varieties of wheat, six varieties of oats and five varieties of barley were sown in quadruplicate plots and one variety of barley was sown in duplicate plots on May 30.

WHEAT.—Garnet Ottawa 652; Huron Ottawa 3; White Russian and Early Red Fife, Ottawa 16; gave the largest yield this year in the order named. White Russian and Huron, Ottawa 3, have given the largest yield in the order named, of the varieties which have been tested the last eight years.

OATS.—Banner, Ottawa 49; Victory; Laurel, Ottawa 477 and Gold Rain gave the largest yield this year in the order named. Victory, Banner Ottawa 49 and Gold Rain have given the largest average yield of the varieties tested the last five years.

BARLEY.—O. A. C. No. 21; Star; Charlottetown No. 80 and Chinese Ottawa 60, gave the largest yield this year in the order named. Charlottetown No. 80; O. A. C. No. 21 and Chinese Ottawa 60 have given the largest yield of the varieties tested the last five years.

GRAIN MIXTURES

The grain mixtures shown in tables 19 and 20 were sown on May 30 in duplicate 1/100 acre plots. The grains used in the mixtures were Huron wheat, Victory oats, and Charlottetown No. 80 barley. The yields for 1925, 1926, 1927 and 1928 are given in tables 19 and 20.

TABLE 19.—BARLEY, WHEAT AND OATS, SOWN IN COMBINATION

Mixture per acre, bushels	Number of days maturing 1928	Yield of grain per acre 1928	Yield of grain per acre 1927	Yield of grain per acre 1926	Yield of grain per acre 1925	Average yield for last 4 years 1925-28
		lb.	lb.	lb.	lb.	lb.
Wheat 1, oats 1, barley 1	102	1,100	1,112	1,563	2,250	1,506
Wheat ½, oats 1, barley 1	102	1,050	975	1,825	2,550	1,600
Wheat ½, oats 2, barley 1	102	1,250	850	2,088	2,383	1,643
Huron wheat 1½	108	505	128	800	1,400	708
Victory oats 3	102	1,200	1,238	1,516	2,637	1,648
Charlottetown No. 80 barley 2½	98	581	946·2	1,488	2,250	1,316

TABLE 20.—BARLEY AND OATS, SOWN IN COMBINATION

Mixture per acre, bushels	Number of days maturing 1928	Yield of grain per acre 1928	Yield of grain per acre 1927	Yield of grain per acre 1926	Yield of grain per acre 1925	Average yield for last 4 years 1925-28
		lb.	lb.	lb.	lb.	lb.
Oats 1, barley 1	102	925	1,013	1,694	2,250	1,471
Oats 1½, barley 1½	102	925	1,075	2,069	2,266	1,584
Oats 2, barley 1	102	950	1,388	2,301	2,416	1,764
Victory oats 3	102	1,200	1,238	1,516	2,637	1,648
Charlottetown No. 80 barley 2½	98	581	946	1,488	2,250	1,316

PEAS—VARIETY TEST IN ROD-ROW PLOTS

Five varieties of field peas were sown on May 21 in quadruplicate rod-row plots. The peas were harvested on September 2. They were still blooming but the lower parts of the vines were dead and the peas were shelling so badly that leaving them longer would have decreased yields. Chancellor yields were decreased more than any other variety by shelling.

Canadian Beauty, Arthur Ottawa 18, Chancellor Ottawa 26, Prussian Blue, Mackay Ottawa 25 yielded this year in the order named. In the last four years however, Canadian Beauty, Prussian Blue, Arthur Ottawa 18 and Chancellor Ottawa 26 gave the largest average yields in the order named.

BEANS

The land on which the beans were grown grew a crop of oats the previous year. After the oats were removed fifteen tons manure per acre were applied and ploughed under. This spring the land was again ploughed. It was then harrowed and ribbed up into 30-inch drills.

Seven varieties of beans were sown in quadruplicate plots on June 2. White Pea and Large White were so badly affected with anthracnose as to be unsaleable. Approximately fifty per cent of the Navy were also unsaleable. The other varieties were comparatively free from anthracnose. Soldier was especially free from anthracnose. This variety is early maturing and of good quality. White Marrowfat is the best quality but is rather late maturing for the district. Yellow Eye, while a good bean, was more affected by disease, was not a good quality, and was slightly later maturing than Soldier. Norwegian while a good yielder and comparatively free from disease is very poor quality. Results are given in table 21.

TABLE 21.—BEANS—VARIETY TESTS

Name of variety	Date of ripening	Number of days maturing	Average length of straw	Average length of pod	Yield per acre	Weight per measured bushel after cleaning	Average yield for 7 years 1922-1928
			in.	in.	bush. lb.	lb.	bush. lb.
Navy Ottawa 711	Sept. 22 and Oct. 2	114·5	15·0	4·0	34 44	63	31 35
White Marrowfat	Oct. 2	122·0	12·5	3·7	33 53	65	28 10
Norwegian, Ottawa 710	Sept. 19	109·0	13·5	5·0	26 58	62	28 3
Soldier	Sept. 19	109·0	11·8	5·6	22 21	63	23 54
Yellow Eye, Kentville	Sept. 19 and 22	109·8	12·8	3·9	20 34	65	22 55
White Pea	Oct. 2	122·0	15·3	3·8	14 6	64	24 18
Large White, Ottawa 713	Sept. 19	109·0	13·3	3·5	3 9	64	15 20

ROD-ROW VARIETY TEST OF CEREALS

Variety tests of wheat, barley and oats in rod-row plots have been carried on the last five years. The first three years all varieties under test were tested four times each year. The last two years six varieties of wheat and five of barley which did not appear to have any economic importance were allowed one plot only each year. All other varieties were allowed at least four plots each while varieties on which special information was wanted in the shortest possible time, were each tested eight times. Table 22 gives the relative yield of all the varieties which have been tested each of the last five years, 100 in each case represents the average yield of all the varieties under test.

TABLE 22.—ROD-ROW TEST OF CEREALS (WHEAT, OATS AND BARLEY)

Wheat		Oats		Barley	
Name	Relative yield	Name	Relative yield	Name	Relative yield
	per cent		per cent		per cent
Huron Cap Rouge	116·7	Banner Waugh	113·4	Early Chevalier, Ottawa 51	117·6
Whitehead's Charlottetown 123	114·4	Leader B, Ottawa Selected	112·9	Manchurian, Ottawa 50	116·4
Bishop, Ottawa 8	113·0	Banner, Sask. 99	111·8	Chinese, Ottawa 60	116·0
Huron, Ottawa 3	109·3	Banner, McClone	109·8	O. A. C. No. 21	115·4
White Russian, Ottawa Selected	107·2	Banner Dow	109·1	Mensury MacDonald 3207	115·1
Garnet, Ottawa 652	106·7	Danish Island Swedish	109·0	Mandscherni MacDonald 1807	114·0
Early Russian, Ottawa 40	105·8	Banner, MacDonald 4407	108·0	Manchurian Cap Rouge	113·3
Major, Ottawa 522	104·1	Lincoln	107·9	Manscherni MacDonald 809	109·6
Early Red Fife, Ottawa 16	97·5	Victory, Swedish	107·6	Bearer, Ottawa 475	106·0
Reward, Ottawa 928	91·8	Banner, Sask. 144	107·5	Charlottetown No. 80	105·3
Master, Ottawa 520	90·7	Gold Rain, Swedish	107·4	Hannchen, Sask. 229	99·3
Red Fife, Ottawa 17	90·5	Banner, Langille	107·0	Feeder, Ottawa 561	97·5
Ruby, Ottawa 623	86·3	Banner, Cap Rouge	106·4	Gold, Swedish	93·9
Marquis, Ottawa 15	83·9	Irish Victor P, Ottawa Selected	104·9	French Chevalier	86·1
White Fife, Ottawa 11	82·9	Banner, University of B.C.	104·4	Duckbill MacDonald207	81·8
		O. A. C. No. 72	101·3	Himalayan, Ottawa 59	72·4
		Alaska	100·7	Duckbill, Ottawa 57	70·5
		Banner Dixon	100·0	Guymayle, MacDonald	69·9
		Banner, Ottawa 49	98·6		
		Columbian, Ottawa 78	97·4		
		Banner, Griffin	97·3		
		Mansholts III	97·0		
		Legacy, Ottawa 678	95·1		
		Prolific, Ottawa 77	91·3		
		Leader A, Ottawa Selected	84·7		
		O. A. C. No. 3	84·1		
		Laurel, Ottawa 477	63·0		
		Liberty, Ottawa 480	62·2		

There are also a number of varieties which have been grown in rod-row plots less than five years which have given excellent yields the years they have been grown. These include Aurore and 929 B wheat; Star, Velvet, Glabron and Trebi barley; Longfellow Ottawa 478, Star and White Cross oats.

BUCKWHEAT—VARIETY TEST IN ROD-ROW

Twenty-four varieties or strains of buckwheat were sown in duplicate rod-row plots of three rows each on June 14. This year Grey buckwheat gave the largest yield, but various selections of Tartarian and Rye have given the highest average yields for the years grown.

REGISTERED SEED GRAIN

In 1926, 400 heads of Victory oats were selected from a field of registered Victory oats. The seed from each head was sown in a head row on May 7, 1927. At harvest all but fifteen rows were discarded. The seed from each of these fifteen head rows was sown in a separate rod-row plot on May 21, 1928. They were all harvested separately. The eleven which gave the lowest yield were bulked, the other four were kept separate. A composite sample from the eleven which were bulked and a sample from each of the four which were kept separate, were sent to the Canadian Seed Growers' Association for verification and they will be grown as elite stock seed in 1929.

CO-OPERATIVE TESTING OF SEED GRAIN

Variety tests of wheat and oats are being carried on at this Station and by a number of Illustration Station operators in co-operation with the New Brunswick Seed Board, the object being to determine the varieties best suited to each district.

FORAGE CROPS

The crops grown under this division were grown on either a sandy or a medium loam with good natural drainage. Therefore they were not affected by the cold wet weather during the last week of May and the first week of June which lowered the germination of crops sown on heavy clay land in that period. In addition, they were benefited by the heavy rains from July 23 to August 31 which had such a deleterious effect on crops grown on clay land or lands with poor drainage.

FIELD ROOTS

The field on which the variety tests of field roots were conducted was fall ploughed one-year old clover sod. In the spring 15 tons per acre of barnyard manure were ploughed under. The land was then disked and given a broadcast application of 800 pounds 2-8-3 home-mixed fertilizer per acre. The fertilizer was mixed with the soil by means of the spring-tooth and smoothing harrows, after which, the land was ribbed up into 30-inch drills. All varieties were tested four times in drills 80 feet long. In estimating yields only those portions of each plot which had a perfect stand were used. When the roots were harvested a composite sample of each plot of each variety was taken. These samples were air dried and forwarded to Ottawa for dry matter determination.

SWEDES AND TURNIPS—VARIETY TESTS

SWEDES.—Twenty-five varieties of swedes were sown on May 17. They were thinned to 10·5 inches on June 9. Three plots of each variety were pulled on October 16 and the remaining plot on October 19.

FALL TURNIPS.—Five varieties of fall turnips were sown on June 7 and thinned to 10·5 inches on June 28. They were pulled on September 7. Even at that date the tops of all the varieties had begun to dry up and a few roots of Yellow Tankard were rotten.

The yields of swedes and fall turnips are given in table 23.

