DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
DOMINION EXPERIMENTAL FARMS

EXPERIMENTAL STATION

CHARLOTTETOWN, P.E.I.

REPORT OF THE SUPERINTENDENT

J. A. CLARK, B.S.A.

FOR THE YEAR 1923

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EXPERIMENTAL STATION, CHARLOTTETOWN, P.E.I.

REPORT OF THE SUPERINTENDENT, J. A. CLARK, B.S.A.

FOR THE YEAR 1923

SEASONAL NOTES

The early autumn of 1922 was favourable for fall work. A killing frost occurred on October 19, and the first snow fell on that date. Snow fell on November 16, 17, 22, 23 and 28. Winter set in very early, and the snow that fell on November 22 remained until spring. December was cold and stormy; in January the temperature fell to 23° F. below zero, the coldest recorded at this Station. To the 40 inches of December snow, January added 42 inches. February was fine, cold and bright. March was stormy and cold, adding 47 inches to the winter's snow. The snow rapidly melted and soaked into the unfrozen ground during April. The 1923 planting was late. The month of May was backward, and work on the land commenced about May 15, with seeding general from May 18. Trees did not appear green until June 4; a full week later than average.

Grain germinated well and grew strong during the cool favourable weather of June and July. The grass and clover wintered well and matured slowly, producing a heavy crop that was practically all cut in August. All crops matured slowly. There was good harvest weather and abundant crops were safely harvested. Small fruits were light, and large fruits gave poor yields, owing to the cool, backward season. The pastures were good throughout the entire season, and the grass continued to grow so late that the lawns were cut for the last time early in December. A very heavy gale occurred on the first of October, destroying many trees and injuring the late grain uncut at that time. November and December were unusually mild and fine. The mean temperature for November, 40·6, was the highest yet recorded at this Station. December, 32·218 was six degrees above the average mean.

METEOROLOGICAL RECORDS, 1923

Month	Temperature (Fahrenheit)					Precipitation					Bright Sunshine Hours
	Maximum		Minimum		Mean	Rainfall		Snowfall		Total	
	Date	Deg.	Date	Deg.	Days	Days	Inches	Days	Inches	Inches	
1923											
January	1	44·0	18	−23	14·532	5	0·57	10	40·0	4·57	72·7
February	9	35·0	5	−15	6·660	.....	.....	3	5·50	0·55	166·1
March	20	46·5	15	−15	19·282	2	0·21	14	47·25	4·93	137·3
April	21 & 22	54·0	2	5	34·383	8	1·63	6	6·68	2·29	129·5
May	9	72·0	4	32	46·41	12	2·91	.....	.....	2·91	182·0
June	20	83·0	16	35	56·765	9	3·63	.....	.....	3·63	217·7
July	18	83·0	9	41	63·064	11	2·09	.....	.....	2·09	219·9
August	3	80·0	17	41	61·951	8	2·23	.....	.....	2·23	255·4
September	3 & 4	74·0	27	35	56·933	8	4·61	.....	.....	4·61	189·6
October	19	70·0	28	30	50·548	11	5·3	.....	.....	5·3	157·3
November	7 & 8	60·0	20	19	40·616	10	3·34	1	0·75	3·41	73·2
December	7 & 14	53·0	31	8·5	32·218	4	1·51	10	28·55	4·36	45·8
Totals	.....	.....	.....	.....	.....	88	28·03	44	128·73	40·88	1,846·5
Average for 15 years	.....	.....	.....	.....	.....	.....	30·51	.....	107·75	39·72	1,851·9

84596—1½

ANIMAL HUSBANDRY

HORSES

There was no change in the number of draught horses at the Station during the year; these consist of four pure-bred Clydesdale mares, one gelding and one grade mare. There is also an express gelding and a driving mare.

The horses have been in good health, the total number of hours of work performed by the eight horses was 18,254. The average number of working days per horse was 228, or about 75 per cent of the working days in the year.

The Moline Model D Tractor relieved the horses of much of the heavy work during the busy seasons and in the hot weather when the flies were most annoying.

When at hard work during planting, horses weighing about 1,500 pounds received 15 pounds hay and 18 pounds crushed oats per day. From the first of August, 2 pounds of bran were substituted for 2 pounds of the oats. After the heavy work in the autumn was over, the ration for horses was further reduced by substituting more bran for oats.

DIVISION OF HORSE LABOUR

Farm work	12,025 hours
Hauling manure	2,856 "
Express and driving	1,715 "
Horticultural division and lawns	766 "
Cultural area work	480 "
Road work	412 "
	18,254 "

The average yearly feed requirements per horse has been as follows:—

Hay	5,404 pounds
Oats	5,291·25 "
Bran	710 "

The following is an analysis of maintenance costs of the 8 horses:—

Feed—Hay, 21 tons, 330 pounds at $10		$ 211 65	
Oats, 1,271 bushels, 17 pounds at 50 cents		635 75	
Bran, 2 tons, 1,679 pounds at $33		93 70	
		$ 941 10	= 50·3%
Labour, 1,186 hours at 36 cents per hour		426 96	= 22·8%
Interest (6% on $1,500)		90 00	= 4·8%
Shelter (estimated at $25 per horse)		200 00	= 10·7%
Harness repairs, etc.		82 75	= 4·4%
Miscellaneous—Shoeing	$ 110 90		
Veterinary and drugs	18 25		
		129 15	= 6·9%
Total yearly cost		$ 1,869 96	
Hours horse labour, 1,825 at 12 cents			$ 2,190 48
Balance		320 52	
		$ 2,190 48	$ 2,190 48
Average annual value of horse labour		$ 273 81	
Annual average cost per horse		233 75	
		$ 40 06	

DAIRY CATTLE

The Ayrshire herd at this Station continues to show marked improvement in both type and production. There were at the close of the year: one aged bull, "Ravenwood Victor" No. 72902; 7 milk cows, including 3 two-year-old

heifers; 8 young heifers; 1 junior bull "Ottawa Lord Kyle 8th"—81916—secured from the Central Experimental Farm at the 1923 "Royal" at Toronto, Ont., where he was Junior Champion; 2 bull calves—a total of 20 head.

This herd was fully accredited August 9, 1922 (Certificate Number 219), passed all tests and had the certificate made valid for one year from August 1, 1923.

The herd was shown at Charlottetown, P.E.I., where it won many good placings, including First and Senior Championship for aged bull, and first for mature cow in milk. Ten head were shown at the 1923 "Royal", and among a number of good placings, two second prizes in the production classes were won.

The following is a list of cows completing Record of Performance in 1923, together with amount of production:—

RECORDS OF PERFORMANCE

Name and Number	Age at freshening	Days in period	Milk	Butter fat	Average test
	years	lb.	lb.	lb.	p.c.
Buttercup of Glenholm—56491	6	345	14,637	527	3·60
Daisy of Sunny Slope—72581	2	365	12,566	457	3·64
Lily of Melrose—30634	14	268	10,455	399	3·82
Ravenwood Milkmaid—73374	2	343	9,987	387	3·88
Ravenwood Victoria—66314	4	303	9,518	430	4·52

Daisy of Sunny Slope was milked for 442 days in her 2-year-old or first lactation period, giving 14,135 pounds milk and 514 pounds butter fat.

Charges for feed include the period in which the cows were dry prior to the lactation period, and during the period herein reported. The records for heifers with their first calves include all feed consumed from a date two months prior to and during the full lactation period mentioned.

In estimating costs, the following values were used:—

Pasture per month, per cow	$ 1 50
Meal mixture, per ton	34 20
Hay	10 00
Roots	2 00
Silage	4 00
Green feed	4 00

These values represent actual cost price of material bought or sold. The products raised on the farm are charged, as nearly as possible, at the average prices at which similar products were bought and sold in the neighbourhood during the period.

In calculating the value of products, actual cash value was used, amounting to 38 cents per pound for butter and 30 cents per 100 pounds for skim-milk.

Labour is not included in the cost; on the other hand, the value of the manure made, and the value of the calf at birth should more than counterbalance this.

Name, and Date of Dropping Calf	Number of days in milk	Total pounds of milk in period	Daily average of milk	Average per cent of fat	Pounds of 80 per cent butter produced in period	Value of butter at 38 cents per pound	Value of skim milk at 30 cents per cwt.	Total value of product	Amount of meal eaten at $1.71 per cwt.	Amount of roots eaten at $2 per ton	Amount of hay eaten at $10 per ton	Amount of silage and green feed at $4 per ton	Months on pasture at $1.50 per month	Total cost of feed between calvings	Cost to produce 100 pounds milk	Cost to produce one pound butter, skim milk neglected	Profit on one pound butter, skim milk neglected	Value of calf when born	Profit on cow during period, labour and value of calf neglected
		lb.	lb.	p.c.	lb.	$ c.	$ c.	$ c.	lb.	lb.	lb.	lb.		$ c.	$ c.	cts.	cts.	$ c.	$ c.
"Buttercup of Glenholm"—56491—Sept. 12, 1922	345	14,637	42·4	3·6	658·75	250 32	42 33	292 65	5,633	8,310	2,794	4,060	6½	137 77	0 94	20·9	17·1	50 00	154 88
"Ravenwood Milkmaid"—73374—Nov. 22, 1922	343	9,987	29·1	3·88	483·75	183 82	28 80	212 62	5,378	7,415	2,810	4,740	4½	143 51	1 43	29·6	8·4	20 00	69 11
"Daisy of Sunny Slope"—72581—Dec. 14, 1922	422	14,135	31·9	3·64	642·5	244 15	40 86	285 01	6,526	16,620	4,522	5,960	3½	167 88	1 18	26·1	11·9	20 00	117 13
"Ravenwood Victoria"—66314—Mar. 26, 1923	303	9,518	31·4	4·52	537·5	204 25	27 26	231 51	4,822	10,345	3,299	5,838	2½	124 71	1 31	23·2	14·8	10 00	106 80
"Lily of Melrose"—30634 Mar. 21, 1923	268	10,455	39·0	3·82	498·75	189 52	30 16	219 68	4,502	9,872	3,281	5,840	2½	118 69	1 13	23·8	14·2	25 00	100 99
Total 5 cows	1,701	58,732	173·8	19·46	2,821·25	1,072 06	169 41	1,241 47	26,861	52,562	16,706	26,438	19·5	692 56	5 99	123·6	66·4	125 00	548 91
Average	340	11,746	34·7	3·89	564·25	214 41	33 88	248 29	5,372	10,512	3,341	5,287	3·9	138 51	1 20	24·7	13·3	25 00	109 78

CUMULATIVE RECORD

"Buttercup of Glenholm"—56491—in four Record of Performance tests has made the following cumulative record:—

Name	Age at commencement of tests	Number R.O.P. test	Number of days in test	Pounds of milk	Pounds of fat	Pounds of 80% butter
	Yr. Mos. Dys.					
Buttercup of Glenholm—56491—	2 11 23	1547	357	9,192	351	438¾
	4 1 18	1914	365	16,444	662	827½
	5 4 2	2126	326	14,273	585	731¼
	6 5 17	2325	345	14,637	527	658¾
Totals				54,546	2,125	2,656¼

STEER FEEDING

METHODS OF FEEDING

The experiment commenced in 1920, with different methods of feeding steers repeated in 1921, was continued with duplicate pens during the winter of 1922-1923. The details in connection with the plan of this experiment were published in the 1922 report of this Station.

Briefly stated they were:—

I. The usual method followed on the average farm was followed. The hay was fed loose, the turnips round and the meal fed at a separate time from the others.

