DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
DOMINION EXPERIMENTAL FARMS

DIVISION OF ILLUSTRATION STATIONS

PROGRESS REPORT

1934 TO 1937

PART I

PRINCE EDWARD ISLAND, NOVA SCOTIA, NEW BRUNSWICK, QUEBEC AND ONTARIO

J. C. MOYNAN, B.S.A.
Chief Supervisor

Published by authority of the Hon. JAMES G. GARDINER, Minister of Agriculture,
Ottawa, 1938

TABLE OF CONTENTS

PROGRESS REPORT OF ILLUSTRATION STATIONS

1934–1937

INTRODUCTION

There are 183 illustration stations in operation in the Dominion. In 1935, under the provisions of the Prairie Farm Rehabilitation Act, the illustration stations operating in the southern portions of Manitoba, Saskatchewan and Alberta, coming within the drought areas, were reorganized on a strip-farming basis, expanded to cope with soil drifting, and renamed District Experiment Sub-stations. At the present time there are 47 of these stations dealing with the problems of drought and soil drifting. Thus, 239 districts are being served and 113 phases of practical agriculture and local community farm problems taken under review. Operating on privately owned farms in co-operation with the Experimental Farms Branch, 14 stations are located in Prince Edward Island, 17 in Nova Scotia, 20 in New Brunswick, 51 in Quebec, 17 in Ontario, 17 in Manitoba, 51 in Saskatchewan, 24 in Alberta, and 19 in British Columbia. This report deals with the work in the eastern provinces of Ontario, Quebec, New Brunswick, Nova Scotia and Prince Edward Island.

Systematic Layout, the Basis of Illustration Station Farm Improvement

Since the establishment of the first illustration stations in the eastern provinces 21 years ago, a great deal of information has been assembled on crop rotations and their practical application. Early work, relating to the study of rotations and cropping programs, was carried out on small fields fronting on the highways and main travelled roads, in communities experiencing farming problems and distantly removed from the experimental farms. In the process of clearing and developing farms, it is but logical to find that the original field boundaries do not permit the best possible layout for efficiency in tilling or cropping. Too frequently also, fields adjoining the barns receive more than their share of the manure, while back fields, including pastures, are in an undesirably low state of fertility.

During the four-year period 1934-37, a concerted effort has been made to apply, on farms operating as illustration stations, the principles established in earlier years, and to disseminate this information amongst the farming communities surrounding these stations. As a result, in co-operation with the 119 illustration station operators in the provinces of Ontario, Quebec, New Brunswick, Nova Scotia and Prince Edward Island, their farms have been measured and a reorganized plan worked out for future development. This plan provides for a suitable crop rotation or rotations, and forms the basis for soil and crop improvement work.

The two accompanying diagrams illustrate how the plan is being worked out on the farm of Mr. A. Vachon, Laurierville, Que., on which farm illustration station work was established in 1928. In the diagram to the left will be noted the original layout and the location of the farm fences when the work was started. On the right is the reorganized layout in the process of development.

When organizing a farm, it is essential to determine the tillable acreage as well as that in permanent pasture. Naturally, obstacles such as stony, rough or wet land not capable of being drained, must be appraised. When the acre-

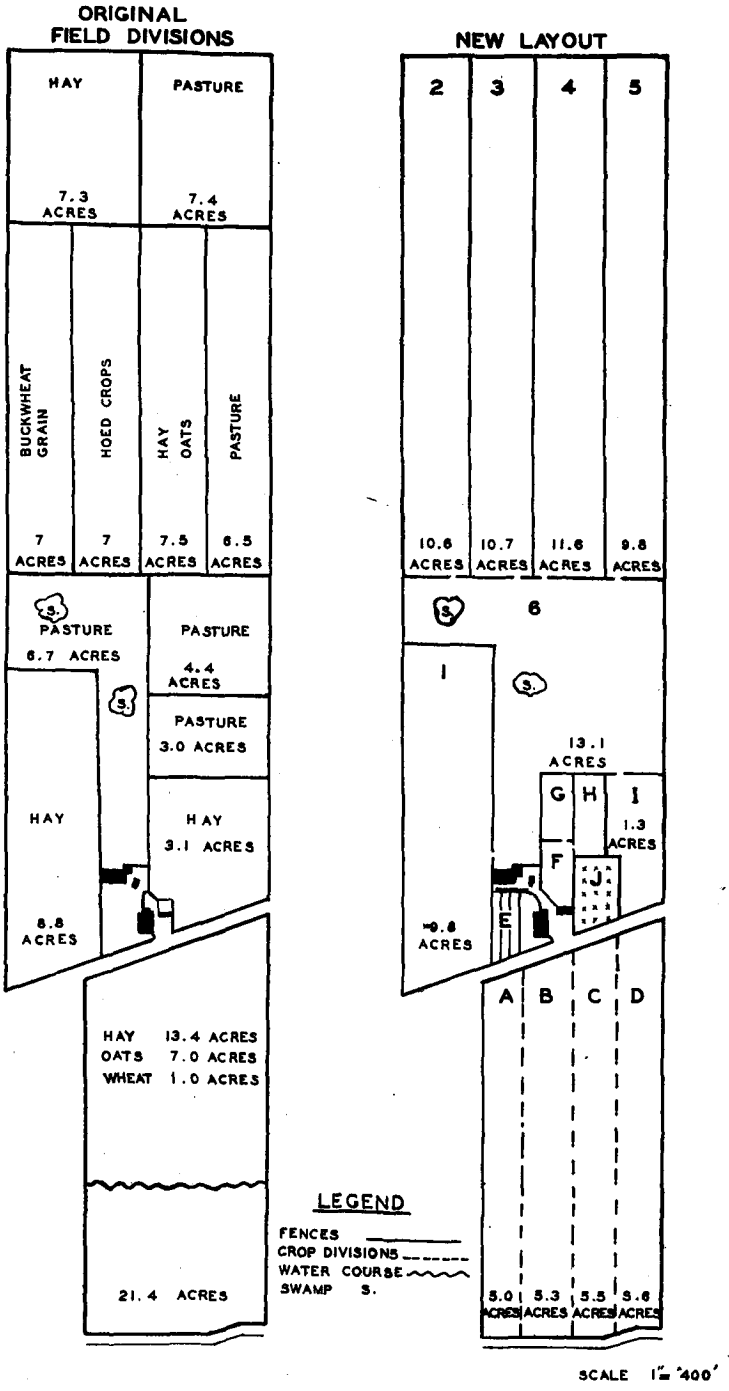


ILLUSTRATION STATION: LAURIERVILLE, QUE.
OPERATOR: ACHILLE VACHON

age under crop is relatively small in proportion to the pasture, it is necessary to decide the size of the unit which is to be developed, and the area of pasture land which will be broken up and brought into the cropping program. The latter is important in a diversified type of farming, as the unit should be large enough to carry a sufficient number of cows, hogs, poultry and cash crops to provide the revenue necessary to meet taxes, purchase equipment and machinery, maintain the home, meet operating expenses, and yield a labour income for the owner. On many farms there are low, poorly-drained areas not well suited to the growing of potatoes, corn, turnips or mangels, but which are better suited to the production of hay and grain. On the farm under review, a river marks the southern boundary. With the spring freshet this river rises, flooding the tillable land adjacent to it, making it late to plant and thus not suited to the growing of hoed crops. When a farm has a fairly wide frontage, so that the field divisions may be laid off from a central laneway, a desirable type of farm rotation layout is provided. In practice, however, it is essential to develop the plan in keeping with the shape of the farm and existing conditions on each holding. On this farm it was found advantageous to lay down two rotations, one of four, the other of five years duration.

On fields "A," "B," "C" and "D," a four-year rotation in which the crop sequence of grain, grain seeded down, clover hay, and mixed hay is being developed. On the higher, better drained and earlier soils, as on fields "1," "2," "3," "4" and "5," a five-year rotation is being established, in which the crop sequence is hoed crops, including potatoes, corn, roots; grain seeded down; clover hay; mixed hay; and timothy. Field "6" is rough, wet, stony land difficult to drain and provides permanent pasture, a portion of which has been improved with a 600-pound application of 0-16-6 chemical fertilizer. Fields designated as "E" are poultry runs operated in three sections, one of which is seeded to grasses and clovers each year. Fields "F," "G" and "H" adjoin the hog pens and provide yards operated on a three-year rotation basis, in which the crop sequence is rape, oats and peas seeded to grasses and clover, clover as pasture for the hogs. Field "I" is used as a calf pasture, and by opening a gate access is provided to the permanent pasture. "J" is the home orchard in which hardy varieties of apples and plums are tested. This diagram illustrates some of the natural obstacles encountered when laying out a farm, and how under existing circumstances ready access is provided to the rotation fields. From this central pasture it is possible, by opening gates, to permit the stock to graze the aftermath on any of the five-year rotation fields during the late summer or fall, when pastures frequently are less productive due to a period of low rainfall.