TABLE 23.—SWEDES AND FALL TURNIPS—VARIETY TEST

Name of Variety	Source of Seed	Yield per acre			
		Green weight		Dry weight	
		tons	lb.	tons	lb.
Swedes—					
Bangholm Pajberg	Trifolium	40	612	4	1,528
Olsgaard Bangholm	Hjalmar, Hartman & Co., Copenhagen	44	440	4	739
Kangaroo	Wm. Ewing Co	40	359	4	581
Shepherd Swede	Trifolium	42	547	4	421
Bangholm Klark M	Trifolium	36	603	4	213
Irish King	Wm. Rennie Seed Co	41	1,579	4	168
Bangholm	General Swedish Seed Co., Svalof	41	564	4	87
Ditmar	H. H. McNutt	42	853	3	1,993
New Century	Wm. Rennie Seed Co	37	220	3	1,860
Kangaroo	Wm. Rennie Seed Co	36	485	3	1,741
Magnum Bonum	Wm. Rennie Seed Co	37	42	3	1,511
Bangholm	Wm. Ewing Co	34	968	3	1,493
Bangholm Studsgaard	Trifolium	31	845	3	1,457
Corning	Yarmouth Fruit Producers	36	1,433	3	1,454
Invicta Bronze Top	Wm. Rennie Seed Co	39	372	3	1,394
Best of All	Wm. Rennie Seed Co	34	217	3	1,363
Improved Yellow Swedish	General Swedish Seed Co., Svalof	35	1,827	3	1,339
Garton's Superlative	Wm. Ewing Co	39	1,444	3	1,320
Canadian Gem	Wm. Rennie Seed Co	33	1,570	3	1,275
Magnum Bonum	Wm. Ewing Co	36	700	3	1,240
Best of All	Wm. Ewing Co	36	1,840	3	1,179
Bangholm	Kentville Experimental Station	30	211	3	910
Bangholm	Nappan Experimental Station	29	717	3	896
Hartley's Bronze Top	Wm. Rennie Seed Co	38	692	3	546
Purple Top	Central Experimental Farm	30	1,195	3	270
Fall Turnips					
Fynsk Bortfelder	Danske Landboforeningers Froforsyning	20	441	1	982
Dales	Danske Landoforeningers Froforsyning	18	1,612	1	894
Fynsk Bortfelder	Hjalmar, Hartman & Co., Copenhager	19	880	1	531
Bortfelder	Hjalmar, Hartman & Co., Copenhagen	20	1,669	1	423
Yellow Tankard	Danske Landboforeningers Froforsyning	19	529	1	208

MANGELS AND SUGAR BEETS—VARIETY TEST

MANGELS.—Twenty-nine varieties of mangels were sown on May 17 and were thinned to 11 inches on June 11. Plots 1 and 2 of each variety were pulled on October 4 and plots 3 and 4 on October 5.

SUGAR BEETS.—Three varieties of sugar beets were sown on May 17. They were thinned to 10·5 inches on June 9 and were pulled on October 1.

The yields of mangels and sugar beets are given in table 24.

TABLE 24.—MANGELS AND SUGAR BEETS—VARIETY TEST

Name of variety	Source of Seed	Yield per acre			
		Green weight		Dry weight	
		tons	lb.	tons	lb.
Mangels					
Green Top Half Sugar	Hjalmar, Hartman & Co., Copenhagen	36	150	4	65
Leviathan Half Rose	Wm. Rennie Seed Co	42	1,317	3	1,872
Giant White Half Sugar	Wm. Ewing Co	32	1,533	3	1,748
Yellow Intermediate	Central Experimental Farm	33	191	3	1,424
Danish Sludstrup	Wm. Ewing Co	37	1,202	3	1,307
Giant Yellow Intermediate	Wm. Ewing Co	36	439	3	1,269
Stryno Barres	Hjalmar, Hartman & Co., Copenhagen	37	405	3	1,143
Red Top Half Sugar	Hjalmar, Hartman & Co., Copenhagen	31	678	3	1,093
Yellow Eckendorfer	General Swedish Seed Co., Svalof	38	1,029	3	993
Sludtsrup Barres	Hjalmar, Hartman & Co., Copenhagen	37	1,495	3	969
Long Red Mammoth	Wm. Ewing Co	32	1,721	3	942
Rosted Barres	Hjalmar, Hartman & Co., Copenhagen	35	317	3	937
Barres Half Long	General Swedish Seed Co	33	1,883	3	908
Danish Sludstrup	Kenneth MacDonald & Sons	34	668	3	789
Improved Giant	Wm. Rennie Seed Co	29	460	3	743
Elvetham Mammoth	Hjalmar, Hartman & Co., Copenhagen	33	1,543	3	720
Barres Sludstrup	General Swedish Seed Co., Svalof	33	212	3	664
Perfection Mammoth Long Red	Wm. Rennie Seed Co	31	28	3	622
Eckendorfer Yellow	Hjalmar, Hartman & Co., Copenhagen	39	1,434	3	467
Ideal	Wm. Rennie Seed Co	33	702	3	437
Red Eckendorfer	General Swedish Seed Co., Svalof	33	722	3	214
Svalof Original Rubra	General Swedish Seed Co., Svalof	28	22	3	80
Fjerritsley Barres	Hjalmar, Hartman & Co., Copenhagen	34	1,393	2	1,972
Barres Oval	General Swedish Seed Co., Svalof	31	1,214	2	1,882
Giant Yellow Globe	Wm. Ewing Co	36	1,898	2	1,868
Eckendorfer Red	Hjalmar, Hartman & Co., Copenhagen	33	1,522	2	1,707
Golden Tankard	Wm. Ewing Co	27	1,304	2	1,655
Yellow Globe	Wm. Rennie Seed Co	36	620	2	1,466
Golden Tankard	Wm. Rennie Seed Co	26	216	2	1,131
Sugar Beets					
Dieppe		15	521	3	1,056
Frederiksen		15	243	3	865
Buszczynski		13	914	3	400

Mangel variety test. Mangels are destined to become an important crop on farms where club-root is prevalent.

KALE AND RAPE—VARIETY TEST

Five varieties of kale and four varieties of rape were sown on May 18 and were thinned to 4-6 inches on June 8. The kale was cut on September 3. One variety of rape, viz., Small Seeded German Summer rape began to bloom and was cut on July 22. The remaining varieties of rape were cut on September 3. The yields are shown in table 25.

TABLE 25.—KALE AND RAPE—VARIETY TEST

Name of variety	Source of Seed	Yield per acre			
		Green weight		Dry weight	
		tons	lb.	tons	lb.
Kale					
Improved 1,000-headed Kale	Sutton & Sons, England	22	540	2	695
1,000-headed Kale	Sutton & Sons, England	21	635	2	479
Green Marroe Stemmed Kale	E. Webb & Sons, England	22	1,575	2	405
Sheep Kale	Sutton & Sons, England	22	486	2	64
Purple Stemmed Marrow Kale	E. Webb & Sons, England	19	1,858	1	1,765
Rape					
Giant Rape	Sutton & Sons, England	29	98	3	181
Large Seeded Winter Umbrella Rape	Vilmorin, Andrieux Co	29	1,568	2	1,917
Large Seeded Winter Common Essex	Vilmorin, Andrieux Co	24	842	2	1,156
Small Seeded Turnip Rape or German Summer Rape	Vilmorin, Andrieux Co	1	1,771	—	371

CORN—VARIETY TEST

Two-thirds of each plot of the land used for variety tests of corn was in grain and one-third in fibre crops the previous year. This spring 15 tons manure per acre was applied broadcast on the stubble and ploughed under. The land was then disked and given a broadcast application of 800 pounds 2-8-3 home-mixed fertilizer per acre. The fertilizer was mixed with the land by means of the spring-tooth and smoothing harrows.

The corn was planted in hills three feet apart each way. When the corn was up six inches two plots of each variety were thinned to three plants to a hill and two plots of each variety were thinned to four plants to a hill. The area of each plot was 297 square feet when the outside hills were removed. In harvesting, all hills with misses were discarded.

When harvesting a five pound composite sample was taken of each plot and sent to Ottawa for dry matter determination.

The results are shown in table 26.

TABLE 26.—CORN—VARIETY TEST

Name of variety	Source of Seed	Degree of maturity	Yield per acre			
			Green weight		Dry weight	
			tons	lb.	tons	lb.
Lancaster County Sure Crop.	A. H. Hoffman	In silk	20	1,589	2	1,169
Burr Leaming	G. S. Carter	In silk	18	1,831	2	815
Hybrid	Twitchell's Prixe x Wisconsin No. 7.	Kernels not formed to early milk.	16	412	2	742
Wisconsin No. 7	J. O. Duke Seed Co	In silk to kernels formed	15	1,134	2	573
White Capped Yellow Dent	Steel-Briggs	In silk	17	1,081	2	556
Hybrid	A. Wimple	In silk to kernels forming	17	15	2	478
Compton's Early	J. O. Duke Seed Co	In silk	16	558	2	189
Northwestern Red Dent	Wm. Rennie Seed Co	In milk to early milk	15	1,475	2	162
North Dakota	Steel-Briggs	Silk to kernels forming	16	744	2	91
Longfellow	Popp & Lang	In silk	16	969	2	45
Leaming	J. O. Duke Seed Co	In silk	13	1,900	1	1,996
Quebec 28	Macdonald College	Beginning to come in milk to early dough.	12	1,136	1	1,978
Golden Glow	J. O. Duke Seed Co	In silk	14	348	1	1,961
Northwestern Dent	Macdonald college	Kernels forming to late dough.	13	1,783	1	1,903
Yellow Dent	A. Wimple	In silk	15	43	1	1,895
Disco 90-Day White Dent	Dakota Improved Seed Co.	In silk to kernels forming. ing.	14	1,473	1	1,882
Longfellow	J. O. Duke Seed Co	In silk to kernels forming.	15	852	1	1,865
Northwestern Dent	A. E. MacKenzie No. 2.	Kernels forming to late milk.	13	985	1	1,746
Pride Yellow Dent	Dakota Improved Seed Co.	Silk to early milk	12	304	1	1,690
Disco Northwestern Red Dent.	Dakota Improved Seed Co.	Silk to kernels forming	14	106	1	1,668
Twitchell's Pride	Fredericton	Kernels forming to early dough.	11	1,621	1	1,659
Northwestern Dent	O. Will	Late milk to early dough	11	1,628	1	1,624
Twitchell's Pride (inbred)	Fredericton	Kernels forming to early dough.	11	637	1	1,594
Northwestern Dent	A. E. MacKenzie No. 1.	Early to late milk	12	300	1	1,526
Northwestern Dent	Brandon Experimental	Late milk to early dough	9	178	1	1,105
Amber Flint	A. Wimple	Kernels forming to medium milk.	11	534	1	967

CORN BREEDING

Corn breeding work was continued with Twitchell's Pride corn—a flint variety—in order to secure a strain that would retain its present early maturing qualities, and yield a higher tonnage of silage. Tests are also being made of the value of this corn for crossing. A hybrid between this variety and Wisconsin No. 7 has been grown at this Station for four years for ensilage purposes. This hybrid is one of our highest yielding strains, giving practically the same yield as Wisconsin No. 7 and being decidedly earlier. Intercrosses have also been made between a number of the inbred strains of Twitchell's Pride. A few crosses have been made with Howes Alberta Flint. This hybrid is earlier than the Twitchell's Pride and a more vigorous grower than Howes Alberta Flint.