II. The turnips were pulped and the hay run through a cutting box. The grain, roots and hay were fed separately.

III. The turnips were pulped, the hay chopped, and then both were mixed with the grain before being fed.

IV. The turnips were pulped, the hay chopped, both were mixed with the grain and thoroughly moistened before feeding.

The following statement gives the total, and averages for the four times this experiment has been repeated. It covers periods when both the cost of cattle and feeds were high, during the sudden change in the value of both, and when both were comparatively low:—

COMPARISON OF FOUR METHODS OF FEEDING

Method		No. I	No. II	No. III	No. IV
Number of steers in group		16	16	16	16
First weight of group	lb.	14,435	14,420	14,740	14,720
First average weight	"	902	901	921	920
Finished weight of group	"	18,280	18,430	18,300	18,300
Total gain	"	3,845	4,010	3,560	3,580
Average gain per steer	"	240	250¼	222½	223¾
Gross cost of feed	$	572 13	572 13	572 13	572 13
Cost of 1 pound gain	cts.	14·8	14·2	16·0	15·1
Value of cattle at start	$	988 76	995 39	993 04	1,028 81
Cost to produce beef	$	1,560 89	1,567 52	1,565 17	1,600 94
Value when sold	$	1,597 04	1,642 69	1,546 10	1,571 99
Profit or loss	$	36 15	75 17	−19 07	−28 95
Profit or loss per steer	$	2 26	4 70	−1 19	−1 81
Average valuation start	$	61 80	62 21	62 06	64 30
Average sale value	$	99 81	102 66	96 63	98 24
Average increase in value	$	38 01	40 45	34 56	33 94
Average cost of feed per steer	$	35 75	35 75	35 75	35 75

84596—2½

Feeding Method No. II has produced the highest gains, the lowest cost per pound gain and the greatest profit per steer. Feeding Method No. I was second and has the advantage of requiring less labour, since the roots were not pulped or the hay chopped. Feeding Method No. III requires less labour than No. IV, and though the actual feeding was performed more quickly than with any other method, yet the time required in preparation offset that advantage when compared with either No. II or No. I.

The high value of feeds during part of the period mentioned above and the slump in value of beef caused a loss per steer over the cost of feed with both methods No. III and No. IV.

In fattening steers it does not pay to expend much time on chopping hay and mixing it with other feeds. The slicing or pulping of turnips is recommended for young stock that are losing their first teeth and for old cows with worn teeth.

DEHORNING STEERS

In connection with the duplicate pens of steers in the 1922 experiment "Methods of Feeding"; one group, taking in the whole four pens mentioned, were either polled when purchased or dehorned. The second group, the other four duplicate pens mentioned, were horned cattle tied in stalls. In the first group one pen of polled steers and one pen of dehorned steers were tied in stalls and two pens were dehorned and allowed to run loose in box stalls.

Comparing dehorned steers tied with horned steers tied, the pen of horned steers tied gained 15 pounds more than the corresponding pen of polled steers; on the other hand, the pen of dehorned steers tied gained 15 pounds more than the corresponding pen of horned steers tied. So far, then, as feeding steers in stalls is concerned, the advantage of dehorning would appear greatest when marketing. The absence of goring and bruising when driving and shipping to market is well worth all the trouble taken in removing the horns.

Comparing horned steers tied with dehorned steers fed loose in box stalls, both of the pens of dehorned steers when fed in box stalls made greater gains than the corresponding pens of horned steers that were tied in stalls. The average gain in favour of the dehorned steers was 40 pounds per pen in the 111 days of the experiment.

When steers are dehorned they can be fed in a more cheaply constructed shed. They can be fed in less time. If given sufficient bedding, they will tramp down large quantities of waste material, seaweeds, etc. into the manure, making it both more valuable and a greater quantity than is secured when steers are tied in stalls.

Dehorned steers are more contented, feed better, and usually command a higher price.

SWINE

The demand for pure-bred Yorkshire pigs from six to eight weeks old was so great in the spring of 1923 that the entire spring litter at Charlottetown was sold to boys' clubs. At the close of the year we had one brood sow, "Ravenwood Girl 6th", and two autumn litters that were doing very well. Arrangements have been made to secure the sow "Ottawa Lass 387"—97020—from the Central Experimental Farm before she farrows. She was bred there to Dalmeny AR. (Imp.)—88840—and should be a valuable addition to the Yorkshire breed in P.E.I.

FIELD HUSBANDRY

DATES OF FARM OPERATIONS

The principal farm operations were begun, in 1923, on the following dates:—

Rolling meadows	May	1
Preparations for field crops	"	11
Seeding wheat	"	14
Seeding oats	"	14
Seeding barley	"	14
Seeding clover and grasses	"	14
Seeding potatoes	"	25
Seeding mangels	"	28
Seeding turnips	June	7
*Seeding corn	"	20
*Seeding sunflowers	"	20
Seeding buckwheat	July	7
Cultivating hoed crop	June	22
Spraying orchard	July	5
Spraying potatoes	"	13
Cutting clover	"	23
Cutting timothy	Aug.	3
Summer ploughing of sod	"	25
Cutting barley	"	27
Cutting oats	Sept.	6
Cutting wheat	"	11
Threshing	"	26
Cutting corn	"	29
Harvesting potatoes	Oct.	12
Autumn ploughing of stubble	"	15
Harvesting mangels	"	18
Ploughing	"	25
Harvesting turnips	Nov.	7
"Freeze up"	"	12

*The seeding of corn and sunflowers was delayed ten days by drainage operations.

CROP ROTATIONS

Interest in systematic farm rotations is increasing from year to year. The rapid development of the seed potato industry has induced many to shorten their rotation, in order to grow more clover, which provides the cheapest and best source of increasing the available supply of nitrogen in the soil. Five of the experimental rotations started in 1912 were continued. They are used for demonstration and to supply reliable data on " cost of production " etc., of the various crops. The fixed values charged in connection with these rotations have been revised by the Dominion Field Husbandman after consulting with the Superintendents in charge of Experimental Stations in Eastern Canada. Those used in this report are as follows:—

Costs

Rent of land, per acre	$ 3 00
Manure (spread) per ton	1 00
Oats, per bushel	1 00
Barley, per bushel	1 50
Wheat, per bushel	2 00
Use of machinery, per acre	3 00
Manual labour, per hour	0 25
Horse labour	0 12
Grass seed	At cost
Twine	"
Seed, turnips, mangels, potatoes	"

Return Values

Oats, per bushel	$ 0 45
Barley, per bushel	0 75
Wheat, per bushel	1 00
Hay, per ton	12 00
Roots	0 05
Potatoes, certified seed, per bushel	1 12
Potatoes, culls from certified seed, bushel	0 40
Oat straw	4 00
Wheat straw	2 00

ROTATION "A" (FIVE YEARS' DURATION), SUITABLE FOR DAIRY FARMING

First year.—Hoed crop twenty-five tons of manure are used in preparation for this crop, usually one-half being applied on stubble the previous autumn, the balance in the spring, and worked in with the disk harrow. The first year crop is charged with 40 per cent of cost of manure, second year crop 25 per cent, third year crop 20 per cent, fourth year crop 10 per cent, and fifth year crop 5 per cent.

Second year.—Grain, seeded down with red clover 10 pounds, alsike 2 pounds and timothy 12 pounds per acre.

Third year.—Clover hay.

Fourth year.—Timothy or pasture, broken in August or early September; topworked during the balance of the season.

Fifth year.—Grain, seeded with 8 pounds of red clover, and 2 pounds of alsike for roots. The cost of clover seed sown for soiling crop is distributed in the same proportion as the cost of stable manure.

ROTATION "D" (FIVE YEARS' DURATION) FOR THE CONTROL OF DAISIES AND OTHER PERENNIAL WEEDS

First year.—Hoed crop, to receive 15 tons manure in spring.

Second year.—Grain, seeded down with 10 pounds red clover, 2 pounds alsike and 6 pounds timothy per acre.

Third year.—Clover hay, ploughed in autumn.

Fourth year.—Grain, seeded down with 10 pounds red clover, 2 pounds alsike and 12 pounds timothy per acre.

Fifth year.—Clover hay or pasture, top-dressed with 10 tons manure per acre in early autumn, and ploughed in preparation for hoed crop.

The cost of manure is charged against each crop in the same proportion as in rotation "A".

This rotation has been found to destroy many bad weeds.

ROTATION "C" (FOUR YEARS' DURATION)

This rotation is suitable for stock farming, as it produces relatively more hay and roots and less grain than the former ones. This is desirable when the farmer wishes to produce only sufficient grain for feeding purposes. The first year crop is charged with 40 per cent cost of manure, second crop 30 per cent, third year crop 20 per cent, and fourth year crop 10 per cent.

First year.—Hoed crop, receives 10 tons manure per acre in spring.

Second year.—Grain, seeded down with 10 pounds red clover, 2 pounds alsike and 12 pounds timothy per acre.

Third year.—Clover hay.

Fourth year.—Timothy hay or pasture. Ten tons of manure are applied early in autumn and ploughed under in preparation for roots.

ROTATION "F" (FOUR YEARS' DURATION)

This is a grain-growing rotation, especially suited to the production of large quantities of seed grain for sale.

First year.—Hoed crop, manured in spring at the rate of 12 tons per acre

Second year.—Grain, seeded down with 10 pounds red clover, 2 pounds alsike and 6 pounds timothy per acre.

Third year.—Clover hay, top-dressed in autumn with 8 tons manure per acre before ploughing.

Fourth year.—Grain, seeded down with 8 pounds red clover and 2 pounds alsike per acre.

ROTATION "G" (SEVEN YEARS' DURATION)

This is commonly called "Old P. E. Island Rotation."

First year.—Oats, seeded down with 8 pounds red clover and 2 pounds alsike per acre. The cost of clover seed sown for soiling crop is distributed in the same proportion as the cost of manure applied to the hoed crop.

Second year.—Hoed crop, manured in spring at the rate of 20 tons per acre. The cost of manure is charged in the following proportion: 40 per cent to first crop, 30 per cent to second crop, 20 per cent to third crop and 10 per cent to fourth crop.

Third year.—Grain, seeded down with 10 pounds red clover, 2 pounds alsike and 12 pounds timothy per acre.

Fourth year.—Clover hay.

Fifth year.—Timothy hay, top-dressed in August with 15 tons manure per acre. The cost of manure is charged as follows: 50 per cent to first crop following the application of manure, 30 per cent to second crop and 20 per cent to third crop.

Sixth year.—Timothy or pasture.

Seventh year.—Timothy or pasture.

SUMMARY OF YIELDS, VALUE AND PROFIT AND LOSS (PER ACRE)
Rotation A, five Years. —— Year 1923

Crop	Yields		Value	Cost of Production	Profit or Loss
	Average for 6 yrs.	1923			
	tons	tons	$	$	$
Mangels	19·79	22·75	45 50	85 49	−39 99
Oats (Banner)	bush 70·4	bush. 72·1	32 45	16 80	15 65
Hay (Clover)	tons 2·59	tons 2·59	31 08	17 22	13 86
Hay (Timothy)	tons 2·30	tons 2·00	24 00	14 72	9 28
Barley (Charlottetown No. 80)	bush. 45·7	bush. 42·2	31 65	17 46	14 19

SUMMARY OF YIELDS, VALUE AND PROFIT AND LOSS (PER ACRE)
Rotation B, five Years. —— Year 1923

Crop	Yields		Value	Cost of Production	Profit or Loss
	Average	1923			
Potatoes (Irish Cobbler)	4-year av. 216·6	bush. 259	$ 228 16	$ 77 92	$ 150 24
Wheat (Huron)	6-year av. 27·1	bush. 23·31	23 32	18 17	5 15
Hay (Clover)	tons 2·53	tons 2·79	33 48	18 66	14 82
Oats (Banner)	bush. 63·9	bush. 65·8	29 61	17 24	12 37
Hay (Clover)	tons 1·83	tons 1·9	22 80	15 78	7 02

SUMMARY OF YIELDS, VALUE AND PROFIT AND LOSS (PER ACRE)
Rotation C, four Years. —— Year 1923

Crop	Yields		Value	Cost of Production	Profit or Loss
	Average	1923			
	5-year av.	bush.	$	$	$
Potatoes (Irish Cobblers)	282·9	244	215 02	74 20	140 82
	6-year av.	bush.			
Wheat (Early Red Fife)	32·6	29·49	29 49	19 46	10 03
	tons	tons			
Hay (Clover)	3	2·894	34 73	16 11	18 62
Hay (Timothy)	2·93	3·175	38 10	13 69	24 41

SUMMARY OF YIELDS, VALUE AND PROFIT AND LOSS (PER ACRE)
Rotation G, Seven Years. —— Year 1923

Crop	Yields		Value	Cost of Production	Profit or Loss
	Average	1923			
	6-year av.				
	bush. lb.	bush.	$	$	$
Oats (O.A.C. No. 72)	60 21	83	37 35	20 56	16 79
	4-year av.	tons			
Turnips	17·7 ton	18·25	36 50	65 18	−28 68
	2-year av.				
	bush. lb.	bush.			
Wheat (Whiteheads)	31 37	33·5	33 50	22 20	11 30
	6-year av.				
	tons	tons			
Hay (Clover)	2·92	3·35	40 20	16 65	23 55
	tons	tons			
Hay (Timothy)	3·14	2·95	35 40	13 55	21 85
	tons	tons			
Hay (Timothy)	4	3·57	42 90	19 67	23 23
	tons	tons			
Hay (Timothy)	3·35	3·90	46 80	16 63	30 17

COST OF PRODUCTION OF FIELD CROPS

From the accurate records kept of all field operations on the experimental rotations, the following "Cost of Production" estimates have been compiled. The values used and the prices charged are those agreed upon by a conference of Superintendents with the Dominion Field Husbandman for use on the eastern Farms in the Experimental Farm system.