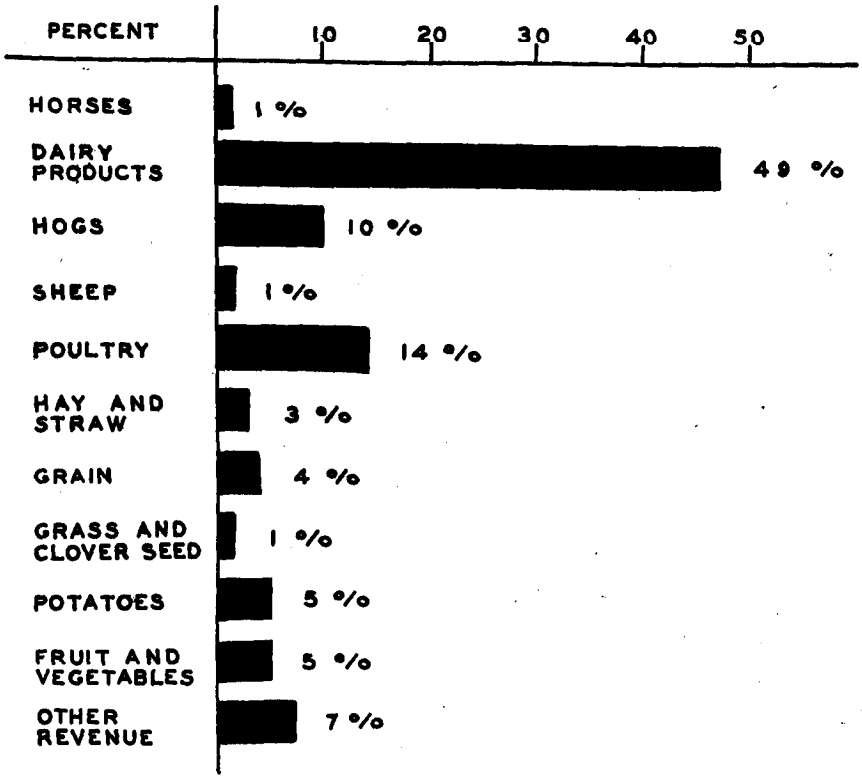
Comparative tests and fact-finding phases of illustration station work are linked up with this organized farm layout, three acres of land being set aside for such special trials in each of the rotation fields. These tests deal with local problems of production, including the adaptation of newly originated varieties to the district, economical fertilizing practices where the supply of manure is limited and not sufficient for the hoed crop land, need and effect of ground limestone on legume crops, control of brown-heart and club-root in turnips, pasture improvement by fertilization, etc. By having these tests developed in harmony with the farm cropping procedure, it is possible to observe their effect on the crops to which they are applied, as well as on succeeding grain, clover and timothy hay crops.

Such a program of improvement provides a systematic farm organization on which to build up the needed farm revenue, by supplying suitable succulent feed, legume hay, home grain concentrates and productive pasture for the feeding of the dairy herd, hogs, and poultry, also for the utilization of some of these crops for the production of clover seed, timothy seed, peas, potatoes, table turnips and seed grain as cash crops. To improve a farm, including the

modernizing of the buildings, beautifying the home and surroundings, and at the same time do it from yearly revenue, is a long-period project. By working to a carefully prepared plan, each season's accomplishments, even though modest, will contribute to the program of improvement, and according to the experience obtained on the illustration station, this stimulates interest, increases farm revenue, and makes for greater pride and permanency in farming.

Sources of Farm Revenue

Farm management studies were carried out in 1937 on 98 farms in the eastern provinces, which are being operated as illustration stations. In this connection the cash receipts were recorded and classified in such a way as to indicate the extent to which each enterprise was developed and contributed to the gross annual revenue. In addition to produce used for maintenance of the different members of the household, the average cash receipts per farm amounted to $1,545.13. In comparison with the average cash receipts, it was found that ten of the most successful farms in this group disposed of farm produce to the value of $4,866.64 and that the ten lowest took in $290.36 per farm. While it is true that of the latter number three were in recently established farming districts, it was apparent that, in the past, some have failed to appreciate the importance of developing a farm organization which will provide sufficient volume of sales to meet necessary expenditures such as taxes, hired help, repairs, machinery, insurance, groceries, and labour return to the owner.



Per cent contributed by established revenue producing lines to cash receipts, taken as an average of 98 farms operating as illustration stations in the eastern provinces.

From the chart it will be noted that of the total receipts on these 98 farms, 49 per cent came from the sale of dairy products, 1 per cent from horses, 10 per cent from hogs, 1 per cent from sheep, 14 per cent from poultry, 3 per cent from hay and straw, 4 per cent from grain, 1 per cent from grass and clover seed, 5 per cent from potatoes, 5 per cent from fruit and vegetables and 7 per cent from other miscellaneous sources.

On the farm having the highest volume of sales, which totalled $7,775.79, fruit and vegetable sales amounting to $3,921.53 made the greatest contribution to the revenue, that from dairy produce ranking second. It was similarly found on the farms having the highest revenue that the owners were developing a strong cash sideline closely co-ordinated with their dairy undertakings. Such cash sidelines included poultry, hogs, silver foxes, fruit, vegetables including cabbage, turnips, cauliflower, carrots, potatoes as table stock and certified seed, grasses and clover seed. Due to the unusually high loss of clover stands, resulting from winter killing in 1937, sales from clover seed were much below normal. Studies thus far pursued have indicated, to the station operators and neighbouring farmers, the limited extent to which some of them have developed promising enterprises which would add to their farm revenue. In other cases it is important that the tillage acreage be enlarged by clearing, or by bringing into the farm rotation unproductive pasture land, with the object of increasing the volume of sales and farm business in general.

Illustration Stations as Seed Centres and the Introduction of New Varieties

Growth of crops from pure seed varieties adapted to each station district has been encouraged. Over the four-year period 1934-37, from the farms operating as illustration stations, seed grains to the amount of 155,950 bushels, grass and clover seed to the amount of 204,747 pounds, and potatoes for seed purposes to the number of 25,402 bushels, have been sold for use as seed, to farmers in the localities surrounding illustration stations. In 1935 there were 1,308 and in 1937, 1,125 farmers who purchased seed from the station operators in the different provinces. In certain specialized crop districts, it frequently occurs that there is not sufficient local sale for the seed produced and substantial quantities are shipped to other areas.

As an outgrowth from tests carried out on the stations in the Maritime Provinces, a recent development has been the growing of Wilhelmsburger turnip seed, a variety highly resistant to club-root, by J. L. Clark, Rustico, P.E.I., and John Corning, Yarmouth, N.S. In Manitoba the station operators have co-operated with the experimental farm in the multiplication of Renown wheat, a new rust tolerant variety.

Live Stock Improvement and Sales of Breeding Stock

Improvement of the dairy herds on the illustration stations is approached from the angles of better feeding and breeding, and systematic weeding out of the low producing individuals in the herd, on the basis of individual milk records and general health. During the period 1934-37, the tuberculin testing of herds has expanded, and at the close of 1935, 104 herds were on the accredited herd system. The blood testing of the poultry flocks for pullorum is an active station project, being carried out on all stations where it is practical to make this test. The development of this project has been made possible with the co-operation of the poultry workers at the different experimental farms and provincial officers in charge of this activity. The sales of breeding stock by operators over a four-year period, amounted to 1,092 head of cattle representing the different breeds kept on the stations; 1,691 hogs of Yorkshire breeding; 432

sheep; 184 black foxes; 3,675 cockerels, 3,487 pullets, 5,730 baby chicks, and 21,790 settings of eggs. The increase in sales of eggs for hatching in 1936-37, over the years 1934-35, was 237 per cent. The first sales of stallions by illustration station operators were made in 1937.

Illustration Station Field Days and Co-operative Efforts

Acquainting neighbouring farmers with the results of the work being carried out on the local illustration station is an essential and actively pursued undertaking. With this in mind, Field Days are held on the stations during the growing season, in order that those present may observe and discuss with the departmental officers the program of work under way, observe the response of crops to different cultural, manurial and fertilizer treatments, and in so doing become more thoroughly acquainted with the results, so that successful and practical procedures may become more generally applied throughout the community.