OTHER EXPERIMENTS

Experiments are also being carried on with alfalfa, red clover seed growing, and pasture clover, results of which will be published when more data accumulate.

EXPERIMENTS WITH FERTILIZERS

The work carried on during the year in co-operation with the Division of Chemistry, included fertilizer formulae experiments with a three-year rotation of potatoes, grain and hay; an experiment to determine the value of basic slag, rock phosphate and superphosphate as a source of phosphoric acid; experiments with various fertilizer treatment for improving pasture lands; an experiment with fertilizer formulae for a growing apple orchard; an experiment to determine effect of nitrate of soda on the quality of fruit in an apple orchard; an experiment with nitrate of soda on hay land; experiments to determine the value of cyanamide and urea as sources of nitrogen for a potato, grain and hay rotation; an experiment to determine the value of ammo-phos as a source of nitrogen and phosphoric acid for a potato, grain and hay rotation; an experiment with different sources of nitrogen on a grain crop; and an experiment to determine the effect of gypsum on crop yield in a potato, grain and hay rotation, also the influence of gypsum on the development of potato scab.

STOCK CARRYING PROPERTIES OF NEW BRUNSWICK PASTURES, SLAGGED VERSUS UNSLAGGED

In order to determine the merit of Bessemer slag for improving New Brunswick pastures, two plots one and one-half acre each were laid out in 1923. The field in which these plots were located was heavy clay loam. It grew a crop of oats in 1918 and has been in permanent pasture since that date. On May 14, 1923, one plot was given an application of Anglo-Canadian Company's Bessemer basic slag (16 per cent P_2O_5 at the rate of 750 pounds per acre). Both plots were pastured with sheep from May 30 to August 14, inclusive. The five ewes and nine lambs on the slagged plot made gains of 145 pounds per acre and the four ewes and seven lambs on the unslagged plot made gains of 128·3 pounds per acre. In 1924 the plots were reduced to one acre each and pastured with sheep from May 30 to August 19, inclusive. The seven ewes and seven lambs on the slagged acre made gains of 122 pounds per acre and the six ewes and six lambs on the unslagged acre made gains of 122·5 pounds per acre.

In the springs of 1923 and 1924 the grass on the slagged plot was much more luxuriant than the grass on the unslagged plot, therefore, more sheep were put on the slagged plot each year in order to keep it as closely grazed as the unslagged plot. The gains on both plots were practically the same in 1924. This may have been due to the amount of grass necessary to maintain the extra sheep on the slagged plot. In order to obtain data on the amount of grass produced on each plot, hay was cut on both plots in 1925. The slagged acre yielded 2,500 pounds of hay and the unslagged acre 2,450 pounds of hay. There was considerable more hay on the slagged acre but part of the plot lodged badly and could not be cut close, while the unslagged acre did not lodge.

In the spring of 1926 the slagged plot was given another application of 750 pounds Anglo-Canadian Chemical Company's Bessemer basic slag (16 per cent P_2O_5 per acre).

In 1923 and 1924 the plots were kept closely grazed by heavy stocking. In order to keep the slagged plot as closely grazed as the unslagged plot, it was necessary to keep more animals on this plot. The maintenance of these extra animals made it difficult to interpret results and the ewes and lambs were

injured by the heavy stocking. Therefore, since 1926 the same number of ewes and lambs were kept on each plot and an effort made to limit the number of animals on the plots to the carrying capacity of the slagged plot.

Three ewes and five lambs were pastured on each plot in 1926. This was found too many to allow the lambs to develop properly. Therefore, in 1927 each plot was pastured with three ewes and three lambs. As 1927 was a much better pasture year than 1926, it is possible that the plots would have maintained as many sheep as the previous year without any injury to the lambs. In 1926 and 1927 the sheep were put on the plots on June 1. In 1926 the sheep and lambs were removed on August 1. In 1927 the sheep were removed on August 1, but the growth on the plots was so luxuriant that the lambs were left on the plot until September 1.

In order to allow the grass to get well started the sheep were purposely kept off the plots in 1926 and 1927 until the first of June. When the sheep were put on the pasture, however, feed was abundant and they only grazed the choicest herbage with the result that a large percentage of the brown top went to seed each year. Therefore in order to ascertain if this condition would be remedied if the plots were grazed earlier, the sheep were put on the plots this year on May 22. Much less grass went to seed than in previous years, and the plots had a green appearance throughout the entire season. Indeed it is possible that they could be put on at an even earlier date.

This year each plot was pastured with the same number of sheep as in 1927, viz., three ewes and three lambs. On August 1 the plots looked so good that the sheep were left on them until August 31. There appeared to be abundant grass on the plots during August but when the sheep were weighed on August 31, those on the slagged plot had only gained five pounds while those on the unslagged plots had lost fifteen pounds. The unsatisfactory results in August were possibly due to the sheep prefering to go hungry rather than eat soiled herbage. It is possible, however, that owing to the small area on which they were pastured they became infested with internal parasites. The results for 1926, 1927, and 1928 are given in table 27. (Project C96.)

TABLE 27.—STOCK CARRYING PROPERTIES OF NEW BRUNSWICK PASTURES, SLAGGED VERSUS UNTREATED

	1926		1927		1928	
	Slagged	Unslagged	Slagged	Unslagged	Slagged	Unslagged
Date going on plot	June 1	June 1	June 1	June 1	May 21	May 21
Date removed from plot	Aug. 1	Aug. 1	*Aug. 1	*Aug. 1	Aug. 31	Aug. 31
Weight of ewes going on plot..... lb.	344·0	304·5	340·0	375·0	341·0	369·0
Weight of ewes coming off plot..... lb.	376·0	326·0	379·0	405·0	379·0	376·0
Total gain of ewes..... lb.	32·0	21·5	39·0	30·0	38·0	7·0
Weight of lambs going on plot..... lb.	170·5	138·5	99·0	123·5	121·0	122·5
Weight of lambs coming off plot.... lb.	335·0	274·5	166·5	187·5	211·0	165·0
Total gain of lambs..... lb.	164·5	136·0	67·5	64·0	90·0	42·5
Total gain of ewes and lambs..... lb.	196·5	157·5	106·5	94·0	128·0	49·5
Value of gain of ewes at 5 cents per pound..... $	1 60	1 08	1 95	1 50	1 90	0 35
Value of gain of lambs at 10 cents per pound..... $	16 45	13 60	6 75	6 40	9 00	4 25
Value total gain..... $	18 05	14 68	8 70	7 90	10 90	4 60
Value extra gain from use of slag... $	3 37	.....	*0 80	.....	6 30	.....

*After weaning on August 1, 1927, both groups of lambs were returned to their respective pastures until September 1. The lambs on the unslagged pasture made gains of 4·5 pounds while those on the slagged pasture made gains of 27 pounds, a difference of 22·5 pounds in favour of the slagged acre. The additional gains at ten cents per pound are equal to $2.25 making with the gains before August 1 a total of $3.05 per acre extra gain from the use of slag.

A total of 1,500 pounds per acre of basic slag has been applied to the slagged plot, half being applied in 1923 and half in 1926. It is difficult to estimate the value of the basic slag from 1923-26 owing to more sheep being kept on the slagged plot. In 1926-1928 inclusive, the value of the extra gains made by the sheep and lambs on the slagged plot was $12.72. At $21.30 per ton each application of basic slag cost $7.99 or a total of $15.98. Therefore, the gains the last three years have paid for over three-fourths of the cost of the total fertilizer applied to this plot and the appearance of the slagged plot in the fall indicated that even if the first three summer's results are discarded the increased gains on the slagged plot eventually will pay the cost of the entire application of fertilizer.

CLOSE GRAZING EXPERIMENT

In order to determine the merits of close grazing, alternating pastures and heavy applications of nitrogenous fertilizer, a pasture improvement experiment was started at the Station this year. The procedure followed and a summary of results for the summer is given under summer feeding page 4 in the animal husbandry section of this report. This work will be reported fully when further work has been done and more definite conclusions can be drawn.

NITRATE OF SODA ON HAY LANDS

This experiment was begun in 1925 to determine which rate and dates of applying nitrate of soda to hay lands would have the most economic value. The nitrate of soda was applied at the rates and dates shown in table 28. The first date of application each year was when commencement of growth was noted except in the case where the first application was on May 18, 1925. This second series of plots was laid out when it was apparent that a large percentage of the growth on the plots of the first series which had the first application on May 6, 1925, consisted of daisies. From 1925 to 1927 inclusive the nitrate of soda was applied to second year hay in a four-year rotation of hoed crop, grain, hay and hay. The four-year rotation was discontinued in 1927 and a six-year rotation of hoed crop, grain, hay, hay, hay and grain was substituted. Because of the change in the rotation the plots which were used in 1927 were in hay again this year. In order to see if the results would be the same, each plot was given the same treatment as the previous year.

The grass mixture used on the land treated in 1925 and 1926 contained 10 pounds timothy, 8 pounds red clover and 2 pounds alsike. The grass mixture used on the land treated in 1927 and 1928 contained 10 pounds timothy, 8 pounds red clover, 4 pounds alsike and 2 pounds alfalfa. Growing conditions were average in 1925 and 1926 and were exceptionally good in 1927 and 1928. The results are given in table 28.

TABLE 28.—NITRATE OF SODA ON HAY LAND

Rate and date of application of nitrate of soda per acre				Yield of hay per acre			Increase over checks	Cost of nitrate of soda per acre	Cost of increase per ton
		1925		1st cutting	2nd cutting	Total			
May 6	May 26	June 12		lb.	lb.	lb.	lb.	$ cts.	$ cts.
lb.	lb.	lb.							
100	....	....	.....	2,986	.....	2,986	853	3 18	7 45
50	50	....	.....	3,093	.....	3,093	960	3 18	6 62
200	....	....	.....	3,413	.....	3,413	1,280	6 35	9 92
100	100	....	.....	2,733	.....	2,733	1,600	6 35	7 93
300	....	....	.....	4,160	.....	4,160	2,027	9 53	9 40
100	100	100	.....	4,106	.....	4,106	1,973	9 53	9 66
Check	....	....	.....	2,133	.....	2,133	.....	.....	.....