COST OF PRODUCING WHEAT AFTER HOED CROP
Figured based on one acre, Rotation B, for year 1923

Rent	$3 00
Share of manure	6 25
Use of machinery	3 00
Seed, 1½ bushels at $2	3 50
Twine, 3·4 lb. at 12½c	0 42
Ribbing, autumn 1922, man and 2 horses, 2 hours at 49c	0 98
Harrowing, spring, 1923, man and 2 horses, 3 hours at 49c	1 47
Rolling, spring 1923, man and 2 horses, ½ hour at 49c	0 16
Seeding, spring, 1923, man and 2 horses, ⅔ hour at 49c	0 33
Cutting, spring 1923, man and 3 horses, 1½ hours at 61c	0 76
Stooking, man, 1⅞ hours at 25c	0 44
Hauling, man and 2 horses, ⅔ hours at 49c	0 33
Raking, man and 1 horse, ½ hour at 37c	0 12
Threshing, man, 3½ hours at 25c	0 88
Manual labour, 1 hour at 25c	0 25
Total cost	$21 89

Yield of grain, 23 bushels, 19 pounds.
Yield of straw, 4,450 pounds.

Cost of producing 4,450 pounds straw	$3 72
" " 23 bushels 19 pounds grain	18 17
" " 1 bushel grain	78·9 cents

Cost of Producing Oats after Mangels

Figured based on 1 acre, Rotation A, for year 1923

Rent	$3 00
Share of manure and soiling crop	7 11
Use of machinery	3 00
Seed, 2¾ bushels at $1	2 75
Twine, 3·4 pounds at 12½c	0 42
Ribbing, autumn 1922, man and 2 horses, 2 hours at 49c	0 98
Harrowing, man and tractor, 1½ hours at 80c	1 20
Harrowing, man and 2 horses, 2 hours at 49c	0 98
Rolling, man and 2 horses, ⅓ hour at 49c	0 16
Seeding, man and 2 horses, ⅔ hour at 49c	0 33
Cutting, man and 2 horses, 1¼ hours at 49c	0 61
Stooking, 1½ hours at 25c	0 38
Hauling, man and 2 horses, 1 hour at 49c	0 49
Raking, man and 1 horse, ½ hour at 37c	0 12
Threshing, man, 4 hours at 25c	1 00
Manual labour, 1½ hours at 25c	0 38
Total cost	$22 91

Yield of grain, 72 bushels, 3 pounds.
Yield of straw, 5,210 pounds.

Cost of producing 5,210 pounds straw	$ 6 11
" " 72 bushels 3 pounds grain	16 80
" " 1 bushel grain	23·3 cents

Cost of Producing Barley after Hay

Figures based on one acre, Rotation A, for year 1923

Rent	$3 00
Share of manure and soiling crop	1 42
Use of machinery	3 00
Seed, 1¾ bushels at $1.50 per bushel	2 62
Twine, 3·1 pounds at 12½c	0 39
Autumn work, 1922—	
Ploughing, man and 2 horses, 5 hours at 49c	2 45
Rolling, man and 2 horses, ⅓ hour at 49c	0 16
Harrowing, man and 3 horses, 1⅓ hours at 61c	0 81
Harrowing, man and tractor, 1½ hours at 80c	1 20
Ribbing, man and 2 horses, 2 hours at 49c	0 98
Spring work—	
Harrowing, man and tractor, 1½ hours at 80c	1 20
Harrowing, man and 2 horses, 2 hours at 49c	0 98
Rolling, man and 2 horses, ⅓ hour at 49c	0 16
Seeding, man and 2 horses, ¾ hour at 49c	0 37
Cutting, man and 2 horses, 1¼ hours at 49c	0 61
Stooking, man, 1½ hours at 25c	0 38
Hauling, man and 2 horses, 1 hour at 49c	0 49
Raking, man and 1 horse, ½ hour at 37c	0 12
Threshing, 3½ hours at 25c	0 88
Manual labour, 2¾ hours at 25c	0 69
	$21 91

Yield of grain, 42 bushels 9 pounds.
Yield of straw, 4,000 pounds.

Cost of producing 4,000 pounds of straw	$ 4 45
" " 42 bushels 9 pounds grain	17 46
" " 1 bushel grain	41·4 cents

Cost of Producing Hay after Wheat

Figures based on 1 acre, Rotation C, for year 1923

Rent	$3 00
Share of manure	4 00
Use of machinery	3 00
Seed	2 48
Cutting, man and 2 horses, ·58 hour at 49c	0 28
Coiling, man, 6·14 hours at 25c	1 54
Raking, man and 1 horse, ·87 hour at 37c	0 32
Hauling, man and 2 horses, ·87 hour at 49c	0 43
Unloading, man and 1 horse, ·87 hours at 37c	0 32
Manual labour, 2·92 hours at 25c	0 73
Total cost	$16 11

Yield of hay, 2·89 tons.
Cost of producing 1 ton, $5.57.

Cost of Producing Mangels after Barley

Figures based on 1 acre, Rotation A, for year 1923

Rent	$ 3 00
Share of manure and soiling crop	11 20
Use of machinery	3 00
Seed, 9 pounds at 75c	6 75
Autumn work, 1922—	
Ploughing, man and 3 horses, 3 hours at 61c	1 83
Ribbing, man and 2 horses, 2 hours at 49c	0 98
Spring work—	
Ploughing, man and 2 horses, 7 hours at 49c	3 43
Discing, man and 2 horses, 2½ hours at 49c	1 14
Harrowing, man and 2 horses, 4¾ hours at 49c	2 29
Rolling, man and 2 horses, 1½ hour at 49c	0 65
Seeding, man, 3 hours at 25c	0 75
Cultivating, man and 1 horse, 7½ hours at 37c	2 78
Pulling, man, 44 hours at 25c	11 00
Hauling, man and 1 horse, 12 hours at 37c	4 44
Manual labour, 129 hours at 25c	32 25
	$85 49

Yield of mangels	910 bushels
Cost of producing 1 bushel	9·4 cents
" " 1 ton	$3 76

Cost of Producing Turnips after Oats

Figures based on 1 acre, Rotation G, for year 1923

Rent	$3 00
Share of manure and soiling crop	9 20
Use of machinery	3 00
Seed, 3 pounds at 75c	2 25
Autumn work, 1922—	
Ploughing, man and 2 horses, 6¼ hours at 49c	3 06
Ribbing, man and 2 horses, 2½ hours at 49c	1 22
Spring work—	
Harrowing, man and 2 horses, 6¾ hours at 49c	3 37
Discing, man and tractor, 1¾ hours at 80c	1 33
Ploughing, man and 2 horses, 11¼ hours at 49c	5 51
Rolling, man and 2 horses, ¾ hour at 49c	0 41
Seeding, man, 2½ hours at 25c	0 62
Cultivating, man and 1 horse, 6¼ hours at 37c	2 31
Hoeing, man, 47½ hours at 25c	11 87
Pulling, man, 35 hours at 25c	8 75
Hauling, man and 1 horse, 25 hours at 37c	9 25
	$65 15

Yield of turnips	730 bushels
Cost of producing 1 bushel	8·9 cents
" " 1 ton	$3 56

CULTURAL EXPERIMENTS

The land now used as an area devoted to investigating cultural methods for farm crops was purchased in 1913. It was laid off in one-fortieth-acre plots, and records were taken on these, using barley one year then oats another. The whole area was drained, and a series of investigational work was started in 1916. No manure or fertilizer had been used for many years previous.

The following rotations were used: Three years, hoed crop, grain, clover, for experiment No. V. Four-year, hoed crop, grain, clover, timothy, used for experiments Nos. I, II, IV, VI, VII, IX, X, XI and XII. Five-year, grain, hoed crop, grain, clover, timothy, used for experiments Nos. III and VIII.

The details concerning these have all been published in former reports of this Station. The 1922 report gave a seven-year average of most of these experiments. In this report it is proposed to make a few general remarks concerning each. We now have records from eight years' careful work, and some very interesting and valuable lessons have been learned. A brief summary taken from these observations follows, but it will well repay anyone to carefully study these 309 cultural plots.

EXPERIMENT I—RATE OF SEEDING CLOVER AND TIMOTHY

The best rate of seeding out was with 10 pounds timothy, 8 pounds red clover and 1 pound of alsike. Timothy and alsike alone have a tendency to smother out.

EXPERIMENT II—METHODS OF APPLYING BARNYARD MANURE

(A) The application of 10 tons of the manure after the hoed crop and 10 tons as a top-dressing after removing the clover hay leads for the eight years. The yield of grain was, of course, highest.

(B) When 20 tons of manure were used as a top-dressing on grain in the spring, the following clover and timothy crops were much greater than from the other plots. The yield of potatoes was low, and the grain about average. Worked out on a percentage basis, this method stood 99·7 per cent with the check only 71 per cent.

EXPERIMENT III—METHODS OF AFTER HARVEST CULTIVATION OF SOD LAND FOR GRAIN

Sod ploughed in August or early September and harrowed occasionally during autumn gave 10 per cent heavier yields of grain than late ploughing, and 27 per cent greater yields than spring ploughing. In this five-year rotation, the land after a hoed crop was prepared in different ways for grain. It was found that no fall treatment gave best results. These plots were worked without ploughing either autumn or spring. Late autumn ridging was next best, and proved of value to prevent washing.

EXPERIMENT IV—VARIETY OF NURSE CROP FOR YIELD OF HAY

Even after eight years the oats leads as the superior nurse crop by 8 per cent heavier yields of hay, followed by barley, then wheat, with very little between them.

EXPERIMENT V—METHOD OF SEED BED PREPARATION

Weather conditions at seeding greatly affect this investigational work, however, it would appear that the seed bed should be worked until good tilth is obtained.

EXPERIMENT VI—RATE OF SEEDING NURSE CROP OF OATS

The light seeding of oats gave 10 per cent increase in yields over the heavier seedings; 2½ bushels of oats gave the best yield of grain.

EXPERIMENT VII—DEPTH OF PLOUGHING SOD FOR ROOTS

Shallow ploughing continues to give best results. Sub-soiling on this type of fine, sandy loam, underlaid with gravelly clay subsoil has not proved satisfactory. It did no good.

EXPERIMENT VIII—DEPTH OF PLOUGHING SOD FOR GRAIN

Five inches seems to be the best depth for ploughing the fine sandy loam soil for grain. The autumn ploughing gave 10 per cent better yields of grain than the spring ploughing.