Inspection of crops, studying results of comparative trials, and discussion of district problems are features of the illustration station field day.

In 1934, 152 Field Days were held on illustration stations with an attendance of 20,320 or an average attendance of 135. In 1935, 147 meetings were held with 16,149 or an average of 110 persons present. In 1936, 139 meetings were held with 17,974 in attendance, or an average of 129 per meeting. In 1937, 164 meetings were held with 23,482, or an average of 143 persons per meeting in attendance.

In arranging for these meetings, the Supervisors have been assisted by the local provincial Agricultural Representatives, and by specialists from the experimental farms who discussed important phases of the work in which they were engaged. In turn the Supervisors have assisted the Agricultural Representatives at short courses, judging at ploughing matches, and agricultural exhibitions.

REPORT OF THE ILLUSTRATION STATIONS FOR PRINCE EDWARD ISLAND 1934 TO 1937

E. L. Eaton, M.S.A., Supervisor

The original purpose of the illustration stations in Prince Edward Island was to bring to the attention of farmers the useful facts learned by the Experimental Farms System. They have also served as testing grounds for new varieties, and in more recent years have become experimental areas for the study of cultural methods and various soil treatments. In many instances they deal with specific and localized problems which demand careful study. The stations also serve as local sources of good seed and as breeding centres for improved poultry and live stock.

In Prince Edward Island there are now 15 illustration stations, 14 of which deal with general farm problems and one with the special study of cranberries.

The locations of the stations and the names of the operators are as follows:

Station	*Operator*
Alberton	Lester and Heber Profitt
Alliston	T. Albert Hicken
DeSable	Hector MacKay
East Point	Fred Cheverie
Glenwood	Mrs. George MacIsaac
Iona	James E. Daly
Montague	Fred G. MacIntyre
New London	William E. Johnstone
Palmer Road	Sylvain Peters
Red Point	Nelson R. Stewart
Richmond	Thomas Noonan
Rose Valley	John W. MacKenzie
Rustico	John L. Clark
St. Peters	Clifford McEwen
Wood Islands	Mrs. Sarah Matheson and Sons

The farms are owned by the operators and it is they who actually conduct the demonstration. Their valuable suggestions, painstaking labour, aid in interpreting results and keen interest in conveying the information to the community, are largely responsible for the measure of success attained.

Description and Organization of Station Farms

ALBERTON, PRINCE COUNTY

Lester and Heber Profitt, Operators

This station, located in the spring of 1936, presented a major problem in farm layout. The original farm lot was 50 acres, to which had been added two other 50-acre lots all on one side of the highway. In the new plan a central lane, 20 feet wide, was run from the buildings to the rear, three uniform-size fields laid off on each side of this line, with a small permanent pasture near the buildings and a larger permanent pasture in the rear. The farm is fairly level, but is marred by several low spots where drainage, while needed, is difficult. A six-year rotation is being established in which the crop sequence will be: Grain; roots, including corn, potatoes and supplementary crops; grain; clover hay; timothy hay; timothy hay or pasture.

A silo is in use on this station, and pure-bred Holstein cattle, Shropshire sheep, Yorkshire swine and Barred Rock fowl have been consistent winners at

the Prince County Exhibition at Alberton. Steps are being taken to establish registered cereals, peas and swede seed. Changes in the location of some of the smaller buildings and construction of a picket fence around the barn yard have made a great improvement in the appearance of the front. The first field day was held on this station in 1937.

ALLISTON, KINGS COUNTY

T. Albert Hicken, Operator

This station, in southern Kings county, was established in the spring of 1935. The area under study includes two farms, the co-called "home farm" consisting of eight acres of cleared land, upon which are located the farm buildings and a stony wood lot, some small portions of which are tillable; and a newly purchased farm consisting of 30 acres of tillable land and 50 acres of rough pasture and waste land. The soil in this farm and in the surrounding district is below average in fertility. At the outset the farms were divided into a five-year rotation, using six-acre fields, with the home farm as one of these. In addition to the regular rotation fields, a six-acre field has been cleared for permanent pasture, and additional land is being cleared for potatoes as the liming program introduces the hazard of scab in the rotation fields. Ample space is left for garden, orchard and poultry yard.

The crop sequence will be: Grain, probably oats; hoed crops and supplementary crop; grain—wheat and barley seeded to grass and clover; clover hay; timothy hay.

The station is proving a valuable addition to the neighbourhood. Registered cereals, certified and tuber unit seed potatoes, Guernsey cattle and Barred Rock poultry are maintained.

DESABLE, QUEENS COUNTY

Hector MacKay, Operator

The station at DeSable was established in 1931. The location is on the main road between Borden and the Rocky Point Ferry, and only a few chains off the direct Borden-Charlottetown highway. The farm is on both sides of the highway, extending to the shore. Good seed, a well prepared seed bed, thorough care throughout the season and large, clean crops are the standard usually achieved on this station. Dual-purpose Shorthorn cattle and Barred Rock hens are kept. A five-year rotation has been established consisting of: Hoed crop; grain; clover; timothy; pasture. No provision has been made at this station for a permanent fertilized pasture, but certain other land is available for this purpose.

EAST POINT, KINGS COUNTY

Fred Cheverie, Operator

This station was established in the fall of 1937 for the specific purpose of studying the problems of cranberry production under the dry land conditions of the province. The initial study will be from three angles: (1) Sanding (2) turfing (3) salting. Insect control will also receive attention.

GLENWOOD, PRINCE COUNTY

Mrs. George MacIsaac, Operator

This station was established in the fall of 1927 and in earlier reports was referred to under the name of Alfred E. Gorrill. Mr. Gorrill's death was a distinct loss to the work, but Mrs. Gorrill, more recently as Mrs. MacIsaac, has continued the work with the aid of two sons who have not yet passed the school age.

This farm is not large and a natural watercourse mars the shape, but it has been tilled very carefully and is particularly noted for the heavy crops of all kinds which it has produced. A number of improvements have been made in the farm buildings in recent years; the hog and poultry houses moved and renovated; a concrete floor placed in the horse stable; and a new milk house and separator room adjoining the barn built. Dairy products, hogs, poultry and cash crops provide the farm revenues.

A five-year rotation of: Grain; hoed crops; grain; clover; timothy, is used. This, with two permanent pasture fields each with ample water, makes a compact unit all within easy distance of the buildings.

IONA, QUEENS COUNTY

James E. Daly, Operator

This station, established in 1923, has undergone extensive alterations in the farm layout. In the future all of the fields will border on a central lane. On one side will be three fields in permanent pasture and an orchard, on the other side six fields of six and one-half acres each. Limestone is being applied to each of these fields and a special effort made to produce clover and alfalfa. At the rear of the farm is an area of more than 40 acres which will be devoted to the growing of potatoes in a separate rotation.

This farm was originally very low in fertility and soil improvement has been a tedious process. Nevertheless definite progress has been made and in 1937 one of the finest fields of mixed clover and alfalfa hay in the province was grown on this farm. The second crop on this field was saved for seed and a splendid sample threshed.

In 1936 a new pig house 40 feet by 24 feet was built and better facilities provided for turning cull potatoes into pork.

Guernsey cattle, Barred Rock poultry, certified and tuber unit potatoes are raised.

A highly interesting series of experiments on brown-heart of swedes was conducted in 1937 by the laboratory of plant pathology, Charlottetown.

MONTAGUE, KINGS COUNTY

Fred G. McIntyre, Operator

The station at Montague was established in 1923, and is well located on both sides of the highway. An area of 56 acres has been split into six fields, three on each side of the road, on which a six-year rotation will consist of: Grain; hoed crop; grain; clover; timothy; timothy. An area of 14 acres has been set aside for rotational pastures, each having access to water. These pastures have received different treatments. One received annual applications of complete fertilizer for the past six years and has provided twice as much pasture as the check. The second received one ton of limestone in the fall of 1935 and 475 pounds of 20 per cent superphosphate the following spring. The third received the limestone alone and the fourth serves as a check.

In addition to the regular rotation fields on which limestone at the rate of one ton per acre is being used, there is a large area at the rear of the farm where potatoes may be grown in rotation and where lime will be avoided.

This is a farm on which real progress in soil building has been made. In the earlier years a large dairy herd was maintained, but later the growing of certified seed potatoes received more attention. The supply of humus built up during the early years provided a splendid reserve which was drawn on in producing many fine crops of potatoes. Now more attention is being given to a mixed farming program. Ayrshire cattle and White Leghorn hens are kept.