TABLE 28.—NITRATE OF SODA ON HAY LAND—*Concluded*

Rate and date of application of nitrate of soda per acre				Yield of hay per acre			Increase over checks	Cost of nitrate of soda per acre	Cost of increase per ton
				1st cutting	2nd cutting	Total			
				lb.	lb.	lb.	lb.	$ cts.	$ cts.
1925									
May 18 lb.	June 6 lb.	June 20 lb.							
100	....	....	.....	5,276	.....	5,276	611	3 18	10 40
50	50	....	.....	5,594	.....	5,594	929	3 18	6 84
200	....	....	.....	5,385	.....	5,385	720	6 35	17 63
100	100	....	.....	5,497	.....	5,497	832	6 35	15 26
300	....	....	.....	5,741	.....	5,741	1,076	9 53	17 71
100	100	100	.....	5,637	.....	5,637	972	9 53	19 61
Check	....	....	.....	4,665	.....	4,665	.....	.....	.....
1926									
May 13 lb.	May 29 lb.	June 11 lb.							
100	100	....	.....	4,879	.....	4,879	924	3 18	6 88
50	50	....	.....	5,368	.....	5,368	1,413	3 18	4 50
200	....	....	.....	5,285	.....	5,285	1,330	6 35	9 55
100	100	....	.....	5,107	.....	5,107	1,152	6 35	11 02
300	....	....	.....	5,285	.....	5,285	1,285	9 53	14 83
100	100	100	.....	5,427	.....	5,427	1,472	9 53	12 95
Check	....	....	.....	3,955	.....	3,955	.....	.....	.....
1927									
April 20 lb.	May 6 lb.	May 23 lb.							
100	....	....	.....	5,449	2,233	7,682	1,272	3 13	4 92
50	50	....	.....	4,896	2,019	6,915	505	3 13	12 40
200	....	....	.....	5,020	1,894	6,914	504	6 25	24 80
100	100	....	.....	5,601	1,845	7,446	1,036	6 25	12 07
300	....	....	.....	5,512	2,046	7,558	1,148	9 38	16 34
100	100	100	.....	5,098	2,154	7,252	842	9 38	22 28
Check	....	....	.....	4,392	2,018	6,410	.....	.....	.....
1928									
May 2 lb.	May 17 lb.	May 30 lb.							
100	....	....	.....	4,632	.....	4,632	1,279	2 89	4 52
50	50	50	.....	4,405	.....	4,405	1,052	2 89	5 49
200	....	....	.....	4,171	.....	4,171	818	5 78	14 13
100	100	....	.....	5,002	.....	5,002	1,649	5 78	7 01
300	....	....	.....	5,065	.....	5,065	1,712	8 67	10 13
100	100	100	.....	4,487	.....	4,487	1,134	8 67	15 29
Check	....	....	.....	3,353	.....	3,353	.....	.....	.....

The results to date indicate:—

(1) That applications of 100 pounds of nitrate of soda per acre are the most profitable as a top dressing for second-year hay.

(2) That when the total amount of nitrate of soda is applied at commencement of growth the yield will be approximately the same as when half the nitrate of soda is applied at commencement of growth and the balance two or three weeks later.

POULTRY

The stock on hand December 31, 1928, consisted of Barred Rocks: males, 15, hens 431, chickens 214.

Feeding, breeding and hatching experiments, begun in previous years were continued during the season. The eighth New Brunswick Egg Laying Contest was successfully concluded. All previous individual records were broken and a new Canadian record made for Barred Rocks by Lancaster No. 7-F, owned by Mrs. Edward Hart of Grand Bay, Kings county. This splendid hen laid 324 eggs with 354·6 points in fifty-one weeks, 330 eggs with 361·8 points in fifty-two

weeks, and 332 eggs with 364·2 points in 365 days from the date of first egg. This bird is a good representative of utility Barred Rocks and weighed at the conclusion of the contest 6·3 pounds.

HATCHING RESULTS

The majority of our eggs were hatched in a 2,400-egg Buckeye incubator. A small hatch was taken off a 600-egg Ideal machine. The results for the season show a considerable improvement over the hatching results of recent years, probably being due in part to the elimination of fowl typhoid in the flock.

BEST DATE FOR INCUBATION

The greatest fertility was obtained from the May 15 setting, followed by settings of April 14 and April 6. Hatchability, as shown by the percentage of fertile eggs hatched, was best from the May 15 setting, followed by settings made April 21, March 29 and March 20. Viability, as shown by the percentage of chicks hatched that were alive when banded, was best from the March settings.

HATCHING RESULTS FROM HENS AND PULLETS

—	Hens	Pullets
Per cent fertile	89·89	75·92
Per cent total eggs hatched	43·02	26·0
Per cent fertile eggs hatched	47·86	34·25
Per cent chicks hatched alive when wing-banded	80·12	89·04
Total eggs required for one chick hatched	2·32	3·84
Total fertile eggs required for one chick hatched	2·08	2·91
Total eggs required for one chicken when wing-banded	2·90	4·31

NOTE.—The fertility and hatchabilty, as shown by percentage of fertile eggs hatched, were decidedly in favour of the hens as breeders.

SKIM-MILK VERSUS BEEF SCRAP VERSUS FISH MEAL

This experiment was carried on during a six months' period from December 1, 1927, to May 31, 1928, to determine the relative value of these products as protein feeds for laying hens. Fifteen Barred Rock pullets were included in each pen in this experiment and dead birds were not substituted. The system of feeding was as follows:

All pens were fed a scratch grain mixture consisting of 200 pounds cracked corn, 200 pounds wheat and 100 pounds oats. Pen 1 was fed a dry mash in hoppers, consisting of 100 pounds wheat bran, 100 pounds wheat middlings, 100 pounds corn meal, 100 pounds crushed oats, 45 pounds of beef scrap and 5 pounds of charcoal. Pen 2 was fed a mash of the same composition as pen 1, excepting that the beef scrap was omitted and skim-milk was fed at the rate of one quart daily per fifteen birds. Pen 3 was fed a mash similar to that of pen 1, excepting that fish meal was fed instead of beef scrap. The average production for the year, as well as for the two previous years and the average to date, is shown in table 29.

TABLE 29.—BEEF SCRAP VERSUS SKIM-MILK VERSUS FISH MEAL FOR EGG PRODUCTION

Average Egg Production—Six-month Period

Year	Beef scrap	Skim-milk	Fish meal
1926	90·55	84·58	85·76
1927	75·85	96·54	91·38
1928	99·04	90·5	96·67
Average	88·48	90·54	91·27

The average for the three-year period shows that fish meal and skim-milk have been a little superior to beef scrap.

SUMMARY OF HATCHING RESULTS FOR THREE YEARS FROM PULLETS FED BEEF SCRAP VERSUS FISH MEAL VERSUS SKIM-MILK

Fertility—

Regular mating—Highest when fish meal was fed, followed closely by skim-milk.
Males alternated—Highest when beef scrap was fed, followed by fish meal.
All matings—Highest when fish meal was fed, followed closely by skim-milk and beef scrap.

Hatchability—as shown by percentage fertile eggs hatched—

Regular mating—Highest when skim-milk was fed, followed by beef scrap. Fish meal very low.
Males alternated—Highest when beef scrap was fed, followed by skim-milk and fish meal.
All matings—Highest when skim-milk was fed, followed closely by beef scrap. Fish meal low.

Per cent total eggs hatched—

Regular mating—Highest when skim-milk was fed, followed by beef scrap. Fish meal pen low.
Males alternated—Highest when beef scrap was fed. Skim-milk very little better than fish meal.
All matings—Highest when skim-milk was fed, followed closely by beef scrap. Fish meal pen low.

STANDARD (HOME MIXED) RATION CONTAINING CORN VERSUS RATION MADE FROM HOME-GROWN GRAING WITHOUT CORN VERSUS RATION CONTAINING HOME-GROWN GRAINS FED SINGLY

The experiment, begun in 1926, to determine the value of home-grown grains for poultry feeding, and also to determine the value of feeding a scratch grain mixture and a mash in hoppers, in comparison with the practice sometimes adopted by small flock owners of feeding grains singly, was continued.

Group 1 was fed a standard ration of scratch grains consisting of 200 pounds cracked corn, 200 pounds wheat, and 100 pounds oats, and a mash (fed in hoppers) consisting of 100 pounds wheat bran, 100 pounds wheat middlings, 100 pounds corn meal, 100 pounds crushed oats, 50 pounds beef scrap and 5 pounds charcoal. Grit, oyster shell, green feed, skim-milk and water were also supplied.

Group 2 was fed a ration of scratch grain consisting of 200 pounds wheat, 100 pounds buckwheat and 100 pounds oats, and a mash fed in hoppers consisting of 100 pounds wheat bran, 100 pounds wheat middlings, 100 pounds crushed oats, 100 pounds buckwheat meal and 5 pounds charcoal. Grit, oyster shell, green feed and water were also supplied.

Group 3 was fed on whole oats, buckwheat and wheat, fed singly and in no definite order. A moist mash of crushed oats was fed at mid-day. This group received skim-milk occasionally. Grit, oyster shell, green feed and water were also supplied.

This experiment ran from December 1, 1927, to May 31, 1928. There were fifteen Barred Rock pullets in each pen at the beginning of the experiment. Birds that died were not substituted. The average production for the period, as well as for the same period during the two previous years, and the average to date, are shown in table 30.

TABLE 30.—AVERAGE EGG PRODUCTION—SIX-MONTH PERIOD

Year	Standard ration	Ration with buckwheat replacing corn	Grains fed singly
1926	81·67	80·43	62·4
1927	89·85	96·01	85·05
1928	99·33	98·46	91·84
Average	90·28	91·63	79·76

The results indicate that buckwheat is a valuable feed for egg production.

SUMMARY OF HATCHING RESULTS FOR THREE YEARS FROM PULLETS FED STANDARD RATION CONTAINING CORN VERSUS RATION WITH BUCKWHEAT REPLACING CORN, VERSUS GRAINS FED SINGLY.

Fertility—

Regular mating—Highest where birds were fed standard ration, lowest where grains were fed singly.

Males alternated—Highest where birds were fed grains singly; lowest where buckwheat replaced corn.

All matings—Highest where standard ration was fed, followed by buckwheat.

Percentage of fertile eggs hatched—

Regular mating—Highest where grains were fed singly; buckwheat and corn about equal.

Males alternated—Highest where grains were fed singly, lowest where buckwheat replaced corn.

All matings—Highest where grains were fed singly; lowest where buckwheat replaced corn.

Percentage of total eggs hatched—

Regular mating—Highest where grains were fed singly, followed by ration containing corn.

Males alternated—Highest where grains were fed singly, lowest where buckwheat replaced corn.

All matings—Highest where grains were fed singly, lowest where buckwheat replaced corn.

POTATOES AS A SUBSTITUTE FOR CORN MEAL IN THE LAYING MASH

This experiment was begun in 1926 to determine the value of small unmerchantable potatoes as a substitute for corn meal in the laying mash.

Group 1 was fed a scratch grain consisting of 200 pounds cracked corn, 200 pounds wheat, 100 pounds oats and a mash containing 100 pounds corn meal, 100 pounds wheat bran, 100 pounds wheat middlings, 100 pounds crushed oats and 5 pounds charcoal, fed in a hopper. Grit, oyster shell, milk, green feed and water were also supplied.

Group 2 was fed the same scratch grain mixture as Group 1. Instead of receiving a dry mash as Group 1, they were fed, twice a day, a moist mash consisting of equal parts wheat bran, wheat middlings and crushed oats mixed with boiled potatoes. The proportions fed were two parts of potatoes (raw weight) and one part mash. Grit, oyster shell, milk, green feed and water were also supplied.

This experiment ran from December 1, 1927, to May 31, 1928. There were fifteen Barred Rock pullets in each pen at the beginning of the experiment and dead birds were not substituted.

The average production for the period, as well as the average for the same period in the two previous years and the average to date, are shown in table 31.

TABLE 31.—POTATOES AS A SUBSTITUTE FOR CORN MEAL IN LAYING MASH

Average Egg Production—6-month Period

Year	Corn meal in mash	Potatoes in mash
1926	85·96	83·71
1927	78·91	86·18
1928	82·41	96·19
Average three years	82·43	88·69

The results indicate that potatoes are a valuable feed for egg production.

SUMMARY OF HATCHING RESULTS FOR THREE YEARS FROM PULLETS FED STANDARD RATION VERSUS A RATION WHERE POTATOES REPLACED CORN MEAL IN THE MASH.

Fertility—

Regular mating—Highest where potatoes replaced corn.
Males alternated—Highest where potatoes replaced corn.
All matings—Highest where potatoes replaced corn.

Hatchability—as shown by percentage fertile eggs hatched—

Regular mating—Practically the same from each pen.
Males alternated—A little higher where potatoes were fed.
All matings—The same from each pen.