EXPERIMENT IX—RATE OF SEEDING NURSE CROP OF BARLEY

A thin nurse crop of barley has been followed by better crops of hay than when two bushels or over were sown. Comparing seedings of 1 bushel and 1½ bushels with 2 bushels and 2½ bushels, the former seeding was followed by hay crops that averaged 21 per cent heavier yields.

EXPERIMENT X—METHOD OF TREATING NEGLECTED LAND

Neglected land can be reclaimed in this province very quickly. Break a natural grass sod in July or August, top-work it well, cultivate it well for seed potatoes, apply from 1,200 to 1,300 pounds of fertilizer (home-mixed chemicals are cheapest), cultivate thoroughly, spray and care for the tubers and the crop should pay a fair profit over cost of fertilizers and labour, while the land will be in good tilth, ready to produce paying crops of grain and clover.

EXPERIMENT XI—DEPTH FOR LAYING UNDERDRAINAGE

Owing to the hard-pan of gravelly brick clay that underlies most of the land that requires drainage, there does not seem to be any advantage in going below 30 inches in laying tile drains. Where the hard-pan is near the surface, a depth of 24 inches has worked equally well.

EXPERIMENT XII—DEPTH OF SEEDING CEREALS

With barley the depth of seeding has not made much difference, but with oats, a depth of 3 inches was 7 per cent better than a depth of 2 inches, and 19 per cent better than a depth of 4 inches over a period of 8 years. This varies greatly with the season, with a dry season during planting the grain is better to be at least 3 inches deep, and with a wet season it should be nearer the surface.

HORTICULTURE

ORCHARDS

The orchards, on the whole, made good growth during the past season. All trees were protected from mice, during the winter, by tar paper mounded at the bottom with clay, but the snow was so deep in the winter of 1923 that a number of trees were attacked above the protected area. Where considered advisable, bridge-grafting was practised with fairly satisfactory results. Many trees suffered from winter injury, some being killed outright.

APPLES

The amount of bloom in the apple orchards was unusually small. Duchess, Yellow Transparent, Alexander, Ribston and Peewaukee gave fair yields. The following list shows varieties which suffered from winter-killing in 1923:—

GROWTH OF PREVIOUS YEAR ALL KILLED BACK	TREES ENTIRELY KILLED
Cranberry Pippin	Ontario
Grimes Golden	Baldwin
Jonathan	Blenheim
Banks Gravenstein	
King	
Spy	
Newtown Pippin	
Wagener	
Swazie.	

CHERRIES

Though many varieties of cherries gave a large showing of bloom, practically no fruit set, owing to unfavourable weather conditions at time of blooming. Governor Wood, Coes Transparent, Black Heart, Windsor and Napoleon were entirely killed in winter of 1923. The sour cherries fruited well.

PLUMS

Saunders, Imperial Gage, Columbia, Shropshire Damson and Fellenburg produced good crops; other plums gave a very low yield in 1923. Columbia continues to be a strong grower and heavy cropper. Saunders is an early, regular bearer. Oyama, Mankato and Oren, vigorous growers bearing a large amount of bloom early in the season, have never set a satisfactory crop of fruit. A number of trees of different varieties which had outlived their usefulness and were on the decline, were removed in the autumn of 1923, and will be replaced next spring.

PEARS

Pears gave practically no yield this year. A number of trees which, though appearing to be in a thrifty condition, were found to have trunks badly affected by disease, and having only a narrow strip of green tissue, were removed in the autumn of 1923. These will be replaced next spring. A number of such trees were broken by the gale of October 1.

SMALL FRUITS

STRAWBERRIES

The strawberries set out in 1920 wintered badly in 1922-1923 and during the past season were severely attacked by strawberry weevil. A new plantation was set out in the spring of 1923; and all varieties have made satisfactory growth, with the exception of Hermia, Cassandra, Desdemona, Parson's Beauty and Charles I, which set only one-eighth to one-quarter stand of plants.

RASPBERRIES

The raspberries in the 1919 plantation continued to make good growth, and last season set a fair quantity of fruit. The crop was greatly reduced by a heavy storm of wind and rain which occurred at the height of the fruiting season.

BUSH FRUITS

The bush fruits in the new plantation made good growth during the past season, but have not yet come into full bearing. The best varieties were as follows:—

Black Currants.—Victoria, Buddenburg, Champion, Climax, Topsy.

Gooseberries.—The following list gives the best yielding varieties in order: Downing, Pearl, Mabel, Keepsake, Red Jacket.

VEGETABLES

BEANS—VARIETY TEST

Twenty-two sorts of beans were planted on June 8, for green beans. Their season lasted from August 15 to September 24. The following list gives the best varieties in order:—

1. Masterpiece Ottawa-2746.
2. Bountiful Ottawa-2825.
3. No. 1 White Pole Ottawa-3209.
4. Plentiful French Ottawa-2824.
5. Davis White Wax Ottawa-2772.
6. Refugee 1000 to 1 Ottawa-1631.
7. Yellow Eye Yellow Pod Ottawa-2821.
8. Hodson Long Pod Ottawa-2748.
9. Extra Early Valentine Ottawa-2543.

The following sorts are recommended in order for cooking quality: Masterpiece, Round Pod Kidney Wax, Wardwell Kidney Wax, Extra Early Valentine, Plentiful French and Stringless Green Pod.

BEANS—CULTURAL TEST

Two rows of each of two varieties of beans, Round Pod Kidney Wax and Stringless Green Pod, were planted, June 8, in rows 30 inches apart, the seed 2 inches, 4 inches and 6 inches in the row; one picked green, the other ripe.

The cultural test would indicate that planting 2 inches apart in the row gave the best results for both green beans and for seed.

BEETS—VARIETIES

Nine varieties were tested this year. They were thinned out when large enough for canning (August 6) and on August 21, 27, October 4 and 15, quantities were marketed. The final harvest was made October 1. These are recommended in the following order: Early Model, Early Wonder, Detroit Dark Red (McDonald), Crosby Egyptian and Detroit Dark Red (Ottawa-2009).

BEETS—CULTURAL TESTS

To determine the effect of seeding at different dates, seed of Detroit Dark Red was sown at intervals of ten days, in rows 30 feet long and 30 inches apart—one row at each date. Fifteen feet of each row were used to determine relative earliness, quality and yield as a green table vegetable. The remaining 15 feet of each row were not pulled until the end of the season. A large number of those were coarse, overgrown and unmarketable.

This cultural test would indicate that beets do well sown anytime from the middle of May to the end of June. Sowing at different dates allows for a continuous supply of table-sized beets, and the late sown are best for winter use.

BRUSSELS SPROUTS

Three varieties, sown May 14, germinated May 24, were transplanted in rows July 3, and were ready for use on October 30. The following list is in order of merit: Amager Market, Dalkeith, Paris Market.

CABBAGE

Twenty varieties or strains of cabbage were sown in open ground May 14, and on July 3 were set out in rows 30 inches apart, plants 20 inches apart in the

row. The following sorts are given in the order of yield of marketable heads: Succession, Danish Roundhead, Danish Ballhead (Short Stem strain), Summer Ballhead, Marblehead Mammoth, Danish Ballhead (Solid Emperor strains), Amager Danish Ballhead. The yields were good, highest was over 30 tons per acre, and the lowest mentioned almost 20 tons per acre. Chester Savoy did not head up well.

CELERY VARIETIES

Fifteen varieties of celery were sown in hotbeds, on May 1, pricked out June 6, and on July 4 were transplanted in rows 5 feet apart, plants six inches apart in the row. The crop of celery was particularly good, and yields were obtained that compared favourably with other years; the highest, Giant Pascal, 6 tons, 1,920 pounds per acre. The best early sorts were: White Plume Golden Self Blanching and Rose Ribbed Golden Self Blanching. The best late sorts are: Winter Queen, New Emperor, Easy Blanching, Evans Triumph and the Giant Pascal. The celery was harvested in good condition following the frost of October 20. The very mild autumn made it difficult to store it safely.

CELERY—CULTURAL TEST

An experiment was conducted to determine the merits of various methods of blanching. Seed of Golden Self Blanching was sown in hotbeds May 1, pricked out June 6, and transplanted in open ground July 4. The following methods were used:—

(1) Planted in bed 6 feet by 6 feet, plants 6 inches apart each way.
(2) Planted in single row, plants 6 inches apart, earthed up.
(3) Planted in double row, plants alternate, 6 inches apart each way, blanched with roofing.
(4) Planted in trenches, plants 6 inches apart, earthed up.
(5) Planted in single row, plants 6 inches apart, blanched with boards.

The class planted 6 inches by 6 inches, while giving a large yield, contained average plants weighing less than 4 ounces, and could only be of use for soups. Those planted in rows 5 feet apart gave plants averaging 1½ pounds, and when earthed up gave the best quality of celery.

SWEET CORN

Twenty-eight varieties or strains were grown this year, planted in rows 3 feet apart on June 4. The yields are computed on the crop from a 30-foot row of each variety. Owing to the unfavourable season, the yield of marketable ears was small. Many sorts which usually are among the best did not mature for use. The following sorts are named in order of marketable heads produced: Pickaninny, Gehu, Tom Thumb, Nuetta, Assiniboine, Early Adams, Malakoff, Early Mayflower, Pocahontas.

LETTUCE

Eighteen varieties of lettuce were included in this year's test. All grew exceptionally well. We recommend the following cabbage or heading varieties: Earliest Wayahead, Improved Hanson, New York and Denver Market. Black Seeded Simpson and Grand Rapids are most satisfactory curled loose-leaf varieties.

PARSLEY

Of the four varieties of parsley grown, Moss Curled proved extra good, Triple Curled and XXX were good. Plain was unsuited for garnishing.

GARDEN PEAS—VARIETIES

Twenty-three varieties or strains were sown, May 15, in rows 3 feet apart. Those producing the largest yields of unshelled peas were: McLean Advancer, Harris; McLean Advancer X Gregory Surprise Ottawa, 2336, McLean Advancer (Livingston), Lincoln, Gregory Surprise X English Wonder Ottawa, 2343, Improved Stratagem, American Wonder B-Ottawa, 2332.

Those recommended from a quality basis are, Gradus, Gregory Surprise, Potlatch and Improved Stratagem.

PEAS—CULTURAL TEST

An experiment was conducted using three varieties of peas, each variety planted 1 inch, 2 inches and 3 inches apart, in rows 3 feet apart, on May 15, 1923. English Wonder, a dwarf sort, was best at 2 inches; Thomas Laxton, medium in height, best at one inch; Stratagem, a strong grower, best at 3 inches.

PUMPKINS

Five varieties of pumpkins were planted in open ground, June 7. These were grown in hills 9 feet apart each way. The Connecticut Field gave a yield of over 23 tons per acre. King of Mammoths was second in yield and Small Sugar, which has by far the best quality of flesh, was third.

POTATOES—CULTURAL EXPERIMENT

Sprouting.—A sprouting experiment with an early and a main crop variety of potatoes was started this year. Tubers of each variety were exposed, in subdued light, for six weeks previous to planting, and planted on same date as those of same variety kept unsprouted until date of planting. Sets were placed 14 inches apart in rows 30 inches apart.

The sprouted Irish Cobblers were ready for use July 19, nine days before the unsprouted sets, and yielded 452 bushels, being 45 bushels 12 pounds more marketable potatoes, and also 3 bushels and 46 pounds more unmarketable potatoes than the unsprouted sets.

The sprouted Green Mountains were ready for use July 28, or 8 days earlier than the unsprouted, and yielded 640 bushels, 20 pounds, being 154 bushels, 26 pounds more marketable potatoes, but gave 11 bushels and 18 pounds less unmarketable potatoes than the unsprouted sets.

Date of planting.—An experiment was conducted with Irish Cobblers and Green Mountains, to determine the effect of date of planting on yield of tubers. This experiment will be continued for five years.

For both sorts May 25 proved to be the best date of planting in 1923. The Irish Cobblers planted on that date yielded 523 bushels and 34 pounds, or 120 bushels and 32 pounds more than those planted May 18, which were second in yield of marketable stock.

The Green Mountains planted May 25 yielded 580 bushels and 4 pounds, or 48 bushels and 58 pounds more than those planted June 8, which gave the second largest yield.