NEW LONDON, QUEENS COUNTY

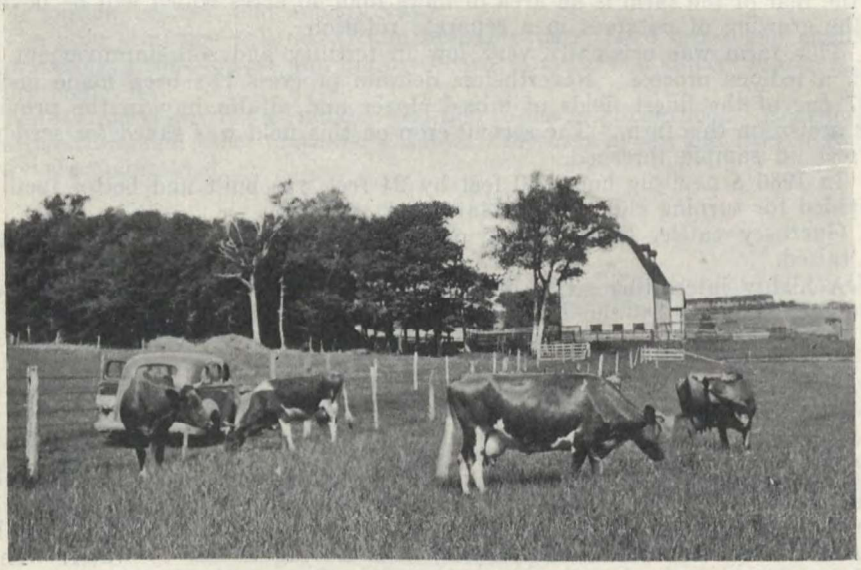
William E. Johnstone, Operator

The station at New London was established in 1928 and has 125 acres under cultivation. The general contour of the farm is hilly and as much of the land is at a distance from the buildings, two distinct six-year rotations have been set up. This farm received generous applications of mussel mud many years ago, the response to which is recorded in the large yield of farm crops which the farm has produced, enabling larger quantities of manure to be returned to the soil. This farm has become an important community centre. Two hundred and fifty people were present for the 1937 field day.

The first rotation is used on those fields near the buildings and consists of: Grain; hoed crops and supplementary crops; grain; clover hay; timothy hay; timothy hay or pasture.

The second rotation is used on the more remote fields and includes: Grain; grain; clover hay; timothy hay; pasture; pasture.

In addition, two small fields have been set aside for permanent pasture, one fertilized, the other as a check. Guernsey cattle are kept, and the operator is an outstanding breeder and exhibitor of silver black foxes.



Guernseys on fertilized pasture on the farm operated as an illustration station at New London, P.E.I.

PALMER ROAD, PRINCE COUNTY

Sylvain Peters, Operator

This station, established in 1927, has shown definite progress in both appearance and crop yields. The home farm is now all included. The old station forms two fields, which with four others provide for a six-year rotation. The top soil on this farm is underlaid with a heavier subsoil, making it later to work in the spring than that on any of the other stations. Consequently early varieties of cereals have shown their superiority in trials here, and are becoming more widely sown in the surrounding district.

An Ayrshire bull is kept and progress has been made in grading up the dairy herd.

In 1936 an up-to-date poultry house for 40 birds was built. A small brooder house was erected in the spring of 1937 and a brooder stove purchased. A section was added to the barn in 1936 and a straw shed added in 1937. The stable is now rearranged with concrete floor under the cattle.

A feature in the soil building program on this farm has been the use of kelp, lobster bodies and herring spawn from the nearby shore. Barred Rock hens are kept.

RED POINT, KINGS COUNTY

Nelson R. Stewart, Operator

This station was established in 1927 and is managed with a minimum of help. The farm is rather long and narrow and does not lend itself to the most convenient layout, but the clean fields and good crops are a tribute to the careful work of the operator. The farm lies on both sides of the highway and unfortunately the permanent pasture is on the side of the road away from the buildings. The other fields have been taken into a five-year rotation which seems to be working satisfactorily. The rotation consists of: Grain; hoed crop; grain; clover hay; timothy hay. In the permanent pasture two areas were seeded in the spring of 1935, one to the regular clover-timothy mixture, the other with a permanent pasture grass mixture. Both areas were in one field and animals grazed at will on the two portions in 1936 and 1937. In the latter year a decided preference was shown for the clover-timothy portion, and more wild white clover has appeared.

The buildings have been much improved in recent years. In 1934 a new workshop and granary was built and in 1936 a large addition was made to the present dairy and horse barn. Ayrshire cattle and Barred Rock hens are kept.

RICHMOND, PRINCE COUNTY

Thomas Noonan, Operator

This, the oldest existing station in Prince county, was established in 1924. The farm is ideally located on the Western road about one mile south of Richmond village and is composed of two blocks of land together shaped like the letter L. To date a definite rotation has not been worked out for this station, but the policy of reserving a portion of the land without lime for potatoes is receiving consideration.

The station has given many clear-cut results with commercial fertilizer on hoed crops and with nitrogen fertilizers on timothy. Several of the fields in this farm received mussel mud a number of years ago and have produced excellent crops of hay and clover. At the same time scab on potatoes has become a problem, but has been overcome the past two years by deep ploughing. Evidently the fresh subsoil has furnished a layer of soil in which the potatoes could develop without coming in contact with the scab organism. Although on the margin of a late soil district, the variety Victory has yielded a satisfactory crop of oats in nearly every season. The year 1937 was an exception in this regard and late-sown oats received severe injury from drought and leaf rust.

Mr. Noonan is a leading breeder of silver black foxes. Barred Rock hens are also kept.

ROSE VALLEY, QUEENS COUNTY

John W. MacKenzie, Operator

This station was established in 1923, under the care of the present operator's father. For several years prior to the death of Mr. MacKenzie, senior, the active farm operations were under the direction of the son, so that no break has occurred in the change of listing. As the farm parallels the highway, no farm lane is

needed and the six 10-acre rotation fields all open directly on the road. The sequence of crops in these fields is: Grain; hoed crop; grain; clover; timothy; timothy or pasture. In addition to this a 14-acre field is being used for permanent pasture, and five different treatments were given in the spring of 1936 as follows:—

Plot 1—One ton ground limestone per acre.
Plot 2—One ton ground limestone per acre plus 600 pounds superphosphate.
Plot 3—Eight tons mussel mud per acre.
Plot 4—Check plot.
Plot 5—Complete mixture—150 pounds sulphate of ammonia, 250 pounds superphosphate (20 per cent), 100 pounds muriate of potash.
Plot 6—Complete mixture as in No. 5, plus 1 ton ground limestone.

In 1937, plots 5 and 6 each received a further application of 75 pounds sulphate of ammonia, 125 pounds superphosphate (20 per cent), and 75 pounds muriate of potash. Natural variations in the soil have made sampling of these plots rather difficult, nevertheless some interesting differences are showing.

RUSTICO, QUEENS COUNTY

John L. Clark, Operator

This farm, established in 1924, has long been rated one of the best all-round farms in the province. The soil has been brought to a high state of fertility by careful management and full use of all the barnyard manure produced. Live stock have been consistently featured as a means of turning farm crops into cash. Pure-bred Holstein cattle, Yorkshire swine and Barred Rock poultry are of a quality seldom excelled.

Seven fields of nine to ten acres each have been set aside for a rotation. The sequence is similar to the usual five- or six-year rotation, but will provide two or three years of pasture at the end of the series. In addition, 15 acres of permanent pasture have been laid down.

For several years a club-root garden was maintained, in which different varieties of swedes were tested for resistance. In these trials the superiority of the Wilhelmsburgher variety has been thoroughly established. A small quantity of seed of this variety has found a ready sale, but the operator finds it impossible to add swede growing to his already full farm program.

ST. PETERS, KINGS COUNTY

Clifford McEwen, Operator

The station at St. Peters was established in 1923, and extends on both sides of the highway. The farm is long and narrow and a side lane from front to rear is necessary. The soil is not naturally fertile, but has been brought to a high level of productivity by many years of careful management. This station was first operated by the father and during the second half of the period by the son. The station has always been rather outstanding for the quality of its Clydesdale horses, Shorthorn cattle, Oxford sheep and silver black foxes. Barred Rock hens are also kept.

The farm has been laid off into a seven-year rotation with an area of permanent pasture, similar in a general way to the plan at Rustico. Excellent stands of alfalfa-clover-timothy mixtures have been secured, and the hay crop in 1937 was extremely heavy.