Per cent total eggs hatched—

Regular mating—Highest where potatoes replaced corn.
Males alternated—The same from each ration.
All matings—Highest where potatoes replaced corn.

TURNIPS VERSUS MANGELS VERSUS POTATOES VERSUS EPSOM SALTS FOR WINTER EGG PRODUCTION

This experiment was begun in 1926 to determine the relative value of turnips, mangels and potatoes as green feed and also to test out Epsom salts as a substitute for green feed. Four pens of Barred Rock pullets were used for this experiment, which ran from December 1, 1927, to May 31, 1928.

Group 1 was fed mangels as green feed.
Group 2 was fed swedes as green feed.
Group 3 was fed raw potatoes as green feed.
Group 4 was fed no green feed but was fed Epsom salts in the drinking water at the rate of 1½ to 2 ounces for fifteen birds per day.

The average egg production for the six months' period in 1928, the average production for six months' period in 1927, and average production for five months' period in 1926, as well as the average to date, are shown in table 32.

TABLE 32.—TURNIPS VERSUS MANGELS VERSUS POTATOES VERSUS EPSOM SALTS

Average Egg Production—Five months period 1926—Six months period 1927-28

—	Mangels	Swedes	Potatoes	Epsom salts
1926	55·62	65·35	61·50	50·0
1927	60·36	66·12	62·99	56·34
1928	84·16	85·21	88·55	83·82
Average three years	66·71	72·23	71·01	63·38

The results indicate that Epsom salts are not a satisfactory substitute for green feed. Swedes or potatoes appear to be superior to mangels.

SUMMARY OF HATCHING RESULTS FOR THREE YEARS FROM PULLETS FED DIFFERENT SOURCES OF GREEN FEED—MANGELS VERSUS POTATOES VERSUS EPSOM SALTS AS A SUBSTITUTE FOR GREEN FEED.

Fertility—

Regular mating—Highest where swedes were fed, followed by potatoes. Lowest where mangels were fed.
Males alternated—Highest where swedes were fed, followed by potatoes. Lowest where Epsom salts were fed.
All matings—Highest where swedes were fed, followed by potatoes.

Hatchability—as shown by percentage of fertile eggs hatched—

Regular mating—Highest where Epsom salts were fed, followed by potatoes.
Males alternated—Highest where mangels and potatoes were fed.
All matings—Potatoes and Epsom salts practically equal.

Per cent total eggs hatched—

Regular mating—Highest where Epsom salts were fed, followed by potatoes.
Males alternated—Potatoes and mangels practically equal.
All matings—Highest where potatoes and Epsom salts were fed.

FEEDS FOR FERTILITY, HATCHABILITY AND VIABILITY

Experiments were begun in 1926 to determine the value of supplementary feeds such as cod liver oil, raw liver, bone meal and various combinations of these when fed to breeding hens. During the present year birds were fed as follows:—

Group 1 was used as a check and was fed a standard ration of scratch grain with mash in hoppers. Scratch grain consisted of 200 pounds cracked corn, 200 pounds wheat and 100 pounds oats. The mash consisted of 100 pounds corn meal, 100 pounds wheat middlings, 100 pounds wheat bran, 100 pounds crushed oats, 50 pounds beef scrap and 5 pounds charcoal. Grit and oyster shell were supplied in hoppers and mangels were fed as green feed. Some milk was supplied and water was always available.

Group 2 was fed the same as the check with the addition of one-quarter teaspoon of cod liver oil per bird daily. The cod liver oil was fed in a moist mash of the same composition as that fed in the hopper.

Group 3 was fed the same as the check with the addition of one-half ounce of raw liver per bird daily. The liver was chopped fine and fed in a wet mash. The liver used was largely from pigs.

Group 4 was fed the same as the check with the addition of a quarter ounce of raw liver and one-eighth teaspoon cod liver oil per bird per day.

Group 5 was fed the same as check with the addition of a quarter ounce raw liver and one-eighth teaspoon cod liver oil per bird per day. Two and one-half per cent bone meal was added to the mash. Liver and cod liver oil were fed in a moist mash.

The experiment was divided into two periods, with a week between them. During the first period the hens in each pen were mated to the male bird assigned to their particular pen. During the second period, the male birds were changed from pen to pen daily. They were allowed to alternate for a week before the eggs were saved for the second period. The results are shown in table 33.

TABLE 33.—FEEDS FOR FERTILITY, HATCHABILITY AND VIABILITY

Pen	Feed	Mating period	Eggs set	Fertile	Hatched	Per cent fertile	Per cent fertile hatched	Per cent total hatched
Group 1...	Check.....	Regular mating.....	214	198	66	92·52	33·33	30·84
		Males alternated....	42	37	25	88·09	67·57	59·52
		Total.....	256	235	91	91·79	38·72	35·54
Group 2...	Cod liver oil..	Regular mating.....	227	209	90	92·07	43·06	39·64
		Males alternated....	48	46	29	95·83	63·04	60·41
		Total.....	275	255	119	92·72	46·66	43·27
Group 3...	Liver.....	Regular mating.....	264	212	123	80·30	58·02	46·59
		Males alternated....	59	56	43	94·91	76·78	72·88
		Total.....	323	268	166	82·97	61·94	51·39
Group 4...	Cod liver oil and liver.	Regular mating.....	277	261	146	94·22	55·93	52·70
		Males alternated....	51	48	35	94·11	72·92	68·62
		Total.....	328	309	181	94·20	58·57	55·18
Group 5...	Cod liver oil, liver and bone meal.	Regular mating.....	243	184	79	75·72	42·93	32·52
		Males alternated....	58	56	34	96·55	60·71	58·62
		Total.....	301	240	113	79·73	47·08	37·54

Experiments have been carried on for three years to determine the value of cod liver oil, liver and a combination of cod liver oil and liver, when fed to breeding hens. The following is a summary of the results:—

Fertility—

Regular mating—Highest where cod liver oil was fed with liver, followed by cod liver oil. Fertility in pen fed liver lower than in check.

Males alternated—Highest where cod liver oil was fed, followed by the cod liver oil-liver combination. Fertility in pen fed liver slightly above check.

All matings—The cod liver oil-liver combination and cod liver oil gave practically the same results.

Hatchability as shown by percentage of fertile eggs hatched—

Regular mating—Highest where the cod liver oil-liver combination was fed, followed by cod liver oil.

Males alternated—Highest where the cod liver oil-liver combination was fed. Other pens, excepting check, about equal.

All matings—Highest where the cod liver oil-liver combination was fed, followed by cod liver oil.

Percentage total eggs hatched--

Regular mating—Highest where cod liver oil-liver combination was fed, followed by cod liver oil and liver.
Males alternated—Highest where cod liver oil-liver combination was fed, followed by cod liver oil.
All matings—Highest where cod liver oil-liver combination was fed, followed by cod liver oil.

Experiments have been carried on for two years to determine the value of bone meal when fed to breeding hens. The following is a summary of the results:—

Fertility—

Regular mating—Highest in check pen.
Males alternated—Highest in check pen.
All matings—Highest in check pen.

Hatchability as shown by percentage of fertile eggs hatched—

Regular mating—Highest where bone meal was fed.
Males alternated—Highest in check pen.
All matings—Highest where bone meal was fed.

Percentage total eggs hatched--

Regular mating—Highest where bone meal was fed.
Males alternated—Highest in check pen.
All matings—Highest where bone meal was fed.

Experiments have been carried on for two years to determine the value of a combination of cod liver oil, liver and bone meal over the cod liver oil and liver combination. The results indicate that bone meal was of no value in increasing fertility. Hatchability was slightly better where bone meal was added.

FEEDING FOR FERTILITY AND HATCHABILITY HEAVY VERSUS LIGHT RATION

This experiment was begun January 1, the object being to determine the relative merits of a heavy and a light ration for breeding hens. Two pens of birds were fed according to the usual method of feeding at this Station, namely, as follows:—

Scratch grain—
200 pounds cracked corn.
200 pounds wheat.
100 pounds oats.

Dry mash—
100 pounds corn meal.
100 pounds wheat middlings.
100 pounds crushed oats.
100 pounds wheat bran.

The dry mash was fed in hoppers and on February 16, 50 pounds of beef scrap was added. Green feed, grit, shell and water were supplied daily.

Three pens were fed a modified ration as follows:—

Scratch grain—
100 pounds cracked corn.
200 pounds wheat.
200 pounds oats.

Only one-half as much scratch grain was fed this group as compared with Group 1.

A dry mash was fed in hoppers, as follows:—

100 pounds wheat middlings.
100 pounds crushed oats.
100 pounds wheat bran.
50 pounds beef scrap (added February 16).

Birds in second group were fed all the green feed they would consume. Grit, oyster shell and water were supplied daily.

The hatching results were taken for two different periods with a week between them. During the first period hens in each pen were mated to the male birds assigned to their particular pen. During the second period, the male birds were changed from pen to pen daily and were allowed to alternate a week before the eggs were saved for the second period. The hatching results for each period, as well as the total, are shown in table 34.

TABLE 34.—FEEDS FOR FERTILITY, HATCHABILITY AND VIABILITY

HEAVY VERSUS LIGHT RATION

—	Regular mating	Males alternated	All matings
Standard Ration			
Per cent fertile	88·85	96·51	90·28
Per cent total eggs hatched	22·54	52·32	28·07
Per cent fertile eggs hatched	25·37	54·21	31·10
Light Ration			
Per cent fertile	93·82	94·28	93·90
Per cent total eggs hatched	44·12	72·14	49·00
Per cent fertile eggs hatched	47·03	76·51	52·18

The percentage of fertile eggs hatched, as well as the percentage of total eggs hatched, was much better where the birds were fed the light ration.

CONTROL OF FOWL TYPHOID

Agglutination tests for fowl typhoid were made in February and October. This is the fifth year that this test has been made. The February test followed the test made in the previous autumn and the percentage of reactors was more than anticipated. The autumn test, however, was a fairly good one. The results are shown as follows:—

—	Number tested	Number reacted
February test—		
Hens	125	15
Cocks	10	.....
Pullets	241	15
Cockerels	31	.....
Autumn test—		
Hens	171	5
Cocks	18	1
Pullets	493	3
Cockerels	175	.....

The percentage reactors since this test was begun is as follows:—

	Per cent
1924	34·4
1925	3·93
1926	9·8
1927	20·41
1928, February	7·37
1928, October	1·05

EGG-LAYING CONTEST

The eighth New Brunswick Egg-Laying Contest was concluded on October 22. Twenty pens of ten birds each were entered in this contest, one pen was withdrawn. Two spare birds accompanied the original pen for substitution, if necessary. The score system, begun in 1926, devised to take into consideration size of eggs, was continued during the year. One point was deducted for each ounce that eggs averaged less than 24 ounces to the dozen, and one point was added for each ounce that eggs averaged over 24 ounces to the dozen. Eggs weighing more than 27 ounces to the dozen were considered as 27-ounce eggs, and eggs weighing less than 20 ounces to the dozen were not counted.

Registration was on the same basis as in previous years. Hens that laid 200 or more eggs averaging 24 ounces or more per dozen were registered, providing they were free from breed disqualifications.