RADISHES

The sorts of radishes have greatly improved in recent years. Practically all of the nine sorts grown were good in quality. They were sown May 12, in rows 15 inches apart. The following sorts are recommended: Rennies XXX Scarlet Oval, Round Scarlet Oval, Scarlet Turnip White Tip, Early Scarlet White Tip and Olive Shaped French Breakfast.

SQUASH

Nine varieties or strains were sown June 7. English Vegetable Marrow gave the highest yield, but, quality considered, the following are recommended: Golden Hubbard, Delicious, Mammoth Warted Hubbard. Several sorts were badly injured by bacterial wilt.

TOMATOES—VARIETIES

Twenty-six varieties or strains were sown in hotbeds May 1, pricked out May 17, and transplanted in open ground June 23, plants 4 feet apart each way. Thirteen sorts ripened fruit September 19. They are recommended in the order of yield, earliness and quality: Alacrity No. 1 Ottawa-3031, Earliana Grade 2, Alacrity No. 6 Ottawa-3033, Avon Early, First of All, John Baer, Earliana Grade 3, Fifty Day, Prosperity, Sunnybrook Earliana, Bonny Best (Keith), Red Canner Danish Export.

TOMATOES—CULTURAL TEST

With the object of determining the best method of pruning to single stem, a five-year experiment was started this season. Seed was sown in hotbeds May 1, pricked out May 17, and transplanted in open ground June 23. The rows were 4 feet apart, the plants were set one foot apart in the rows. Both the Alacrity and the Bonny Best gave best results in 1923 when pruned to three clusters of fruit on the one stem.

TREES, SHRUBS AND FLOWERS

On the whole, trees, shrubs and perennial flowers wintered well. The perennials and many of the low-growing shrubs were covered throughout the winter by a thick blanket of snow. The tips and upper parts of many of the tall, semi-hardy shrubs were badly winter-killed, but, as the past season was favourable for growth, most of these have made a good recovery.

PERENNIALS

The hybrid tea roses that received extra protection in the way of rough boards in addition to banking with earth and covering with dry autumn leaves. All came through the winter safely. Most of those that were only banked with earth were injured or killed. The severe winter also injured many of the hybrid perpetuals. They recovered early in the season, and with the climbers, Dorothy Perkins, Goldfinch and Crimson Rambler, gave a profusion of bloom.

The season for perennials was late throughout the year. Dahlias began blooming August 1, and made the best showing they ever have at this Station until killed by frost October 23, 1923. The perennials, including the Kentucky water-lilies, gave an abundant profusion of bloom from early May until late October.

BIENNIALS

Pansies, Dianthus Hedewiggii and Dianthus Barbatus, in choice variety, were each grown in solid beds, and, by their profusion of rich bloom of bright colours, attracted a great deal of attention.

ANNUAL FLOWERS

The annual flowers along either side of the direct driveway to the Mount Edward Road did exceptionally well, and made a wonderful display. The plants were started from seed sown in hotbeds, and as the first pair of true leaves had developed, were transplanted to flats, the plants being set 2 inches

apart each way. This method tends to produce stocky, vigorous plants with a well developed root system. Such plants, when transplanted to open ground, receive little or no check. Among the annuals worthy of special mention are: Aster, in variety; Stocks, Celosia or Cockscomb. Helichrysum (Straw Flower), Rodanthe (Everlasting); and Statice or Sea Lavender yield an excellent supply of flowers for winter bouquets if cut in full bloom, tied in bunches and hung to dry in a shaded place, with heads down. The following annuals, sown outside June 18, are also worthy of special mention: Lavatera (Annual Mallow); Malope (Mallow); Nigella (Love-in-a Mist), variety Miss Jeckyll; superb double and mixed fringed Petunias, and Matthiola Bicornis. The last named, also known as Evening-scented Stock, exhales a delightful fragrance in calm evening air.

The season was very favourable for the lawns. A beautiful green carpet was maintained throughout the entire season, the last clipping being made December 3, 1923.

CEREALS

ROTATION FOR VARIETY TESTS

The cereals were grown on the special four-year grain growing rotation. This rotation has been used for cereal plot work since 1914, and is as follows:—

First year: hoed crop (variety test of roots, corn, etc.) manured with 12 tons per acre. Second year: grain, seeded with 10 pounds of red clover, 2 pounds of alsike and 5 pounds of timothy per acre. Third year: clover hay, cut early; clover stubble top-dressed with 8 tons manure per acre, and ploughed early in autumn. Fourth year: grain, seeded with 8 pounds red clover and 2 pounds alsike per acre, to be ploughed under as a soiling crop.

This rotation enables the grower of seed grain to have one-half of the land in cereals each year.

UNIFORM TEST PLOTS OF CEREALS

The variety test of all cereals was conducted in duplicate. They were sown on May 19, and notes taken throughout the season on germination, stand, development, diseases, ripening and harvesting conditions. The wheat and barley were given the hot-water treatment, and the oats the formalin treatment for smut. These both proved very effective. These plots were carefully rogued when heading out and as they matured. Advantage was taken of the difference in the time of maturing to get out strains that are otherwise hard to detect. A sufficient quantity for next season's plots was hand-selected at harvest.

BARLEY

The barley plots were good except on a small area near the Mount Edward Road of heavy, low land. For this reason the yields of Plots A of Albert, and Charlottetown No. 80 were discarded for purposes of comparison.

Thirteen sorts were tested. The average yield of the 26 plots was 43 bushels and 32 pounds. Among the sorts that have been tested for 12 years or over, the Charlottetown No. 80 (2-row) leads with an average margin from 1912-23 of 4 bushels over O.A.C. 21 (6-row), 4 bushels 8 pounds over Gold (2-row), 4 bushels 43 pounds over Stella (6-row), 4 bushels 40 pounds over Swedish Chevalier (2-row), 5 bushels 8 pounds over Manchurian (6-row) and 16 bushels 9 pounds over Albert.

Among the new sorts, Horn C.I. 926 secured last year from Washington is promising.

OATS

Eleven sorts of oats were tested in hand-selected plots. Liberty, a hulless sort, was injured by the formalin treatment and did not germinate. The average yield of the 20 plots was 69 bushels and 14 pounds. Of the twenty-one sorts that were tested in 1910, the first season that cereals were grown at this Station, only three are now being continued. The fourteen-year averages of these are as follows: Victory, 82 bushels 26 pounds; Gold Rain, 79 bushels 15 pounds; Banner, Ottawa 49, 78 bushels 32 pounds.

Seven strains of Banner oats were tested in duplicate at the Station in 1923. The average yield of the 14 plots was 81 bushels and 21 pounds. The following are in order of yield: Saskatchewan No. 99, Langilles, Ottawa 49, MacDonald College 44, Waughs, Dixons and Dows.

Four new varieties that have received considerable prominence in recent years gave an average yield of 64 bushels and 30 pounds. In order of yield they stood as follows: Northland, Columbian, Prolific and Longfellow.

SPRING WHEAT

Twelve varieties of spring wheat were tested in 1923. Of the 13 varieties sown in 1910, five have been continued. A fourteen-year average of these is as follows: Huron (bearded) 36 bushels 30 pounds, Chelsea (beardless) 34 bushels 51 pounds, Marquis (beardless) 34 bushels 9 pounds, White Russian (beardless) 32 bushels 31 pounds, and Red Fife (beardless) 30 bushels 51 pounds.

Among the newer sorts tried at this Station, Early Russian has produced large crops. The average yield of this sort for 8 years was 39 bushels, 43 pounds.

A strain selected out of a sample of wheat received from Mr. W. D. Whitehead of Clifton, P.E.I., in 1918, has proved to be not only prolific, but to be of extra good baking quality. We gave this our Charlottetown number of 123. The average yield of this sort for five seasons was 39 bushels 14 pounds. Other varieties yielded as follows: Ruby (average 6 years) 31 bushels 6 pounds, Master (average 2 years) 27 bushels 2 pounds.

MULTIPLYING AREAS OF CEREALS

The most promising sorts of cereals for P. E. Island conditions are multiplied each year on the rotations and larger fields of the Station, and registered seed is sold to growers of pure seed. The demand for this seed is so great that we are seldom able to sell more than 2 bushels to one applicant.

The following table gives the details of growing these areas:—

Crop	Name of Variety	Field	Previous crop	Acreage	Yield per acre	
				Acres	Bush.	Lb.
Barley	Charlottetown No. 80	CC–II	Mangels	3·0	43	14
"	" "	Blake	Corn	7·0	43	10
"	" "	A–IV	Timothy	1·0	42	9
Oats	Banner Ottawa 49	A–I	Mangels	1·0	72	3
"	" "	B–III	Clover	1·0	65	27
"	" "	Connolly	Timothy	10·0	27	–
"	O.A.C. 72	G–IV	Timothy	0·4	83	–
Wheat	Charlottetown No. 123	G–VI	Turnips	0·4	33	32
"	Early Red Fife Ottawa 16	C–III	Potatoes	0·57	29	30
"	Huron Ottawa 3	B–I	Potatoes	1·0	23	19

FORAGE CROPS

ENSILAGE CROPS

INDIAN CORN

The corn seeding was delayed ten days on account of tile drainage operations. Sowing was on June 20, and harvesting September 29. Sixteen sorts were grown on 1-100 acre plots, giving an average yield of 13 tons, 37 pounds of green ensilage per acre. The average amount of dry matter produced was about 2 tons per acre. Comptons Early, Leaming, Twitchells Pride, Longfellow and Golden Glow gave the highest yield of dry matter per acre in the order named. Of these, Twitchells Pride and Longfellow were the only ones that were mature enough to form ears.

SUNFLOWERS FOR ENSILAGE

Nine sorts of sunflowers were sown June 20 and harvested September 29, 1923. Sowing was ten days late. The average yield of green ensilage was 13 tons, 546 pounds per acre. Russian Giant, Manchurian, Mixed Mennonite and Ottawa-76 gave the highest yield of dry matter per acre in order named. Manchurian and Mixed Mennonite were most mature.

ROOTS

FIELD CARROTS

Fifteen varieties or strains of field carrots were sown June 11 and harvested November 9. They were injured by the carrot rust fly, which did much damage during the season in the neighbourhood of Charlottetown. The average yield of roots was 4 tons, 600 pounds, containing 1,045 pounds of dry matter per acre. Improved Intermediate, Danish Champion and White Belgian gave the best yields in the order named.

MANGELS

Twenty-five sorts of mangels were tested, and many of the strains were found to be mixed. The plots were sown June 11, and harvested November 8, 1923. The average yield of roots was 20 tons, 880 pounds, containing 2 tons, 1,157 pounds of dry matter per acre. The following sorts all yielded over 3 tons of dry matter per acre and were reasonably true to type: Barres Sludstrup, Barres Sludstrup No. 3084, Yellow Intermediate, Barres Stryne and Giant White Sugar.

SUGAR BEETS

Five sorts of sugar beet were obtained from different sources. This was sown at the same time as the mangels, and the average yield was 16 tons, 1,400 pounds per acre. Samples of these roots were sent to the Dominion Chemist for analysis and determination of sugar content. The following sources of seed are arranged in order of yield per acre of green roots: Ottawa, Ont., Chatham, Ont., Denmark, Kitchener, Ont., and Holland.

TURNIPS

Thirty varieties and strains of turnips were grown in test plots at Charlottetown. They were sown June 6, and harvested November 8, 1923. The average yield of roots was 27 tons 1,317 pounds, containing 3 tons 500 pounds of dry matter per acre. The following sorts yielded over 4 tons of dry matter per acre, and are given in order of yield of dry matter: Dalis Swede, Bangholm, Halls Westbury (MacDonald), Halls Westbury (Ewing).