WOOD ISLANDS, QUEENS COUNTY

Mrs. Sarah Matheson and Sons, Operators

This station was established in 1927 by the late Alexander Matheson, and since his death, early in 1937, has been continued by Mrs. Matheson and her three grown-up sons. A large amount of work has been done on the farm the past summer by the young men. The soil on this farm is the lighest of any of the stations, and was badly depleted of its humus in the past. The late operator was keenly interested in lime, and the fertility of the land is being restored through the combination of lime, legumes and live stock. A beautiful crop of mixed clover and alfalfa was cut this year, and the sons are ambitious to develop all the land to the same fine condition. Five ten-acre fields have been measured and will be worked under a five-year rotation of: Grain; hoed crop; grain; clover hay; timothy hay. There is ample other land for pasture and potatoes.

An extensive experiment in control of brown-heart of swedes was conducted in 1936. The residual effect was studied in 1937, but the drought prevented any useful data being secured from the cereal portion of the plots. This project was carried on in collaboration with the Maritime and Central Committees on the control of brown-heart.

The Ayrshire bull, Charlottetown Rare Gold 10th —18436— A.R. No. 2638, Class A, was purchased in the fall of 1936 and has been used for service in 1937.

Sales of Seed from Illustration Stations

The following figures record the quantities of small seeds sold in the past four years by 13 operators:—

SALES OF SEED

Year	Seed Grain	Potatoes	Grass and Clover	Number of farmers buying
	bush.	bush.	lb.	
1934	881	1,820	2,344	65
1935	1,570	605	1,280	83
1936	1,458	2,315	2,207	91
1937	1,617	4,456	2,915	131

It is evident from these records that the illustration stations are serving a useful purpose as local sources of good seed.

Field Days

A large amount of thought has been given to the Field Day programs on the illustration stations of the province. During the early years of the stations the attendance was relatively small but recently a gratifying increase in the number present is recorded.

In 1934 a total of 1,830 people attended the 13 field days. The field day at Rustico was combined with the annual field day of the provincial Holstein-Friesian breeders, thereby more than doubling the usual attendance. A truck exhibit dealing with: (1) Weeds and Weed Control, (2) The Hog Testing Station and (3) The Experimental Farm System, was shown and discussed at each place. A live stock demonstration was given at Palmer Road, New London, Rustico, St. Peters and Red Point.

In 1935 there were 1,335 present at the 13 field days. A truck exhibit on: (1) Feeding Baby Chicks, (2) New Hog Grading Regulations, (3) Treating Seed Grain for Smut and (4) List of Selected Fruits and Vegetables, was shown and addresses given centering around these. Fox breeding problems were also discussed at appropriate places.

The 1936 attendance reached an all-time high when 2,295 people gathered. Following the ploughing demonstration at Charlottetown, similar demonstrations were given at the Glenwood and St. Peters Field Days. Horse judging demonstrations were put on at Alliston, Montague and Wood Islands. A most educative insect collection from the entomological laboratory, Fredericton, was shown at each field day. Plots sown from local farmers' seed grain were of special interest at Alliston, Palmer Road and Rustico.

The number present at the 1937 field days totalled 1,314. The new station at Alberton held its first field day and the program there, with slight variations, was typical of all. The following points were discusesed during a tour of the fields:—

(1) Farm planning and rotations as newly established on the station.
(2) Potato diseases and the tuber unit method of control.
(3) Varieties of field roots and cereals and fertilizer treatments on various crops.

Lectures were later given on:—

(1) Poultry production and rearing.
(2) Federal cattle policies.
(3) The history and organization of illustration stations.
(4) Fertilized pastures.

A dairy cattle demonstration concluded the day.

At Red Point a ploughing demonstration was given. At St. Peters, Rustico and Rose Valley the live stock program took the form of a horse judging demonstration, and special fox problems were discussed at Richmond, New London and Montague.

A large canvas tent was erected at each field meeting, and portable benches were used as seats. This provided a resting place where lectures were given and heard in comfort.

The Farm Garden

There is probably no part of the farm which yields as much in terms of health and pleasure as the garden. For this reason the stimulating of interest in the home garden is an active project of the division.

In a number of instances the winter supply of garden vegetables is grown in the field with the main root crop, and on most stations a smaller area is set aside near the house for a few early vegetables and for those requiring more specialized care.

Flowers and shrubs for home beautification are also encouraged and a home orchard of apples, plums and pears is recognized as within the reach of all.

At several stations new plantings of fruit trees have been made to replace those destroyed by the severe winter of 1933-34. It was noted that hardy varieties such as Melba and Lobo, propagated on hardy roots like the Anis, Antonovka and Beautiful Arcade seedlings from Ottawa, came through that unprecedented winter safely. Most of the damage occurred to the relatively tender varieties such as Gravenstein, King and Spy. In all new plantings on Prince Edward Island, people are strongly urged to insist on hardy roots of the sorts mentioned above, and to select only those varieties which have proved their ability to survive the occasional extreme winter.

Many new varieties of tree fruits are being tested at the experimental station, Charlottetown, and detailed information is available.

Soil Fertility and Chemical Fertilizers

Soil fertility is a major problem in Prince Edward Island and the glowing statements of early explorers on the fertility of the soil are not substantiated by modern analyses of Island soils. Undoubtedly the virgin soils of the province were far richer in humus than the same soils are to-day, and there is a growing belief among thoughtful farmers that permanent agriculture is possible only if larger supplies of organic matter are incorporated with the soil. From this standpoint, chemical fertilizers, no matter how generously used, can only serve as a stepping stone for the production of larger crops which later may be returned to the soil, directly or indirectly, to build up this humus supply. Such soils in turn may be expected to give a greater response to the chemical fertilizers used.

Records of the Maritime Fertilizer Council for 1937 show that Prince Edward Island purchased the largest tonnage of chemical fertilizers per capita of any province. The quantity averaged approximately 500 pounds for every man, woman and child.

Fertilizer studies have formed a large part of the work of the illustration stations since their organization in 1923, and new problems arise each year. In the following pages the results of 11 soil fertility projects are discussed.

Barnyard Manure Alone and when Supplemented with Chemical Fertilizers for Potatoes

For the past six years a comparison has been made on the illustration stations of the value of chemical fertilizers as a supplement to stable manure for potatoes. In the first three years of the test 800 pounds of a 4-8-8 mixture per acre were used, and in the last three years 1,000 pounds of a 4-8-10 mixture per acre. Each plot received approximately 10 tons of manure per acre.

The following figures show the increased yields secured:—

BARNYARD MANURE ALONE AND WITH FERTILIZER FOR POTATOES

Year	Yields in bushels per acre		
	Manure alone	Manure and fertilizer	Increase due to fertilizer
1932	170·0	264·7	94·7
1933	192·7	278·1	85·4
1934	222·0	300·5	78·5
1935	154·7	255·8	101·1
1936	171·3	252·4	81·1
1937	227·3	272·3	45·0
Average	189·7	270·6	80·9

It is noted that the extremely dry summer of 1937 gave the smallest increase from the fertilizer of any year, but the average increase for the half ton of fertilizer at all points for the six years has been 80·9 bushels per acre.

Growing Potatoes under Different Fertilizer Treatments

Difference of opinion has been expressed by growers, fertilizer dealers and others as to the relative value of 4-8-7, 4-8-10, 4-8-13 and 5-9-8 for the production of potatoes. These treatments have been compared at a uniform rate of 1,000 pounds per acre at Alliston and Iona for three years and at St. Peters for two years. The yields were as follows:—

GROWING POTATOES UNDER DIFFERENT FERTILIZER TREATMENTS

YIELDS IN BUSHELS PER ACRE

Station	Treatment			
	1,000 lb. 4-8-7	1,000 lb. 4-8-10	1,000 lb. 4-8-13	1,000 lb. 5-9-8
Alliston (3)*	250·3	293·3	303·6	269·0
Montague (3)	233·3	249·6	241·6	215·6
St. Peters (2)	243·5	271·5	247·0	225·5
Average	242·2	271·5	266·2	238·1

* Number of years.

A COMPARISON OF LIGHT AND HEAVY APPLICATIONS OF FERTILIZER FOR POTATOES

In the earlier years of the potato industry in the province one ton of fertilizer per acre was a common application. Since the era of lower prices, many farmers have desired to know if such heavy applications were profitable.

In 1936 a comparison was made at seven stations of 1,000 pounds and 2,000 pounds of 4-8-10 fertilizer per acre. In 1937 the same comparison was made at six stations.

The average yields of the 13 tests showed 254·6 bushels per acre from the 1,000 pounds and 277 bushels from the 2,000 pounds, an average increase of 22·4 bushels per acre.