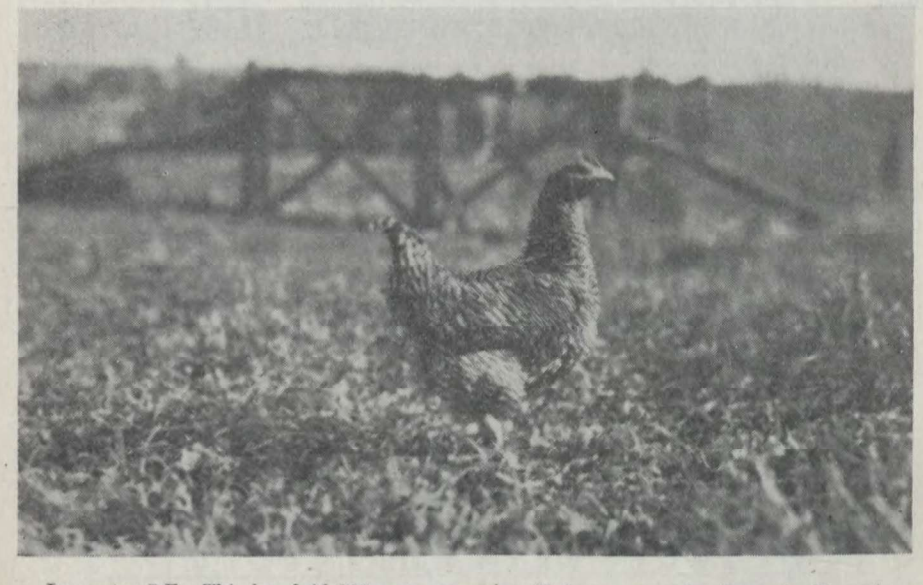
Ninety-two contest birds, including three spares moved up to replace original contest birds, laid 200 or more eggs.

Ninety-eight contest birds, including eight spare birds moved up to contest positions, had a credit of 200 or more points.

Seventy birds including four spares qualified for registration.

Twenty-six birds and three spares were disqualified for registration on account of small eggs.

Thirty-five hens died during the year, including six spares.



Lancaster 7-F. This hen laid 330 eggs, averaging 25.2 ounces to the dozen, in 52 weeks and holds the Canadian record for Barred Rocks.

Sixty-two second generation birds were entered in the contest. Twelve of these died, two were disqualified and twenty-eight qualified for registration.

The average production of the forty-eight second generation birds that completed the contest was 198·5 eggs and 202·3 points.

The average production for the year, as well as for each year since the contest began was as follows:—

Year	Eggs	Points
1921	152·13	.....
1922	139·43	.....
1923	162·25	.....
1924	165·00	.....
1925	164·7	.....
1926	183·38	185·58
1927	171·54	176·85
1928	186·4	194·7

The highest producing pens were:—

HIGH PRODUCING PENS

Name	Address	Breed	Eggs	Points
Mrs. Edward Hart	Grand Bay	B.R.	2,267	2,453·3
A. T. Reed	Rollingdam	B.R.	2,195	2,418·1
Experimental Station	Fredericton	B.R.	2,135	2,266·5
John Moore	Mouth Keswick	B.R.	2,135	2,227·0
John Woods	Bloomfield	B.R.	2,078	2,221·3
Ben Robichaud	St. Charles	B.R.	2,014	2,207·8

The list of contestants and individual records of the birds are shown in table 35. The upper line denotes egg production and the lower line denotes points.

TABLE 35.—EIGHTH NEW BRUNSWICK EGG LAYING CONTEST—FREDERICTON, N.B.

Pen	Name	Address	Breed	1	2	3	4	5	6	7	8	9	10	Total	Spare No. 1	Spare No. 2
1	W. A. Sansom	Durham Bridge	B.R.	207·0	184·0	222·0	200·0	215·0	162·0	158·0	242·0	229·0	210·0	2,029·0	162·0	253·0
				199·7	234·0	234·3	213·3	210·7	151·6	187·7	263·2	256·3	228·9	2,179·7	196·2	239·8
2	John Moore	Mouth Keswick	B.R.	137·0	213·0	235·0	x178·0	219·0	186·0	239·0	275·0	x228·0	225·0	2,135·0	.....	189·0
				146·1	233·6	197·9	207·7	269·6	168·8	249·3	285·2	239·2	229·6	2,227·0	.....	148·1
3	L. B. Johnston	Nashwaaksis	B.R.	Withd	rawn Fe	bruary	16									
4	Hayfield Bros.	Oromocto	B.R.	x119·0	167·0	212·0	214·0	225·0	xd82·0	154·0	x86·0	200·0	x148·0	1,607·0	.....	.....
				119·6	160·3	190·0	208·8	249·4	86·1	161·5	75·7	259·2	156·2	1,666·8	.....	.....
5	Experimental Station	Fredericton	B.R.	133·0	207·0	179·0	244·0	229·0	190·0	196·0	259·0	208·0	290·0	2,135·0	204·0	215·0
				160·3	220·6	214·7	231·2	220·2	233·2	166·1	293·9	213·3	312·9	2,266·5	192·4	213·7
6	W. E. B. Tait	Dorchester	B.R.	225·0	118·0	137·0	23·0	210·0	136·0	41·0	172·0	157·0	185·0	1,404·0	163·0	255·0
				250·9	133·0	159·6	20·5	203·4	106·3	30·0	147·0	149·3	208·3	1,408·3	137·5	256·7
7	C. M. Peart	Lewisville	B.R.	229·0	235·0	163·0	249·0	x122·0	222·0	d96·0	177·0	169·0	x197·0	1,859·0	.....	.....
				162·5	252·2	128·4	271·6	130·1	249·4	89·7	152·5	181·8	178·9	1,797·1	.....	.....
8	H. R. Babineau	St. Louis de Kent	B.R.	x213·0	284·0	184·0	153·0	89·0	254·0	244·0	208·0	221·0	216·0	2,066·0	.....	.....
				246·8	262·6	173·7	113·5	81·5	211·9	300·1	209·5	216·1	262·0	2,077·7	.....	.....
9	Ben Robichaud	St. Charles	B.R.	150·0	x167·0	230·0	210·0	196·0	x197·0	x175·0	239·0	195·0	255·0	2,014·0	x213·0	x224·0
				187·5	204·9	240·1	257·1	196·1	222·5	220·6	249·9	155·5	273·6	2,207·8	257·9	215·8
10	R. A. Snowball	Chatham	B.R.	d148·0	205·0	200·0	250·0	238·0	d110·0	208·0	170·0	xd50·0	212·0	1,791·0	.....	.....
				124·8	220·1	237·1	220·1	239·8	130·7	206·8	186·7	53·2	235·8	1,855·1	.....	.....
11	N. W. Eveleigh	Sussex	B.R.	x126·0	212·0	177·0	214·0	248·0	232·0	235·0	212·0	265·0	210·0	2,131·0	.....	.....
				115·2	189·0	190·5	198·3	236·4	245·7	201·6	239·2	300·1	229·5	2,145·5	.....	.....
12	John Woods	Bloomfield	B.R.	263·0	197·0	198·0	220·0	156·0	245·0	254·0	d219·0	190·0	136·0	2,078·0	196·0	193·0
				245·2	189·7	204·5	282·8	131·3	252·5	290·3	265·2	203·6	156·2	2,221·3	192·4	237·8
13	H. G. Harrison	Saint John	S.C.R.I.R	88·0	83·0	145·0	63·0	63·0	174·0	x126·0	x7·0	d30·0	160·0	941·0	.....	.....
				113·9	98·7	162·3	76·1	61·1	224·1	151·6	6·6	26·2	168·0	1,088·6	.....	.....
14	George Wood	Carter's Pt	B.R.	d88·0	x203·0	x204·0	247·0	x203·0	183·0	123·0	269·0	x178·0	208·0	1,906·0	.....	.....
				107·6	211·3	187·4	264·9	212·1	153·3	101·5	306·9	185·4	208·5	1,938·9	.....	.....
15	James Monohan	Elmsville	B.R.	d172·0	226·0	x175·0	191·0	199·0	217·0	194·0	118·0	227·0	207·0	1,926·0	.....	198·0
				194·1	208·5	214·2	179·6	167·3	249·9	210·8	135·7	226·3	192·4	1,989·8	.....	194·3
16	A. T. Reed	Rollingdam	B.R.	213·0	208·0	212·0	151·0	227·0	271·0	196·0	208·0	225·0	284·0	2,195·0	210·0	190·0
				215·4	260·9	235·4	156·8	253·1	318·7	207·4	208·1	265·3	297·0	2,418·1	183·8	146·9
17	Mr. E. Hart	Grand Bay	B.R.	x195·0	244·0	x165·0	211·0	227·0	191·0	243·0	223·0	244·0	324·0	2,267·0	.....	.....
				193·2	251·7	187·0	242·3	274·0	235·1	232·4	229·1	253·9	354·6	2,453·3	.....	.....
18	Miss Helen Parks	Saint John	S.C.W.L.	122·0	131·0	213·0	241·0	208·0	189·0	204·0	205·0	177·0	182·0	1,872·0	215·0	148·0
				125·3	139·9	209·2	215·2	194·4	198·3	192·0	205·3	160·3	214·5	1,854·4	239·7	158·8
19	Arthur Pringle	Stanley	R.C.B.L.	220·0	127·0	113·0	85·0	78·0	141·0	133·0	118·0	151·0	138·0	1,304·0	96·0	167·0
				217·0	136·6	101·6	101·7	80·9	155·3	110·9	136·3	135·8	160·6	1,336·7	97·8	167·3
20	Lakewood Poultry Farm	Saint John	S.C.W.L.	d114·0	202·0	236·0	231·0	x120·0	146·0	148·0	202·0	198·0	x176·0	1,773·0	.....	.....
				127·0	175·0	248·9	213·9	144·5	171·4	157·1	245·5	195·9	193·2	1,875·4	.....	.....

x Production of two birds. d Dead.

APIARY

The winter of 1927-28 was quite mild, with very little snow. The advantage of mild weather was offset by the loss of protection usually derived from the snow.

The bees wintered fairly well in this district. The spring was cold and bees were not removed from cellar until April 26.

Fifty-two colonies were placed in winter quarters in the fall of 1927. Three died during the winter. One weak colony was united to another colony in the spring. One colony developed American Foul Brood and was destroyed. Three colonies were broken up into mating boxes. Two weak colonies were allowed the whole season in which to build up and produced no crop. Forty-two colonies, spring count, produced 2,587 pounds honey and two new colonies. This is an average or 58·8 pounds per colony, as compared with 44·3 pounds in 1927, 40·3 pounds in 1926, and 25 pounds in 1925. The highest producing colony yielded 118 pounds.

Out-apiaries were conducted at Springhill and Burton.

Fifty-three colonies were placed in winter quarters in the fall of 1928. Two were stored in a cellar, the balance being packed out-of-doors. Twenty of these are in the out-apiary at Burton and eight are in the out-apiary at Springhill.

CONTROL OF SWARMING BY DEQUEENING AND REQUEENING

Fourteen colonies that showed preparation for swarming, by having larvae in queen cells, were dequeened and at the same time all queen cells were destroyed. Nine or ten days later the queen cells were again destroyed and a young laying queen was introduced. Only one of the colonies thus treated made further preparation for swarming.

CONTROL OF SWARMING BY SEPARATION OF QUEEN AND BROOD

Twelve colonies that showed preparation for swarming by having larvae in queen cells were treated by separating the queen and brood. All combs containing brood were taken from the brood chamber and replaced by empty combs. The queen and the bees shaken from one frame were left in the brood chamber. The combs containing brood were put in an empty super, which was placed above a honey super. This super was separated from the honey super by a queen excluder, and the honey super was separated from the brood chamber by a queen excluder.