BANGHOLM SELECTED TURNIP SEED

The strain of Club Root-resistant Bangholm seed obtained from Denmark in 1920 has proven quite resistant to this destructive disease as previously reported. Stecklings were grown in 1923, and it is planned to produce considerable seed in 1924. The demand is much greater than the supply at present, and the growing of this seed should prove profitable. The yield of these roots on G-V was 18¼ tons; they cost $3.57 per ton to grow, and contained 14.5 per cent dry matter—more than any other roots tested. Nine other strains of Bangholm turnips tested averaged 11.9 per cent, dry matter and the average of all the turnips was only 12.02 per cent. The seed grown at Charlottetown has given very satisfactory results in many places. Several men have written that it has enabled them to grow turnips on land which they could not use for other strains of this crop.

SOIL AND FERTILIZER INVESTIGATIONAL WORK, 1923

SOILS

During the season of 1923 composite soil and subsoil samples were taken to a depth of 7 inches, and from 7-14 inches respectively on all of the six Illustration Stations throughout P. E. Island. These were sent to the Dominion Chemist at Ottawa for analysis, but a report on them has not yet been received.

Similar soil samples were taken from representative fields at from 2 to 4 miles from the City of Charlottetown. These fields had all been in oats the previous year. As complete a history as could be obtained was supplied with each sample. These soils would all be classed as fine, sandy loams. Dr. Shutt, in giving a summary of these soils wrote:—

"From the standpoint of plant food content as measured by chemical analysis, these soils may probably rank with those of average productiveness; their percentages of nitrogen, phosphoric acid and potash while fair, are not equal to those of our best soils. An excellent feature, however, in this connection is that though the total amounts of these constituents present are not large, the proportion which may be considered as more or less immediately available is relatively high.

"The results in general from this investigation would suggest for the maintenance and increase of the fertility of these soils: (1) the addition of humus-forming material as furnished by the application of farm manures, the turning under of green crops, e.g., buckwheat, rye and clover and the adoption of a comparatively short rotation in which clover or other legume is a member; (2) the application of ground limestone or other lime-bearing material to correct acidity and furnish lime for crop use, and (3) the appropriate and rational employment of commercial fertilizers in accordance with the findings of this examination and the special requirements of the crops to be fertilized."

EXPERIMENTAL WORK WITH FERTILIZERS

SOURCES OF LIME

An experiment was started in the Matheson Field in 1921 to compare the relative value of burned lime and ground limestone applied at different rates, and oyster shell mud and basic slag as sources of lime. The turnips the first year did so well on the check plots, which it turned out were on more fertile soil than most of the other plots, that the results have appeared negative so far. In 1922 the oats lodged so completely over the whole area that it was difficult to make comparisons. The clover on these plots was light in 1923, due partly to the effect of the lodging of the grain in 1922.

Taking the three years as a whole, the ground limestone, applied at from one to two tons per acre, appeared to give better results than the other forms.

SOURCES OF NITROGEN EXPERIMENT

In this experiment, started in 1921, four nitrogenous fertilizers—nitrate of soda (15 per cent), sulphate of ammonia (20 per cent), cyanamide (14 per cent) and nitrapo (15 per cent)—were compared. In whatever form, the amount of nitrogen furnished was the same in each instance, viz. 30 pounds per acre. Phosphoric acid, where furnished, was at the rate of 48 pounds per acre, and potash at the rate of 30 pounds per acre.

Cyanamide is the product of an electrical process. It is poisonous to germinating seeds. For this reason it should be applied two weeks before seeding.

Nitrapo is a by-product of the Chilean Nitrate industry, and contains 15 per cent nitrogen and 15 per cent potash, both in a readily available form.

These nitrogenous fertilizers were applied singly, then in combination with superphosphate or with superphosphate and muriate of potash. The crops used were turnips in 1921, oats in 1922 and hay in 1923.

The first season the nitrapo gave the largest returns, nitrate of soda being nearly equal to it. Sulphate of ammonia gave 20 per cent less yield, and cyanamide about 50 per cent less, or about half a crop. The second season, the plots that had nitrate of soda applied the previous year gave the best yields; the sulphate of ammonia was almost as good, and the nitrapo a fairly close third; the cyanamide plots were the poorest.

The third season following the application of fertilizers to the plots, those supplied with nitrate of soda gave the best returns, with nitrapo second, sulphate of ammonia more than 10 per cent behind, and the cyanamide plots poor. The yields of all the duplicate plots for the three years, worked out on a percentage basis, would place nitrate of soda first, or 100 per cent. Nitrapo on that basis would be about 99 per cent, sulphate of ammonia 87 per cent, and cyanamide 73 per cent. The soil was a sandy loam of moderate fertility. All plots were in duplicate. The lodging of the oats in 1922 no doubt influenced the yields that year, but also greatly reduced the yields of hay in 1923. It is hoped to repeat this experiment.

Plan of Experiment with Potatoes

To ascertain the effect of applying Nitrate of Soda at different times in the early periods of growth. To compare Nitrate of Soda and Sulphate of Ammonia as sources of Nitrogen. Fertilizers applied in pounds per acre. Potatoes planted June 1, 1923

Numbers of Plots	Nitrate of Soda (15½ per cent) Time of Application			Sulphate of Ammonia (20%)	Superphosphate (16%P_2O_5)	Muriate of Potash (50%K_2O)	Pounds per acre of			Average yield per acre—Potatoes					
	Planting Time	Appearance of Crop	Fifteen Days Later				N.	P_2O_5	K_2O	Marketable		Unmarketable		Total	
										bush.	lb.	bush.	lb.	bush.	lb.
35 and 28	Check									154	10	23	50	178	30
31 and 40	330				300	150	50	48	75	228	20	32	50	261	10
*32 and 30	220	110			300	150	50	48	75	280	20	38	10	318	30
33 and 29	110	110	110		300	150	50	48	75	234	20	31	30	265	50
34 and 27	110	220			300	150	50	48	75	219	40	36	—	255	40
36 and 26		220	110		300	150	50	48	75	164	20	32	20	196	40
37 and 25	No	Nitrogen			300	150		48	75	181	20	27	50	209	10
23 and 15	Ch	eck								92	50	28	10	121	30
24 and 38				250	300	150	50	48	75	154	30	31	10	185	40
17 and 4	220				300	150	33	48	75	251	40	25	10	276	50
5 and 16				165	300	150	33	48	75	205	30	23	10	228	40
6 and 14	220				300		33	48		154	20	25	20	179	40
7 and 13				165	300		33	48		161	20	29	50	191	10
9 and 12	220					150	33		75	181	10	23	10	204	20
10 and 11				165		150	33		75	158	50	29	—	187	50
3 and 8	Cb	eck								140	40	24	40	165	20
39 and 22	165			125	300	150	50	48	75	198	10	30	40	228	50
1 and 20	110			82	300	150	33	48	75	204	50	29	50	234	40
21 and 19	330						50			141	40	18	20	160	—
18 and 2				250			50			170	10	30	30	200	40

*Note—Plot 30, Site of old straw barn; land more fertile. (Estimate increase in crop from that source 20 per cent).

FERTILIZER INVESTIGATION WITH POTATOES

In the 1922 report from this Station returns were given from an experiment in fertilizing land for potatoes. The work of the first section of that experiment was duplicated in 1923. It had to do with a comparison of the effect of applying nitrate of soda at different stages in the growth of the potatoes. A total of 330 pounds nitrate of soda, 300 pounds of superphosphate and 150 pounds of muriate of potash was applied per acre to all of the plots except the checks.

The fertilizer was applied by hand, the plots staked and a cord placed about each. The day the potatoes were planted, June 1, 1923, was dull and calm, and there was a light shower at night. Irish Cobbler potatoes were used and the experiment was along the south side of the Fitzgerald Field. All plots were in duplicate, and were one-twentieth of an acre in area. They were cultivated and sprayed uniformly.

The highest average yield of duplicate plots was taken as 100 per cent, and the average returns from the other duplicate plots are compared in percentages with it.

The highest yield, an average of 283 bushels per acre, taken as 100 per cent yield, was obtained by applying 220 pounds of nitrate of soda at planting time and 110 pounds at the appearance of the crop. The second place, 94.4 per cent, was secured by applying 110 pounds of nitrate of soda at planting, again at the appearance of the crop, and again 15 days later. Third place, 92.8 per cent, was obtained by applying the whole 330 pounds nitrate of soda at planting time. Fourth place, 90.8 per cent, followed when 110 pounds were applied at planting time and 220 pounds at the appearance of the crop. The poorest result from the application of nitrate of soda was 69.9 per cent crop, when 220 pounds were applied at the appearance of the crop and 110 pounds 15 days later. The checks without fertilizer averaged 55 per cent of the best yields.

These results are slightly different from those of last year; but, taking both years into consideration, they indicate that nitrate of soda should be applied either at the time of planting or part then and the balance as soon as the crop appears above ground to get best results.

NITRATE OF SODA VS. SULPHATE OF AMMONIA

These two sources of nitrogen were compared when supplied separately and in different combinations with one another. Keeping the other fertilizers constant at 300 pounds of superphosphate and 150 pounds of muriate of potash, the nitrate of soda when used as the source of 33 pounds of nitrogen per acre, gave 100 per cent crop compared with an 82.6 per cent crop when the sulphate of ammonia was the source of the 33 pounds of nitrogen. When 16½ pounds of nitrogen were supplied by each source, an 84.7 per cent crop was obtained. When 25 pounds of nitrogen were supplied by each source, the crop yield fell to 82.7 per cent. When the entire supply of nitrogen was withdrawn from the fertilizer leaving the same amounts of superphosphate and muriate of potash, the comparative yield was 75.6 per cent and the checks without fertilizer gave 55.8 per cent of the best yields.

COMMERCIAL FERTILIZER VS. FARM MANURE

This experiment was put in in duplicate on the Connolly Field. The potatoes were planted June 16, in plots one-sixteenth of an acre each. The land was poor. The chemicals were bought separately and home-mixed, and the following quantities per acre gave the best result: nitrate of soda 130 pounds, sulphate of ammonia 100 pounds, superphosphate 500 pounds and muriate of potash 160 pounds—a total of 890 pounds of the mixture per acre.

The average of these duplicate plots was 169 bushels and 52 pounds per acre; for purposes of comparison this is considered 100 per cent crop. One half the above quantities of fertilizer was applied to plots that were also manured with 10 tons of farm manure. The average yield from these was 84.4 per cent.

These were compared with plots which received 20 tons per acre of farm manure which gave a 76.7 per cent crop, and with check plots which were planted without manure or fertilizer, and which gave an average yield of 28.3 per cent.

Poor land given a heavy dressing of commercial fertilizer will produce a good crop of seed potatoes. The soil after potatoes, if properly worked, will produce a fair crop of grain and good hay. This is one of the quickest and most profitable ways of improving neglected land on P. E. Island.

SOURCES OF PHOSPHORIC ACID

An experiment to compare different grades of basic slag, rock phosphate and superphosphate as sources of phosphoric acid in a complete fertilizer was conducted on Field CC-II, with barley as a nurse crop for clover.

Six different kinds of basic slag were used at two different rates each. Three different rates of ground rock phosphate were used, and two rates of superphosphate.

Ground limestone was also added to the lowest rate of superphosphate. Six check plots were regularly distributed over the field. The entire field, including checks and paths, received 100 pounds of nitrate of soda and 50 pounds of muriate of potash.

The crop of barley was good, averaging 43 bushels and 14 pounds per acre from all plots. No definite conclusions could be drawn *re* the best source of phosphoric acid. Apparently the soil contained sufficient to grow a full crop of barley, since the check plots scattered all over the field averaged 45 bushels per acre. Careful records will be kept on succeeding crops, and results will be published in later reports.

POULTRY

The poultry work at this Station this year is a sequel to the work that has been carried on in the past, namely the further development of a uniform laying strain of Barred Plymouth Rocks and single comb White Leghorns, the two most popular breeds in Prince Edward Island.

All birds are trap-nested throughout the year, and only those making a record of 150 eggs and over in their pullet year are kept. As only birds of one year and older are used as breeders, lights are used in the pullet laying houses during three of the winter months, thus greatly adding to the winter production.