EFFECT OF COMMERCIAL FERTILIZER ON THE GROWTH OF CORN

Corn has been grown as a supplementary forage crop on the illustration stations of Prince Edward Island since their organization of 1923. Previous to that time very little corn was grown and much of that sown was of a variety too late to mature in the short, cool seasons of this province. Immediate success followed the introduction of suitable varieties and corn is now a regular crop on most of the dairy farms.

Only two silos are in use on the 14 stations, the other operators use the corn as green feed in late summer when the pastures are short. The majority of farmers follow the latter plan.

During the past ten years comparisons have been made of the yields of corn when grown with manure alone and when the manure has been supplemented with chemical fertilizer. The fertilizer used has varied from year to year but has contained a fairly generous quantity of the three chief fertilizing constituents. For example, in 1935, 750 pounds of 2-12-6 per acre were used, and in 1936, 750 pounds of 5-10-5.

The results at each station are recorded in the following table:—

EFFECT OF COMMERCIAL FERTILIZER ON THE GROWTH OF CORN

YIELD IN TONS PER ACRE

Station	Number of years	Average fertilizer cost, 1935, 1936	Average yields for period		
			Manure alone	Manure and fertilizer	Increase due to fertilizer
		$ cts.	tons	tons	tons
Alliston	1	4 86	9·77	14·26	4·49
DeSable	4	4 62	13·78	18·55	4·77
Glenwood	6	4 87	12·71	16·93	4·22
Iona	1	.....	3·74	3·74	0·00
Montague	9	4 79	11·70	16·65	4·95
New London	8	4 85	11·04	15·70	4·66
Palmer Road	8	4 83	11·92	14·70	2·78
Red Point	8	4 57	10·66	13·09	2·43
Richmond	10	4 73	11·32	14·19	2·87
Rose Valley	9	4 96	12·75	16·64	3·89
Rustico	1	.....	18·51	18·70	0·19
St. Peters	9	4 87	13·75	17·14	3·39
West Devon	8	4 50	11·56	15·35	3·79
Wood Islands	8	4 76	7·00	12·01	5·01
Averages	.....	4 77	11·53	15·28	3·75

These records show that manure alone has produced a fair tonnage of green fodder but a substantial increase has resulted from the use of chemical fertilizers. In 90 tests at 14 stations in the past ten years, chemical fertilizers have produced this increase at a cost of less than $1.50 per ton, based on fertilizer prices in 1935 and 1936.

EFFECT OF COMMERCIAL FERTILIZER ON THE GROWTH OF SWEDES

Although chemical fertilizers are widely used in the province for all crops, there is an occasional suggestion from thoughtful farmers that manure alone is all that is necessary for field roots.

An experiment has been conducted at eight stations comparing manure alone with manure supplemented by commercial fertilizer. The composition of the fertilizer has varied in different years, but in every case has supplied a substantial quantity of the three main fertilizing elements. In 1936 the application was 750 pounds of 5-10-5 per acre, with which 15 pounds of borax was incorporated before sowing.

Fifty tests at eight stations over a nine-year period showed an average yield of 17·67 tons of swedes per acre from the manure alone and 23·68 tons per acre from the manure and fertilizer, an increase of 6·01 tons per acre from the use of the fertilizer.

EFFECT OF NITROGENOUS FERTILIZERS ON TIMOTHY MEADOWS

The practice of sowing nitrogenous fertilizers alone on timothy meadows in the spring is continued on the illustration stations. In every case increased yields have been obtained at a very low cost per unit. The applications have been made early in May at the rate of 100 pounds of sulphate of ammonia or 130 pounds of nitrate of soda per acre. At only three stations have the increased yields been less than half a ton per acre.

The increased yield was secured in 1937 with nitrate of soda at a fertilizer cost of $2.60 per acre, and in a number of years when sulphate of ammonia has been used, the cost has been as low as $1.50 per acre.

In the entire 89 tests, at 14 stations during the past nine years, the average increase has been 1,245 pounds per acre.

The effect of this practice on the other fertilizing elements in the soil has not been studied.

The following table records the results at each station:—

EFFECT OF NITROGENOUS FERTILIZERS ON TIMOTHY MEADOWS

INCREASED YIELDS IN POUNDS PER ACRE

Station	Number of years	Average increase
Alberton	2	620
Alliston	1	880
DeSable	5	1,240
Glenwood	8	1,340
Iona	7	1,160
Montague	9	1,360
New London	8	1,160
Palmer Road	7	1,580
Red Point	6	1,080
Richmond	8	1,440
Rose Valley	8	1,520
Rustico	7	1,200
St. Peters	8	1,260
Wood Islands	5	780
	Total 89	Average 1,262

THE VALUE OF LIQUID MANURE FOR THE PRODUCTION OF TIMOTHY HAY

The value of liquid manure as a source of plant food has long been recognized, but care in saving this valuable material is still lacking on many farms.

In 1935 a comparison was made at two stations with liquid manure and certain fertilizers, on the growth of timothy hay. Practically the same amounts of nitrogen and potash are supplied by the sulphate of ammonia and muriate of potash treatment as are contained in the liquid manure.

The results are given below:—

THE COMPARATIVE VALUE OF LIQUID MANURE AND CHEMICAL FERTILIZERS ON TIMOTHY HAY

YIELDS IN TONS PER ACRE

Treatment	DeSable	Red Point	Average
4 tons liquid manure	2·02	1·69	1·85
200 lb. sulphate of ammonia 100 lb. muriate of potash	1·88	1·50	1·69
100 lb. sulphate of ammonia	1·22	1·13	1·17
500 lb. 5-9-8 mixture	1·45	1·31	1·38
Check	0·66	0·75	0·70

This test indicates that the fertilizing ingredients in liquid manure are fully equal to those in chemical fertilizers. The desirability of conserving liquid manure by every possible means is indicated.

PASTURE IMPROVEMENT BY THE USE OF CHEMICAL FERTILIZERS

The improvement of permanent pastures by the use of chemical fertilizers is of wide interest and is receiving special study on the illustration stations of Prince Edward Island.

Under the common system of cropping land in the province, fields are turned over to pasture following one or more crops of hay. The first year in pasture is usually very poor, but on land that is in a fair state of fertility, wild white clover comes in as the taller grasses are checked by grazing, and after two or three years in pasture a fairly good sod is established. The fields are then ploughed and grain or hoed crops planted. The restorative effect of the pasture clover is highly valued.

The management of a fertilized pasture involves leaving some field or fields in pasture for an indefinite period, and the natural fertility is supplemented by regular applications of commercial fertilizer. The remaining fields are released for other crops.

At Iona, Montague and New London three-acre fields were fenced and fertilized and a similar area fenced but not fertilized. Fertilizer in the initial year consisted of 150 pounds sulphate of ammonia, 350 pounds of 16 per cent superphosphate and 100 pounds muriate of potash, and in subsequent years 75 pounds sulphate of ammonia, 125 pounds superphosphate and 75 pounds muriate of potash per acre.

Results from these stations are as follows:—

GRAZING DAYS AND MILK YIELDS IN FERTILIZED AND UNFERTILIZED PASTURES

Station	Years fertilized	Average grazing days per acre		Fertilizer cost per year	Average increase in milk production	
		Fertilized	Check		Pounds	Number years
				$ cts.		
Iona	4	52·5	23·9	6 16	256·2	1
Montague	5	88·5	43·6	4 98	475·0	1
New London	6	63·6	31·2	5 61	1,046·0	2

The chemical fertilizer has doubled the grazing days per acre at these stations and the increased milk has been secured at a cost of $2.40 per hundred at Iona, $1.05 per hundred at Montague and $0.54 per hundred at New London.