Three of the colonies, thus treated, made no further preparation for swarming. The remaining nine colonies made further preparation for swarming.

This is the fourth year that these experiments on swarm control have been carried on. In each year the best swarm control has been obtained by dequeening and requeening. These experiments have been carried on in the out-apiaries, as well as at the Station apiary and consequently it has not been possible to obtain any positive data on the effect of the different methods of management upon the honey crop. From data obtained, the indications are that the honey crop is practically the same from each manipulation.

METHOD FOR DETECTING PREPARATION FOR SWARMING

Experiments have been carried on for four years to determine the value of a double brood chamber for swarm detection. When colonies in ten-frame Langstroth hives show signs of congestion in the spring, the brood chamber has been enlarged by adding a shallow super filled with drawn comb. Thereafter, when these colonies were examined at regular intervals of nine or ten days, this shallow super has been tipped from the rear in order to determine whether preparation for swarming could be detected by the presence of cells built along the lower edge of the comb in the shallow super. In 1928, twenty-eight colonies with this double brood chamber made preparation for swarming and in all of these the queen cells were observable when tipping the shallow super. Similar results were obtained in 1925, 1926 and 1927.

WINTERING IN CELLAR

Twelve colonies were placed in a house cellar on November 22. Three of these were double colonies and one was an eight-frame Langstroth hive. The part of the cellar in which the bees were wintered was separated from the main cellar by partitions so that a lower and more even temperature could be maintained. The cellar temperature ranged from thirty-seven to fifty degrees and the cellar was rather damp. The bees were removed from the cellar on April 26. The results are shown in table 36.

TABLE 36.—WINTERING IN CELLAR

—	10-frame Langstroth	8-frame Langstroth
Number of colonies placed in cellar	11	1
Condition	Good	Good
Average strength, fall 1927 ..frames bees	8·45	6·0
Average strength, spring 1928 ..frames bees	4·0	4·0
Average weight, fall 1927 ..lb.	64·9	60·0
Average weight, spring 1928 ..lb.	42·6	40·0
Average stores consumed ..lb.	22·3	20·0
Number of colonies died	1	0
Number of colonies weak and united to other colonies	1	0
Number of colonies covering 6 frames in spring	1	0
Number of colonies covering 5 frames in spring	2	0
Number of colonies covering 4 frames in spring	5	1
Number of colonies covering 3 frames in spring	0	0
Number of colonies covering 2 frames in spring	2	0
Number of colonies covering 1 frame in spring	0	0
Number of colonies covering ½ frame in spring	0	0

WINTERING IN FOUR-COLONY CASES

Twelve colonies were wintered in four-colony packing cases at this Station and twelve colonies were similarly wintered in the out-apiary at Burton. Colonies were placed in packing cases before being fed for winter; feeding was done on September 28 and October 8. Buckwheat hulls were used for insulation. Five inches of packing was used on the bottom and sides, and six inches on the top. The top packing was enclosed in sacks. The results are shown in table 37.

TABLE 37.—WINTERING IN FOUR-COLONY CASES

—	Fredericton	Burton apiary	
	10 frame	10 frame Langstroth	10 frame Jumbo
Number of colonies wintered in four-colony cases	12	8	4
Condition	Good	Good	Good
Average strength, fall 1927 ..frames bees	9·16	9·12	8·0
Average strength, spring 1928 ..frames bees	4·0	4·25	3·0
Average weight, fall 1927 ..lb.	75·16	75·0	77·0
Average weight, spring 1928 ..lb.	44·58	45·5	44·0
Average stores consumed ..lb.	30·58	29·5	33·0
Number of colonies died	0	0	1
Number of colonies weak and united to other colonies	0	0	0
Number of colonies covering 8 frames in spring	0	0	0
Number of colonies covering 7 frames in spring	1	2	0
Number of colonies covering 6 frames in spring	1	0	0
Number of colonies covering 5 frames in spring	3	0	0
Number of colonies covering 4 frames in spring	4	4	0
Number of colonies covering 3 frames in spring	0	1	3
Number of colonies covering 2 frames in spring	1	0	0
Number of colonies covering 1 frame in spring	2	1	0

WINTERING IN TWO-COLONY CASES

Six colonies were packed in two-colony cases at this Station and eight colonies at Burton. Colonies were placed in the packing cases before being fed, namely, September 28 and October 8. The packing used was the same as in the four-colony cases. The results are shown in table 38.

TABLE 38.—WINTERING IN TWO-COLONY CASES

	Fredericton apiary	Burton apiary	
	10-frame Langstroth	10-frame Langstroth	10-frame Jumbo
Number of colonies wintered in two-colony cases	6	4	4
Condition	Good	Good	Good
Average strength, fall 1927 ..frames bees	9·5	10·0	7·25
Average strength, spring 1928 ..frames bees	5·5	5·25	3·66
Average weight, fall 1927 ..lb.	74·5	74·25	84·33
Average weight, spring 1928 ..lb.	45·83	47·25	48·66
Average stores consumed ..lb.	28·67	27·0	35·66
Number of colonies died	0	0	1
Number of colonies weak and united to other colonies	0	0	1
Number of colonies covering 8 frames in spring	0	0	0
Number of colonies covering 7 frames in spring	1	0	0
Number of colonies covering 6 frames in spring	2	2	0
Number of colonies covering 5 frames in spring	2	1	0
Number of colonies covering 4 frames in spring	1	1	2
Number of colonies covering 3 frames in spring	0	0	1
Number of colonies covering 2 frames in spring	0	0	0

WINTERING IN SINGLE-COLONY CASES

Two colonies were packed in single-colony cases with four inches of packing on the bottom and sides and six inches on the top. Buckwheat hulls were used for packing. The results are shown in table 39.

TABLE 39.—WINTERING IN SINGLE COLONY CASES

	Fredericton apiary
Number of colonies packed in single cases	2
Condition	Good
Average strength, fall 1927 ..frames bees	10·0
Average strength, spring 1928 ..frames bees	6·0
Average weight, fall 1927 ..lb.	75·0
Average weight, spring 1928 ..lb.	44·0
Average stores consumed ..lb.	31·0
Number of colonies died	0
Number of colonies covering 6 frames in spring	2

Both colonies came out in good condition in the spring with six frames of bees. These colonies were left in the case all summer, the cover being raised as necessary when supers were added.

A comparison of the results from wintering bees in the cellar and in different types of packing cases shows:—

Colonies wintered in packing cases consumed a little more stores than colonies wintered in the cellar.

Colonies wintered in packing cases were stronger in the spring than colonies kept in the cellar.

A comparison of the results from wintering in four-colony and two-colony cases shows the highest spring count from wintering in four-colony cases. Hives wintered in two-colony cases were stronger in the spring. The results from the two-colony cases were not as satisfactory at Burton as at Fredericton.

The spring count, not counting weak colonies united to other colonies, estimated as percentage of the fall count for colonies wintered in different ways, is shown in table 40. The 1926 and 1927 records are shown in the same table 40.

TABLE 40.—RESULTS OF DIFFERENT METHODS OF WINTERING

—	Per cent 1926	Per cent 1927	Per cent 1928
Wintered in cellar	77·27	55·55	83·33
Wintered in four-colony cases	79·16	95·83	95·83
Wintered in two-colony cases	71·42	71·42	85·71
Wintered in one-colony cases	100·0	50·0	100·0

As only two colonies have been wintered in single cases each year, conclusions should not be drawn from the results when wintered in single cases.

TWO-QUEEN SYSTEM

This experiment is carried on in order to determine a satisfactory method of wintering over a number of surplus queens. Six weak colonies were selected in the fall of 1927 for the experiment. Five of the lightest combs were removed from each colony and the bees shaken back into the hive. The remaining five combs were placed to one side of the hive. The following day, a tight division board was placed in three of the colonies, and the bees and brood and queens from the three remaining colonies were placed one in each of the divided hives. Two weak colonies with queens were thus brought together in one hive. Separate entrances were provided at the corner of the hives and an oilcloth cover was tacked to the division board beneath the cover and over the frames. These colonies were wintered in the cellar. In each hive the two queens lived, one of which was available to save a queenless colony in the spring.

COMPARISON OF DIFFERENT SIZES OF HIVES

An experiment was carried on in the out-apiary at Burton to compare the ten-frame Langstroth and ten-frame Jumbo hives. As soon as the bees in the ten-frame Langstroth hives required additional room in the spring of the year, a shallow super was added. The results are shown in table 41.

TABLE 41.—COMPARISON OF DIFFERENT SIZES OF HIVES

1927–1928	Burton outdoors	
	Ten-frame Langstroth	Ten-frame Jumbo
Number of colonies	12	8
Average strength for winter, fall 1927 ..frames bees	9·41	7·62
Average stores consumed 1927-28 ..lb.	28·66	34·33
Average spring strength 1928 ..frames bees	4·58	3·33
Average strength, June 27 ..frames bees	3·25	7·83
Average rapidity of increase	8·67	4·5
Per cent colonies prepared to swarm	83·33	50·0
*Average crop produced ..lb.	83·72	46·0
Number of colonies died	0	2
Number of colonies weak and united	0	0

*Not including one colony in each group which produced no crop.

PACKAGE BEES AS A MEANS OF STARTING COLONIES

Three two-pound packages of bees, with queens, were purchased on two different dates, namely May 6 and May 17. These were obtained from J. M. Cutts & Sons, Montgomery, Alabama. They were placed in the out-paiary at Springhill, along with six over-wintered colonies, one-half of which had been wintered in packing cases and the remainder in the cellar. Results are shown in tables 42 and 43.

TABLE 42.—PACKAGE BEES AS A MEANS OF STARTING COLONIES

Date received	Source	Number of colonies	Average strength June 20	Condition for honey flow	Average crop	Average strength for winter
			fr. bees		lb.	fr. bees
May 6	J. M. Cutts & Sons	3	7·66	Fairly good	26·66	8·33
May 17	J. M. Cutts & Sons	3	5·0	Fair	13·66	9·0

TABLE 43.—RESULTS FROM OVER-WINTERED COLONIES

Type of colony	How wintered	Number of colonies	Average strength June 20	Condition for honey flow	Average crop	Average strength for winter
			fr. bees		lb.	fr. bees
10-frame Langstroth	Packing cases	3	14·00	Good	*20·0	9·33
10-frame Langstroth	Cellar	3	9·33	Fair	58·33	9·33

*Two colonies produced 9 and 6 pounds respectively.

Experiments have been carried on with package bees for four years. These have been received at different dates in order to obtain information as to the date that these should be established in order to obtain a honey crop. During two years, package bees received the last of April or the first of May produced crops fairly comparable with those secured from over-wintered colonies. The results this year were in favour of over-wintered colonies and the last shipment only produced half as much honey as the first one. The four years' experience indicate that package bees should be established not later than the first of May.

OUTDOOR VERSUS CELLAR WINTERING

The results of wintering in cellar and in packing cases are shown in part, in previous tables. A summary of the results, including the honey production, is shown in table 44.