To further carry on the pedigree work from last year, several pedigree males of both breeds were procured, and these were mated with our best layers. The chicks from these matings on being hatched, were leg-banded, this band being placed later in the wing, and the bird carries this band throughout its life. It is found that stock from these matings has a ready sale, and is more in demand than that from mass matings.

STOCK

The following table shows the sex and number of birds on hand January 1, 1923:—

Breed	Males	Hens	Pullets	Total
Barred Plymouth Rocks	15	49	32	96
White Leghorns	33	119	92	244
Totals	48	168	124	340

HOUSING

The poultry buildings now in use are:—

One administration building with office and rooms for incubation, for the storing and mixing of feed, and the candling and storing of eggs.

Two permanent cotton-front, straw-loft laying houses, 16 by 32 feet, each building suitable for 100 hens.

Two straw-loft, portable colony houses, 8 by 12 feet, used for storing feed.

One shed-roof, cotton-front colony house, 8 by 12 feet.

Three shed-roof, cotton-front colony houses, 10 by 12 feet.

Twenty-two shed-roof, cotton-front contest houses, 10 by 12 feet, with a solid partition through the centre, dividing the house into two pens, 6 by 10 feet, suitable for ten birds in each pen.

A house on the Blake property, recently purchased by the farm, was moved near the poultry plant, and remodelled into a dwelling for the Poultryman.

EGG PRODUCTION

Owing to the fact that most of the chicks were late hatched, the pullets were out on range longer than usual, and were not placed in their winter quarters, nor did they begin to lay as early as usual. Lights were used for the three winter months, and were found to be an aid to production.

The mature hens were not fed for egg production until the beginning of the breeding season.

WHITE LEGHORN PULLETS

S.C. White Leghorn pullets bred and raised at the Charlottetown Experimental Station were kept for egg production for one year. On December 1, 1922, there were 93 started in the pens. On the first of June there were 80, and on November 30, 1923, after culling out the poorer ones during the summer, there were 47 with records from 151 to 244 eggs each that were held for breeding purpose for next season. Taken by months there was an average of 73 hens for one year. They laid 11,235 eggs, worth $267.74, at a cost of $137.09 for feed and a gain over the cost of feed of $130.65. The total feed consumed was 3 tons, 707 pounds made up as follows: 4,487 pounds grain, 1,025 pounds mash, 19 pounds beef scrap, 149 pounds grit, 157 pounds shell, 600 pounds roots and 270 pounds sprouted oats. These hens laid an average of 147.7 eggs at a cost per hen of $1.83, or at 14¾ cents per dozen. The average price obtained was 28⅔ cents per dozen, giving a gain over the cost of feed of $1.61 per hen.

BARRED PLYMOUTH ROCKS

The Barred Rock pullets bred at the Experimental Station also gave a good account for the year. Thirty-four were put in the pen December 1, 1922; on June 6, there were 26, and on November 30, 1923, after the summer culling, 21 remained for breeding purposes. These birds laid 3,926 eggs, worth $94.29, at a cost of $65.91 for feed, and a gain over cost of feed of $28.38. These pullets averaged 148.8 eggs for the year, at a cost of $2.33, giving a gain over cost of feed of 97 cents per hen.

INCUBATION AND BROODING

The following tables compare the fertility and hatchability of eggs set in March with that of eggs set in April; also the fertility and hatchability of Barred Rock with White Leghorn eggs.

COMPARING MARCH AND APRIL HATCHINGS

Month Hatched	Total eggs set	Number fertile	Per cent fertile	Number of chicks	Per cent total eggs hatched	Number of chick alive when wing banded	Per cent chicks alive when wing banded	Total eggs required for one chick hatched	Total fertile eggs for one chick	Total eggs for one chick when leg-banded
March	1,155	818	70	503	43	347	69	2·29	1·6	3·3
April	1,732	1,309	75	804	46	683	85	2·1	1·6	2·2
Totals and averages	2,887	2,127	73·6	1,307	45·2	1,030	78·8	2·20	1·6	2·8
B. R.	1,119	798	71	465	41	324	69	2·4	1·7	3·4
W. L.	1,769	1,329	75	842	48	706	84	2·1	1·6	2·5

EGGS SET IN MARCH, HATCHED IN APRIL

—	Barred Rocks	White Leghorns
Total eggs set	568	587
Number fertile	439	455
Per cent fertile	77	77
Number of chicks hatched	244	259
Per cent total eggs hatched	43	44
Per cent fertile eggs hatched	56	57
Total eggs required for one chick	2·3	2·2
Total fertile eggs required for one chick	1·7	1·7

EGGS SET IN APRIL, HATCHED IN MAY

—	Barred Rocks	White Leghorns
Total eggs set	426	886
Total eggs fertile	312	732
Per cent fertile	73	82
Number chicks hatched	152	438
Per cent total eggs hatched	35	49
Per cent fertile eggs hatched	48	59
Number eggs required for one chick	2·8	2·0
Number fertile eggs required for one chick	2·0	1·6

COST OF RAISING CHICKS

The following table gives the number of chicks on hand the first and last of each month, and the total feed and cost to raise the chicks from May 1, 1923, to October 30, 1923:—

The following tables show the difference and gain in weight and feed consumed by Barred Rocks and White Leghorn chickens for the months of July, August and September:—

COST OF FEEDING LEGHORN CHICKS

July 1 to September 30, 1923

Month	Number of chicks	Wright first of month	Weight end of month	Gain in weight	Grain	Mash	Grit	Shell	Meat	Buttermilk	Total cost of feed	Cost per chick
		lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	$ c.	$ c.
July	291	221	400	179	470	375	5	.....	15	600	20 50	0 07
August	234	307	489	182	925	290	8	4	30	700	30 83	0 13
September	234	489	633	144	1,070	312	6	4	25	700	36 87	0 15

COST OF FEEDING B. P. ROCK CHICKS

July	138	108	255	147	190	180	4	.....	6	300	9 05	0 06
August	76	135	225	90	238	240	4	3	10	250	11 61	0 15
September	76	225	290	65	250	240	4	4	10	250	13 38	0 17

FEED—COST PER CWT.

—	July	August	September
	$ cts.	$ cts.	$ cts.
Grain	2 15	2 30	2 37
Mash	2 00	2 00	2 50
Meat	7 00	5 00	5 90
Grit	1 25	1 25	1 25
Shell	1 50	1 50	1 50
Buttermilk	0 30	0 30	0 30

STORING EGGS

An experiment in storing eggs was carried out in co-operation with the Prince Edward Island Egg and Poultry Association. The plan of the experiment and one case of infertile eggs were supplied by the Experimental Station. The candling, storing, weighing and checking was done by the Candling Station, Charlottetown. These eggs were stored August 24, and taken out of cold storage December 20, 1923. All eggs were graded fresh firsts when stored.

(*a*) Comparing a tight home-made case with regular export case, the result was in favour of the export case.

(*b*) Comparing clean eggs with dirty eggs that were washed, 30 per cent of the washed eggs came out rotten.

(*c*) Comparing clean and soiled fillers, result not conclusive.

(*d*) Comparing Experimental Station infertile eggs with commercial eggs, 99.44 per cent of the Experimental Station eggs came out No. 1, with one cracked and one with blood spots; 91.66 per cent of the commercial eggs came out firsts, and 8.44 per cent seconds.

(*e*) Comparing eggs placed with the small end up in the case with those with the small end down, the result favoured those placed with the small end up.

This experiment will be continued for a number of seasons until definite conclusions can be drawn.

PRINCE EDWARD ISLAND EGG LAYING CONTEST

Summaries of this contest will be published in the forthcoming bulletin covering all the contests conducted by the Dominion Experimental Farms.

BEES

The bees at Charlottetown this year made a creditable showing considering the phenomenal weather conditions during 1923.

The long winter delayed fruit bloom and nectar secretion until late in May, necessitating stimulative feeding for the first week in June, in order to help egg production. A one to one mixture of sugar and water was used for this purpose, feeding about one cupful every evening.

May and June were so cold, dull and rainy that the bees made little increase until July. During the height of the nectar secretion from alsike and white Dutch clover, there were seven consecutive rainy days. This prevented the bees from working, and decreased the honey crop by nearly one-half. The autumn was exceptionally fine for bees. September was rather cool, with heavy rains. October was very warm, having 20 days with the temperature well over 60 degrees F. The bees were first fed for winter on October 2, but on account of the extremely fine weather considerable stores fed were consumed. On October 24, they were again fed in order to bring them up to the required weight for wintering.

WINTERING

Thirteen colonies were wintered outside in 1922-23, in four quadruple packing cases, with movable sides. Twelve of these were 10-frame Langstroth hives, and there was one 10-frame "Jumbo." Cedar planer shavings were used for packing. On account of the severity of the winter two colonies died, and one, strong in bees, was found queenless. The queenless colony was united with a weaker one having a queen. The remaining ten colonies were in only fair strength, the bees covering an average of 5·6 frames when first examined. All colonies were removed from winter packing cases on June 8.

INCREASE

The bees at Charlottetown this year were kept for increase only, honey production being a secondary consideration. Towards the end of June six of the ten colonies were requeened with young vigorous Italian queens. On July 21, six of the parent colonies were divided into three (by taking three frames of capped brood with adhering bees), making two increases from each one. Queens purchased from a commercial beekeeper were used to head these colonies. On July 24, the remaining three colonies were divided in a similar manner, making a total of twenty-seven colonies, and headed by queens from Ottawa. Swarming was controlled by cutting out the queen cells every ten days. Some honey was gathered by the new colonies from the fall flow, three or four frames being partly filled in each colony.

HONEY FLOW

In order to obtain the production of honey at the Charlottetown Station, one colony of average strength was kept on a scales from June 18 until September 18. During this time 117½ pounds of honey were produced. The greatest flow of the season occurred on August 3, when an increase of 10 pounds was recorded. August produced the greatest yield of nectar of any one month, averaging well over 50 pounds. July stood second with 47 pounds. Very little was secreted in June, while September produced only 12 pounds.

Prince Edward Island is particularly fortunate in being entirely free from any bee diseases. It is also fortunate in having two honey crops each year, white honey from the clovers and light amber from golden rod and buckwheat. White Dutch and alsike clover grow in profusion, and 20-acre fields are a common sight in all localities. The clover honey produced grades between water white and white, and has a very mild flavour, being unlike Ontario honey in that there is no definite or sharp clover flavour detected, simply abundance of sweetness. It has splendid keeping qualities, and is readily saleable at good prices.

KIND AND LENGTH OF NECTAR SECRETIONS DURING 1923

Source	Date flow started	Length of flow	Date flow ended
		days	
Willow	May 5	18	May 23
Red maple	" 15	14	" 29
Dandelion	" 28	18	June 15
Fruit bloom	June 13	17	" 30
Clovers	July 1	40	Aug. 10
Lime	" 26	13	" 8
Fireweed	" 28	36	Sept. 2
Buckwheat	Aug. 4	20	Aug. 24
Golden rod	" 25	22	Sept. 17

FEEDING

It is essential on Prince Edward Island to feed an abundance of wholesome stores, to insure against a prolonged winter. On October 2, each colony was fed sufficient stores to carry it through. A two-to-one mixture of pure granulated sugar and water was used. The water was first brought to a boil and then the sugar was added, using two of sugar to one of water, the mixture was stirred thoroughly and allowed to cool to 98° F. Common 5 and 10 pound honey pails were used as feeders, with sixty to seventy small nail holes punched in the covers. The pails were filled and inverted on top of the frames of each colony. In favourable weather the colonies took down 40 pounds each in 24 to 48 hours. In the fall of 1923, sixteen colonies to be wintered outside were placed in 4 quadruple packing cases, and eleven colonies to be wintered inside were placed in the cellar of the Superintendent's residence. Each of the sixteen colonies outside was fed up to 80 pounds, not including the cover. Those to be wintered inside were fed to weigh 75 pounds.

GENERAL NOTES

During the summer all the beekeepers on the Island were visited once by the Farm Beekeeper, and oftener where opportunity afforded. Several new beekeepers started in the spring and had excellent success, securing in some cases over 100 pounds of honey plus a strong increase.