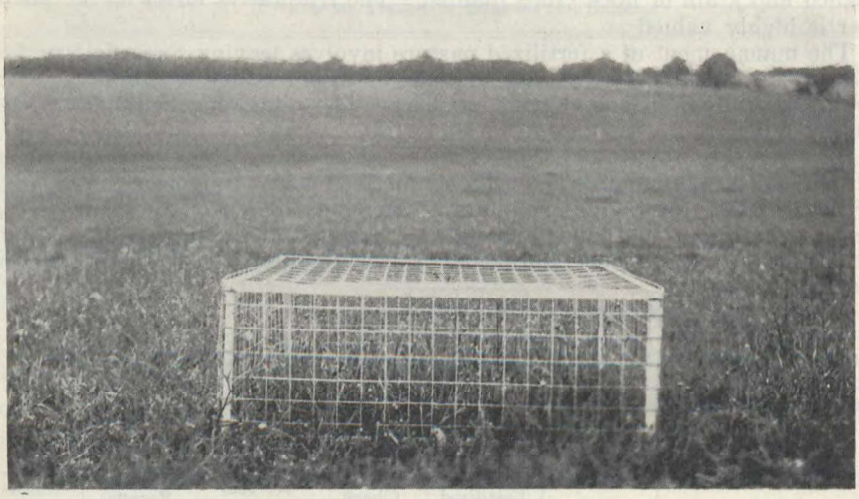
At DeSable, Glenwood, Red Point, Rose Valley, Rustico and St. Peters, animals feed at will on both fertilized and unfertilized areas and growth observations are taken in small enclosures from which the animals are excluded. Scores were made from time to time through the season on the yield, type of herbage and apparent palatability. Complete fertilizers were applied annually in the same quantities as in the previous experiment, and superphosphate, 16 per cent, was applied at the rate of 600 pounds per acre in 1936 only. The following table shows the relative yields of green material:—

RELATIVE YIELDS OF GREEN MATERIAL ON PASTURES

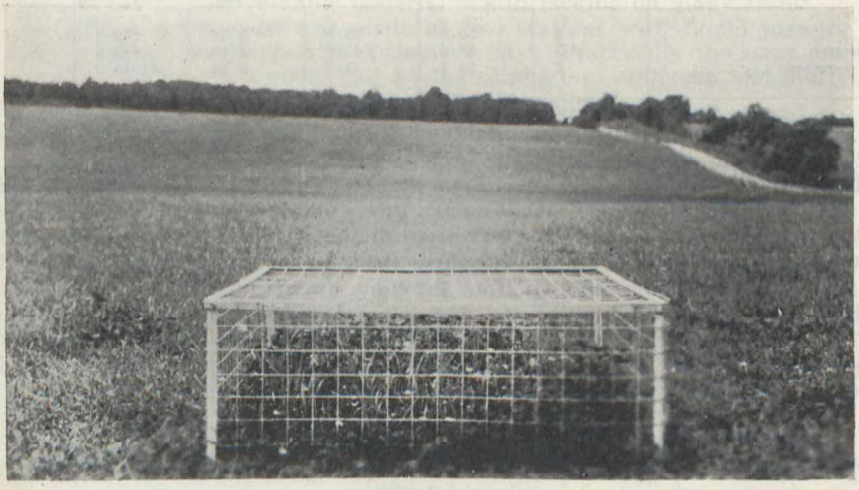
Station	Number years	Complete fertilizer		Superphosphate		Check
		Score	Cost per year	Score	Cost per year	
		%	$ cts.	%	$ cts.	%
DeSable	2	.....	.....	95·5	2 40	65·5
Glenwood	2	.....	.....	39·5	2 40	21·0
Red Point	2	84·0	5 53	68·0	2 40	50·0
Rose Valley	2	46·5	5 53	63·0	2 40	25·0
Rustico	2	90·0	5 53	83·5	2 40	71·5
St. Peters	2	77·0	5 53	66·5	2 40	35·0
Average	2	74·37	5 53	69·33	2 40	44·66

Exclusive of DeSable and Rustico where all the growth was extremely vigorous, the applications of complete fertilizer practically doubled the pasturage.

Superphosphate alone gave a substantial increase in the yield of green material, but less than the complete fertilizer. The cost of the superphosphate was definitely lower than the complete fertilizer.



Permanent pasture, Rose Valley, P.E.I., showing area where no fertilizer was applied.



Permanent pasture, Rose Valley, P.E.I., showing comparative increase in growth from the use of commercial fertilizer.

Brown-heart of Swedes

Brown-heart of swedes is a serious disorder in Prince Edward Island. Affected table stock is unsaleable and the keeping quality of roots grown for fodder is seriously impaired.

Jointly with the Central and Maritime Committees on brown-heart investigations, the Illustration Stations Division has conducted experiments in several parts of the province. Results of these experiments have been applied in demonstrations at all the stations.

In 1933 ground limestone, salt, sulphur and borax were compared at ten stations. The limestone and salt each increased the brown-heart, the sulphur had little effect and the borax definitely reduced the trouble. A more detailed record of these tests was published in the progress report of the illustration stations for the years 1931-1933.

In 1934 tests were made with borax alone at ten stations. Each plot received manure at the rate of 10 tons per acre, supplemented by 750 pounds of 2-12-6 mixture. The results from the various borax treatments at the six stations where brown-heart occurred were as follows:—

A COMPARISON OF DIFFERENT METHODS OF APPLYING BORAX

Treatment	Per cent roots free from Brown-Heart
No borax	17·17
10 lb. borax in drills	52·17
10 lb. borax in fertilizer	49·00
No borax	19·25
5 lb. borax in drills	45·67
5 lb. borax in fertilizer	46·83
No borax	21·50
15 lb. borax broadcast	52·17
10 lb. borax broadcast	54·33

It became evident from this test that borax applied in the drill, mixed with the fertilizer or sown broadcast was equally effective in the control of brown-heart.

In 1935 manure alone was compared with manure and borax; and fertilizer alone with fertilizer and borax. Tests were made at seven stations where brown-heart is usually prevalent. Manure was applied at the rate of 20 tons per acre. Fertilizer, 2-12-6, was applied at the rate of 1,000 pounds per acre. Borax was used at the rate of 15 pounds per acre. The results are as follows:—

CONTROL OF BROWN-HEART WITH BORAX

Treatment	Percentage Brown-Heart		
	Severe	Slight	Free
Fertilizer alone	36·5	24·4	39·1
Fertilizer and borax	26·4	24·5	49·1
Manure alone	26·4	25·2	48·4
Manure and borax	14·7	28·0	57·3

While none of the treatments gave complete control, borax made a decided improvement in the manure plot. It was also evident that brown-heart was more difficult to control where fertilizer alone was used than where stable manure was applied.

In 1936 the prevalence of brown-heart on plots receiving one, two and three tons of limestone per acre respectively was compared with that on plots receiving the same applications and 15 pounds per acre of borax. The following are the average results from six stations:—

CONTROL OF BROWN-HEART WITH BORAX IN PRESENCE OF DIFFERENT RATES OF GROUND LIMESTONE

PER CENT OF ROOTS FREE FROM BROWN-HEART

Borax				No borax			
No lime	1 ton	2 tons	3 tons	No lime	1 ton	2 tons	3 tons
58	54·5	48	40·6	11·2	8·2	6	3·2

These figures indicate that borax at the rate of 15 pounds per acre gave a fair measure of control even in the presence of heavy applications of ground limestone, but was somewhat less effective as the quantity of lime increased.

In 1937 borax at the rate of 15 pounds per acre was used at 13 stations. At five stations no brown-heart was recorded. On the remaining eight stations the roots from the treated area were practically free from brown-heart, while those on the untreated area averaged 81 per cent severe brown-heart.

THE EFFECTS OF DIFFERENT RATES OF GROUND LIMESTONE

In the spring of 1936 ground limestone was applied to three one-acre plots on each illustration station at the rate of one ton, two tons and three tons per acre, with a fourth acre on which no limestone was applied. The application was made to the root crop and the study was planned for the entire period of the rotation.

In the fall of 1936 a pH. reading (acid determination) was made for each plot, and showed that each untreated plot was definitely acid, while a few which received the three-ton application had passed the neutral stage. The remainder were slightly acid.

Observations on the hoed crop in 1936 were as follows:—

EFFECTS OF VARYING RATES OF LIMESTONE ON SWEDES

YIELD IN TONS PER ACRE

Station	3 tons limestone	2 tons limestone	1 ton limestone	Check no limestone
New London	37·49	36·43	33·26	.....
Red Point	31·35	29·70	27·72	25·08
Rose Valley	33·26	31·25	31·25	28·64
Average	34·02	32·46	30·74	26·86

While the number of tests is small and results are for only one year, it appears that lime increased the yield of swedes and that the higher rates of lime still further raised the yield.

THE EFFECT OF VARYING RATES OF LIMESTONE ON POTATO SCAB

PERCENTAGE OF SCABBY TUBERS

Station	3 tons limestone	2 tons limestone	1 ton limestone	Check
Glenwood	100	100	100	Traces
Iona	100 severe	100 severe	100 slight	100 slight
New London	Free	Free	Free	Free
Palmer Road	75	76	52	4
Rose Valley	100 severe	100 severe	100 severe	100 slight
Rustico	6 slight	6 slight	8 slight	Free

It appears from this study that at Glenwood, Iona, Palmer Road and Rose Valley scab was previously in the soil and limestone applications increased the severity of the attack. At Rustico the soil apparently had very little of the scab organism present and damage was slight. At New London it is evident that no scab existed in the soil and therefore the lime applications failed to increase the disease.