TABLE 44.—WINTERING IN CELLAR VERSUS IN PACKING CASES OUTDOORS

Locality of apiary	Type of hive	Where wintered	Number of colonies		Average strength fall 1927	Average strength spring 1928	Average strength June 23 and 27	Average stores fed, fall 1927
			Placed in winter quarters	Spring count 1928				
					fr. bees	fr. bees	fr. bees	lb.
Fredericton	10-frame Langstroth	Cellar	8	6	8·37	3·85	10·0	22·87
Fredericton	10-frame Langstroth	Packing cases.	17	17	9·29	4·58	14·21	30·82
Springhill	10-frame Langstroth	Cellar	3	3	8·0	4·0	12·0	25·0
Springhill	10-frame Langstroth	Packing cases.	3	3	9·66	4·33	16·66	31·0

Locality of apiary	Type of hive	Where wintered	Average weight fall, 1927	Average weight spring 1928	Stores consumed	Number of colonies prepared to swarm	Average crop, all colonies	Number of colonies produced crop	Average crop from producing colonies
			lb.	lb.	lb.		lb.		lb.
Fredericton	10-frame Langstroth	Cellar	65·0	42·83	22·16	5	44·8	5	44·8
Fredericton	10-frame Langstroth	Packing cases.	74·94	45·41	29·52	12	65·4*	14	64·4
Springhill	10-frame Langstroth	Cellar	63·33	41·33	22·0	2	58·33	3	58·33
Springhill	10-frame Langstroth	Packing cases.	75·0	42·0	33·0	3	20·0	3	20·0

*One colony used for mating box produced 26 lbs. of honey. This was not counted in the crop.

QUEEN REARING

Two methods of queen rearing were tested.

(1) On June 15, a frame of foundation cut into three triangular pieces, which projected down to about two-thirds the depth of the frame, was placed in the centre of colony No. 83. On July 5, the foundation had been drawn out and contained plenty of eggs and young larvae. The comb was cut as far back as day-old larvæ. This frame was then placed in the top super of colony No. 187, which had been made queenless and broodless to encourage them to draw out cells. On July 9, eighteen cells had been drawn out. Nine of these were selected and placed in mating boxes. Eight of these hatched.

(2) A frame containing a full sheet of foundation was placed in colony No. 149 on July 5. On July 21, this was drawn out and filled with eggs and larvae. Every second and third cell lengthwise and crosswise on one side was then destroyed. This frame was then placed on its flat, prepared side downward, over the brood chamber of a queenless colony, viz., No. 134. On July 31, nineteen cells were drawn out. Ten were transferred to a mating box as in (1). Nine queens hatched from these cells.

These methods of queen rearing have been tested for five years. During two seasons, similar results have been obtained from the two methods. In two other seasons, the latter method gave a little better results.

EXTENSION WORK

A special effort was made during the year to acquaint farmers and the public generally with the work at the Station. Special Field Days were held and were well attended. Exhibits were featured at several of the leading exhibitions, the Station staff delivered addresses at farmers' meetings, articles were prepared for the press, and successful field meetings were held at a number of Illustration Stations in the Province.

The number of visitors to the Station showed a decided increase over previous years. This was due in a large measure to the improvement of our highways and the more general use of motor cars. The correspondence with farmers was also much greater than formerly.

Radio broadcasting through C.F.N.B. was tried out as a means of disseminating agricultural information. While the inquiries resulting from these

addresses delivered over the air have not been numerous, quite a number of farmers have made favourable comments on our programs and in a few cases we have sold live stock to farmers following announcements over the air. As radio sets become more generally used by farmers, broadcasting should become a very effective method of interesting farmers in the work of the Station.

The farmers of Enniskillen and Petersville district made their third annual visit to this Station. This group of farmers was accompanied by their parish priest, Father Allen, who has done much to improve agriculture in that district and follows the work of this Station very closely.

A large party of farmers and business men from the Sussex district, under the auspices of the local Agricultural Society, made their first visit to this Station. An inspection was made of the work in the field and stable, and a great deal of interest was shown by these visitors. The farmers of this district plan to make a visit to this Station annually in future.

The St. Stephen-Milltown Rotary Club continues to take a special interest in this Station and in the agricultural prosperity of Charlotte county. Last year this club brought over eighty farmers to this Station by motor; this year they arrived with over one hundred and twenty. The Rotarians accompanied their farmer friends over the farm and all seemed to appreciate the efforts put forth by the staff to entertain and instruct them. The club plans to bring one hundred farmers' wives to the Station next year.

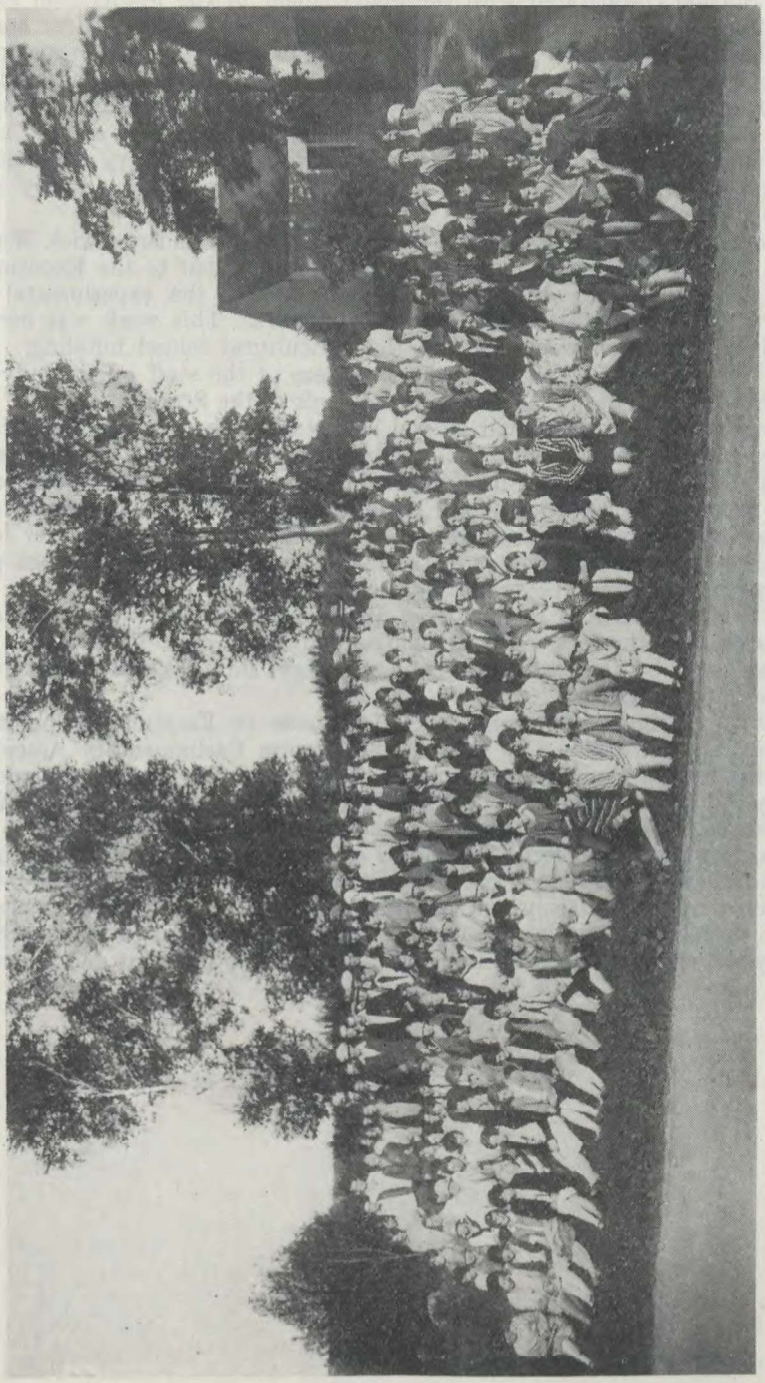
The Fredericton Rotary Club also takes a special interest in agriculture and held its fourth annual Farmers' Day at this Station.

Field Days, as in former years, took a prominent place in the extension program of this Station. The seventh annual Poultry Field Day was attended by over one hundred and twenty-five poultrymen and their friends. Judging contests and demonstrations were conducted, and addresses were delivered by members of the federal and provincial Departments of Agriculture. The New Brunswick Poultry Producers' Association held its annual meeting and the New Brunswick Registered Poultry Breeders' Association was organized during the day. The former association was organized at a Poultry Field Day a few years ago and has been of great assistance to the poultrymen of the province. The latter association is confined to poultrymen owning registered birds, having taken part in one or more of the provincial egg laying contests. This association will be engaged largely in the popularizing of registered poultry and incidentally finding a profitable market for day-old chicks, hatching eggs and cockerels produced by breeders of this class of stock.

The Fruit Growers held their annual Field Day under the auspices of the New Brunswick Fruit Growers' Association. This meeting took the form of a tour of the orchards in the Fredericton district, including the Experimental Station, where lunch was served at the noon hour. The fruit growers were especially interested in the promising new varieties of apples, in an experiment to determine the effect of heavy applications of nitrate of soda, and in the work under way to secure a hardy winter variety of apple suitable for New Brunswick conditions.

Mr. R. W. Maxwell, principal of the Vocational School, Woodstock, visited this Station in company with a group of farm boys from Carleton county. All these boys had taken the agricultural course at the Vocational School at Woodstock. These boys showed a special interest in live stock and mixed farming and the day was devoted to judging demonstrations and discussions relating to improvement of field crops and methods of soil cultivation.

The Normal School students of Fredericton made their seventh annual visit to the Station. More than three hundred were present. They were divided into groups and given instruction in regard to the work of this Station by members of the staff.



The seventh annual visit of Normal School students (prospective rural school teachers) to the Fredericton Experimental Station.

This Station co-operated with the management of the Fredericton Exhibition in entertaining the live stock exhibitors. The live stock breeders and officials of the Exhibition met at this Station late in the afternoon, inspected the live stock and field experimental work at the Station. This was followed by a dinner served in the agricultural school building presided over by the superintendent. A number of very interesting and instructive addresses, dealing mainly with live stock, were delivered, and there was evidence on every hand of good feeling and a desire to advance the interest of the live stock industry in the Maritime Provinces.

The delegates attending the annual meeting of the New Brunswick Women's Institute, held in Fredericton, paid their third annual visit to the Experimental Station. These visitors were especially interested in the experimental work relating to poultry, fruit, vegetables and flowers. This work was carefully explained and luncheon was served in the agricultural school building. These annual visits are looked forward to by members of the staff as the lady delegates always show a decided interest in the work of the Station.

During the year we also had several important gatherings at the Station of a more or less national or empire character. The Canadian Forestry Association held its annual meeting in Fredericton this year and an invitation was extended to the delegates to visit the Experimental Station. A pleasant feature of this gathering was a luncheon served to the delegates, presided over by one of the assistants to the superintendent, who outlined the more important phases of the experimental work being carried on at the Station.

The Station also had a visit from thirty English girls who were touring Canada under the auspices of the Daughters of the Empire. These young ladies were entertained by the staff and given an insight into the work carried on in the interests of agriculture.

Possibly the most important delegation, from an Empire standpoint, ever entertained at the Station was that of the Empire Parliamentary Association. These delegates represented a great many countries within the Empire and were very ably led by the Right Hon. Viscount Peel, First Commissioner of Works, Great Britain. The superintendent presided over a luncheon given to these delegates, to which were invited members of the federal and provincial governments and citizens of Fredericton. The delegates delivered some very interesting addresses, dealing mainly with agriculture in their respective countries, and showed a decided interest in much of the work being carried on at this Station, especially the work dealing with live stock, pasture improvement and orcharding.

OTTAWA: Printed by F. A. ACLAND, Printer to the King's Most Excellent Majesty, 1929.