In conclusion, it would appear that the bee population on the Island has been dwindling in recent years. This may possibly have been caused by disease, but the Beekeeper is inclined to think that the lack of sufficient winter stores and of adequate winter protection has been the main cause; this in turn being due to lack of a thorough understanding of bees and their habits. The Island is noted for its clover crops; weather conditions, although not the best, are fair for bees, and there is no reason why every farmer on Prince Edward Island should not keep bees, and by so doing make the Island self-supporting so far as honey is concerned.

DIVISION OF ECONOMIC FIBRE PRODUCTION

THE SEASON

The season was favourable for fibre crops. The spring was late, and there were frequent showers during the growing season. The summer was cool, and the autumn suitable for drying and curing fibre crops.

THE LAND

The fibre tests were laid out along the right hand side of the road going north from the lily pond through the rotations. Plots 9 to 23 were sown to buckwheat the previous year, and the buckwheat ploughed under as green manure. Plots 1 to 8 were on a piece of damp land recently cleared, which was far from uniform or suitable for the purpose. This site was chosen when it was found that the land previously prepared on the Connolly property could not be used for fibre crops.

TEST OF VARIETIES OF FLAX

Five sorts of flax were sown June 6, in duplicate, on 1-40 acre plots. The first seeding was not uniform, and parts of the plots were reseeded.

The plots made vigorous growth and matured fairly evenly. They were harvested during favourable weather, and the entire plants pulled and sent to Ottawa to the Economic Fibre Division for scutching.

The actual yield of undeseeded straw was from 2 tons to 3 tons 1,200 pounds per acre.

DATES OF SEEDING

The dates of seeding in connection with the experiment for fibre production were: June 6, 13, 20 and 27. The plots were all in duplicate, and as the land was uneven, the results of both plots were averaged. When this was done there was little difference between the different sowings, the average of all being about 2 tons 1,400 pounds on undeseeded straw.

MINNESOTA NO. 8 HEMP

The hemp was sown June 6, and did not mature. There was an average yield of only 2 tons of stalks that would average below 5 feet in height.

ILLUSTRATION STATIONS

A full report on the work of the Illustration Stations in Prince Edward Island will be found in the Annual Report of the Division of Illustration Stations in Ontario, Quebec, Nova Scotia, New Brunswick and Prince Edward Island.

EXPERIMENTAL PROJECTS UNDER WAY AT THE EXPERIMENTAL STATION, CHARLOTTETOWN, P.E.I.

ANIMAL HUSBANDRY

DAIRY CATTLE

Project No.	Title
A. 56.	Cost of milk production.
A. 59.	Cost of rearing dairy calves and heifers.
A. 216.	Establishing a herd of dairy cattle.
A. 217.	Cost of maintaining dairy-bred sires.

SWINE

A. 104.	Winter feeding of brood sows.
A. 145.	Cost of rearing pigs to 3 months of age.
A. 147.	Feeding pigs, inside vs. outside.
A. 163.	Cost of pork production.
A. 234.	Establishing a herd of bacon hogs.

HORSES

A. 283.	Feeding work horses.
A. 294.	Cost of rearing horses.
A. 295.	Establishing a stud.
A. 299.	Wintering idle work horses.

FIELD HUSBANDRY

ROTATION EXPERIMENTS

F. 5.	Three-year rotation—Roots; wheat; clover.
F. 14.	Four-year rotation—Potatoes; wheat; clover; timothy.
F. 17.	Four-year rotation—Roots; oats; clover; barley.
F. 29.	Five-year rotation—Potatoes; wheat; clover; oats; clover.
F. 31.	Five-year rotation—Roots; oats; clover; timothy; barley.
F. 45.	Seven-year rotation—Roots; wheat; clover; timothy; timothy; timothy; oats.

CULTURAL EXPERIMENTS

F. 48.	Preparation of land for grain.
F. 52.	Depth of ploughing.
F. 56.	Depth of seeding cereals.
F. 59.	Rates of seeding hay crops.
F. 61.	Rates of seeding and kinds of nurse crops.
F. 64.	Treatment of neglected land.
F. 73.	Depths of laying under drains.

MANURE AND COMMERCIAL FERTILIZER EXPERIMENTS

F. 76.	Quantities of manure and place in rotation of applying manure

FARM MANAGEMENT EXPERIMENTS

F. 88.	Yield and profit from root and silage crops.
F. 90.	Cost of operating tractor.
F. 91.	Cost of producing farm crops.

HORTICULTURE

POMOLOGY

H. 2.	Blackberry, variety experiment.
H. 4.	Currant, variety experiment.
H. 6.	Gooseberry, variety experiment.
H. 11.	Raspberry, variety experiment.

Project No.	Title
H. 21.	Strawberry, variety experiment.
H. 33.	Apple, variety experiment.
H. 35.	Cherry, variety experiment.
H. 44.	Pear, variety experiment.
H. 48.	Plum, variety experiment.

VEGETABLE GARDENING

H. 54.	Asparagus, variety experiment.
H. 58.	Bean, different distances of planting.
H. 57.	Bean, of different seasons, vs. one variety planted at different dates.
H. 61.	Bean, variety experiment.
H. 65.	Beets, different dates of seeding.
H. 67.	Beet, thinning experiment.
H. 68.	Beet, variety experiment.
H. 69.	Borecole or Kale, variety experiment.
H. 70.	Brussels Sprouts, variety experiment.
H. 72.	Cabbage, different dates of seeding for storage purposes.
H. 77.	Cabbage, variety experiment.
H. 80.	Carrot, "Rust Fly" control.
H. 79.	Carrot, different dates of sowing.
H. 82.	Carrot, thinning experiment.
H. 83.	Carrot, variety experiment.
H. 88.	Cauliflower, variety experiment.
H. 90.	Celery, blanching experiment.
H. 94.	Celery, variety experiment.
H. 309.	Citron, variety experiment.
H. 101.	Corn, suckering experiment.
H. 102.	Corn, variety experiment.
H. 106.	Cucumber, variety experiment.
H. 107.	Egg Plant, variety experiment.
H. 116.	Lettuce, variety experiment.
H. 131.	Onion, growing sets.
H. 134.	Onion, seed vs. sets.
H. 136.	Onion, thinning experiment.
H. 137.	Onion, transplanting vs. sown in the open.
H. 138.	Onion, variety experiment.
H. 140.	Parsley, variety experiment.
H. 142.	Parsnip, different dates of seeding.
H. 144.	Parsnip, thinning experiment.
H. 145.	Parsnip, variety experiment.
H. 148.	Pea, different distances of planting.
H. 150.	Pea, of different seasons, vs. one variety planted at different dates.
H. 152.	Pea, supports, vs. no supports.
H. 153.	Pea, variety experiment.
H. 157.	Pepper, variety experiment.
H. 183.	Potato, sprouting experiment.
H. 165.	Potato, distances of planting.
H. 171.	Potato, hill selection for seed.
H. 181.	Potato, selection for shallow-eyed strain.
H. 182.	Potato, spraying experiment.
H. 188.	Pumpkin, variety experiment.
H. 192.	Radish, variety experiment.
H. 194.	Rhubarb forcing.
H. 195.	Rhubarb, variety experiment.
H. 193.	Rhubarb, breeding.
H. 197.	Salsify, variety experiment.
H. 199.	Spinach, variety experiment.
H. 201.	Squash, variety experiment.
H. 207.	Tomato, methods of training.
H. 211.	Tomato, variety experiment.
H. 214.	Turnip, variety experiment.
H. 216.	Vegetable marrow, variety experiment.
H. 218.	Vegetable seed, autumn vs. spring sowing.

ORNAMENTAL GARDENING

H. 261.	Annuals, variety experiment.
H. 274.	Herbaceous perennials, variety experiment.
H. 307.	Trees and shrubs, ornamental and shelter, variety experiment

CEREALS

Project No.	Title
Ce. 1.	Common spring wheat, test of varieties or strains.
Ce. 5.	Oats, test of varieties or strains.
Ce. 6.	Barley, test of varieties or strains.
Ce. 7.	Field peas, test of varieties or strains.
Ce. 9.	Flax, test of varieties or strains.
Ce. 13.	Common spring wheat, production of superior varieties or strains by selection from old sorts.
Ce. 17.	Oats, production of superior varieties or strains by selection from old sorts.
Ce. 18.	Barley, production of superior varieties or strains by selection from old sorts.
Ce. 50.	Multiplication of cereals.
Ce. 52.	Determination of percentage, hull in oat varieties.
Ce. 55.	To study the natural crossing of barley.
Ce. 74.	Investigation of methods of obtaining accurate data in variety testing.

FORAGE PLANTS

Ag. 1.	Indian corn, variety tests for ensilage purposes.
Ag. 16.	Mangels, variety tests for yield and purity.
Ag. 17.	Mangels, breeding of pure strains.
Ag. 36.	Carrots, variety tests for yield and purity.
Ag. 51.	Swedes, variety tests for yield and purity.
Ag. 55.	Swedes, testing clubroot-resistant varieties.
Ag. 66.	Sugar beets, variety tests for yield and purity.
Ag. 76.	Sunflowers, variety tests for yield and purity.
Ag. 146	Red clover, variety tests for yield and general suitability.
Ag. 161.	Sweet clover, variety tests.
Ag. 201.	Timothy, variety tests for yield and purity.
Ag. 231.	White dutch clover, variety tests for yield and suitability.
Ag. 258 (D)	Hay and pasture mixtures experiment—Red clover as a base.
Ag. 258 (E)	Hay and pasture mixtures experiment—Mixed clovers as a base.

CHEMISTRY

C. 1.	Sources of lime experiment.
C. 2.	Fish scrap fertilizer experiment.
C. 3.	Sources of nitrogen experiment.
C. 4.	Nitrate of soda applied at different times—1923.
C. 5.	Intensive growing of potatoes experiment—1923.
C. 10.	Sugar beet investigation.
C. 11.	Agricultural meteorology.
C. 26.	Basic slag experiment, 1923.

POULTRY

P. 1.	Best make of incubator (Prairie State-Buckeye-Tamlin-Cyphers).
P. 3.	Best date for incubation.
P. 6.	Moisture in incubator.
P. 12.	Hatching results by breeds. (B.R. & W.L.).
P. 17.	Natural vs. artificial incubation.
P. 18.	Best type of brooder.
P. 23.	Artificial vs. natural brooding.
P. 55.	Methods of handling for egg production.
	Exp. (*a*) Confinement vs. range.
	Exp. (*c*) Effect of size of pen.
P. 56.	Pedigree breeding for egg production.
P. 58.	Best hatching date for egg production.
P. 60.	Pullets vs. hens for egg production.
P. 61.	Comparison of breeds for gross egg production. (B.R. & W.L.).
P. 62.	Costs of egg production.
	Exp. (*b*) Winter months. (W. Leghorn).
	Exp. (*b*) Winter months. (B. Rocks).
P. 76.	Standard (home-mixed) vs. commercial grain.
P. 79.	Standard (home-mixed) vs. commercial mashes.
P. 84.	Buttermilk vs. beef scrap.
P. 111.	Breeding for fertility, hatchability and livability.
	Exp. (*a*) Hens vs. pullets.
P. 148.	Profits from poultry flocks. (W. Leghorns, B. Rocks).

APIARY

Project No.	Title
Ap. 7.	Wintering in cellar.
Ap. 8.	Wintering in 4-colony cases.
Ap. 14.	Study of alsike and Dutch clover.
Ap. 16.	Study of minor honey plants.
Ap. 20.	Returns from apiaries.
Ap. 21.	Comparison of different sizes of hives.
Ap. 28.	Study of honey flows.
Ap. 30.	Outdoor versus cellar wintering.
Ap. 34.	Queen rearing.

ECONOMIC FIBRES

E. 3.	Testing varieties of flax.
E. 4.	Testing varieties of hemp.
E. 7.	Seeding tests, sowing flax at different dates.

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