In 1937 the limed areas were in grain and no definite yields were recorded. It was noted at Richmond, however, that the lime exerted a beneficial effect on the general vigour of the wheat crop.

At Richmond and Alberton a similar experiment was laid down in 1936 in a field which was being seeded to grain and hay seed mixture. Yields of this were taken in 1937 as follows:—

THE EFFECT OF VARYING RATES OF LIMESTONE ON MIXED TIMOTHY-ALFALFA-CLOVER HAY

YIELDS IN TONS PER ACRE

Station	3 tons limestone	2 tons limestone	1 ton limestone	Check
Richmond	2·34	2·36	2·44	0·86
Alberton	1·20	0·76	1·16	0·40

At Alberton severe winter killing occurred and all hay yields were low, but the lime plots were better than the check.

At Richmond the one-ton application gave practically three times as much hay as the check, but no further increase was shown from heavier applications.

A COMPARISON OF FOUR COMMON FERTILIZING PRACTICES

There are very few farms in the province where enough manure is produced for all crop needs, and a difference of opinion is frequently expressed as to the best means of applying the manure and supplementary chemical fertilizer. Some farmers prefer to apply a fairly generous coat of manure to a portion of the field and finish the balance with chemical fertilizer, while others use a light coat of manure and a light dressing of fertilizer over all the area in question.

In the spring of 1937 a comparative test was laid down at each station to study this matter. One treatment consisted of manure alone, one of fertilizer alone and two of manure and fertilizer combined. Manure alone was applied at the rate of 16 tons per acre; fertilizer alone at the rate of 1,500 pounds of

4-8-10 per acre; manure at the rate of 8 tons plus superphosphate (20 per cent) at the rate of 500 pounds per acre and manure 8 tons plus 2-12-6 at the rate of 750 pounds per acre.

The results were as follows:—

AVERAGE YIELDS FROM FOUR COMMON FERTILIZING TREATMENTS

Crop	Number of stations	16 tons manure	8 tons manure, 500 lb. 20% super.	1,500 lb. 4–8–10	8 tons manure 750 lb. 2–12–6.
Potatoes	12	223·75 bush.	208·25 bush.	207·25 bush.	221·50 bush.
Swedes	11	12·28 tons	13·16 tons	12·79 tons	11·52 tons
Mangels	6	15·75 "	15·78 "	16·42 "	14·33 "
Corn	5	10·33 "	12·26 "	11·00 "	11·90 "

The differences in yield from the four treatments under the extremely dry seasonal conditions of 1937 were slight, and it is doubtful if conclusions should be drawn at this stage of the experiment.

Variety Tests of Swedes

In 1934 ten varieties of swedes which were claimed to be more or less resistant to club-root were compared on a special club-root area at Rustico. Ditmars Bronze Top was used as a check. In this test Wilhelmsburgher from two different sources produced an average of 97·4 per cent of disease-free roots, followed by Bangholm Herning from two sources with an average of 89·9 per cent of sound roots. All other varieties were much lower in resistance with the check variety showing an average of only 6·9 per cent of healthy roots.

In 1935 a comparison of registered Ditmars Bronze Top and Hazards Improved was made at ten stations. At six stations the Ditmars Bronze Top gave a higher tonnage, while at four stations the Hazards Improved was slightly higher. The average for the ten stations showed 18·85 tons per acre for the Ditmars Bronze Top and 19·55 tons per acre for the Hazards Improved. Wilhelmsburgher again showed its superiority in club-root resistance at Rustico.

In 1936 a comparison of commercial Wilhelmsburgher and the same variety grown at Rustico was made at Rustico with Hazards Improved and Millpond. The two lots of Wilhelmsburgher were almost free from club-root, while the two latter varieties were nearly 100 per cent diseased.

In 1937 registered Ditmars Bronze Top was grown at every station, registered Laurentian Purple Top at three stations, Wilhelmsburgher at one station, Hazards Improved at six stations and McKay Purple Top at two stations. Omitting four locations where the results were not comparable, the registered Ditmars Bronze Top gave an average yield of 17·4 tons per acre, the registered Laurentian Purple Top 17·8 tons per acre, Hazards Improved 16·7 tons per acre, Wilhelmsburgher 18·6 tons per acre and McKays Purple Top 18·0 tons per acre.

The Ditmars Bronze Top and Laurentian Purple Top are highly regarded for the table stock trade.

Comparative Yields of Mangels

Mangels have received less attention on the illustration stations and over the province than swedes, but are increasing in popularity.

In 1936 and 1937 the Tip Top, a yellow intermediate variety developed at Ottawa and Prince White Sugar (formerly listed as Giant White Sugar—Morse)

were compared on the illustration stations. Both of these varieties are accepted for registration by the Canadian Seed Growers' Association. The average yields are as follows:—

COMPARISON OF TWO COMMON MANGEL VARIETIES

YIELDS IN TONS

Variety	1936	1937	Average
Tip Top	15·40	14·4	14·9
Prince White Sugar	21·99	18·4	20·2

The Prince White Sugar has given a superior yield in every instance. The average of all tests for the two years shows an increased yield of 5·3 tons per acre in favour of this variety.

NEW CROPS

Initial tests have been made at Alliston, Iona and Wood Islands in 1936 and 1937 to ascertain if annual lupins, acid tolerant legumes used widely in Europe as soil builders might be useful in Prince Edward Island. In the past two years the crop has demonstrated its ability to thrive on extremely dry and infertile soils. At the same time it appears to gather substantial quantities of nitrogen through the nodules on the roots.

Inoculation with a special strain of bacteria has been essential in order to secure a satisfactory stand.

Winter wheat, Kharkov M.C. 22, was seeded in the fall of 1937 at six places to discover if this cereal would successfully escape: (1) The wheat joint worm (*Isoma tritici* Fitch), (2) stem rust which is often encountered when seeding is delayed to avoid the joint worm, (3) competition with wild radish (*Raphanus raphanistrum*).

Two acres of winter rye, Cornell No. 45, were sown at Alberton to test its suitability for farms in this province.

YIELD DATA AND COST OF PRODUCTION STUDIES

A record of the yields secured and labour, fertilizer and other costs incurred in growing the common farm crops is kept on the illustration stations.

While the records of costs may be of chief value to the operator as a measure of his efficiency from year to year, the yields secured are of general interest and a complete table covering these items for all the stations is included in this report.

In calculating the production costs, labour, seed, fertilizer, taxes and interest on land are charged at local rates. Manure is charged at $1.50 per ton; machinery at $2.85 per acre.

A share of the manure, fertilizer and lime is charged to each crop in the rotation as their effect remains for several years.

POTATOES

Potatoes continue to be the leading cash crop in the province although competition from other producing areas has become extremely keen in all markets. Irish Cobbler and Green Mountain are the chief varieties in the province and both are grown on the illustration stations.

In studying the figures submitted for the cost of growing this crop it should be noted that the yields given are field run and no charge is made for grading, containers or hauling to market. Neither is any allowance made for

culls, shrinkage or the occasional severe loss from unforeseen events which is the experience of farmers in every branch of their varied occupation.

The average yield per acre from 123 tests in the past 14 years was 294·7 bushels per acre, produced at an average cost of 20 cents per bushel.

SWEDES

Originally grown as a succulent feed for cattle, in recent years swedes have been grown extensively for export as a table vegetable during the "shut-in" months of the year when their vitamin content has rendered them particularly valuable.

Work with this crop is reported more fully under the headings: "Variety Tests of Swedes" and "Brown-Heart of Swedes."

On the farms of the province and on the illustration stations, Canadian varieties grown under registration by the Canadian Seed Growers' Association are largely supplanting imported seed of uncertain varietal type. Ditmar's Bronze Top, Laurentian Purple Top, and Wilhelmsburgher are the most popular.

The average yield per acre from 147 tests in the past 15 years was 21·22 tons per acre at a cost of $2.32 per ton.

MANGELS

"Comparative Yields of Mangels" are discussed under that heading elsewhere in this report. Of the two registered varieties, Prince White Sugar and Tip Top, the former has been selected and grown for seed for many years in the Kensington district and appears to be particularly suited to conditions in this province. The Prince White Sugar, while higher in yield, is lower in percentage of dry matter and is reported by one operator as more palatable to hogs.

The average yield per acre from 23 tests in the past three years was 16·34 tons per acre, costing $2.67 per ton.

FODDER CORN

This crop has been mentioned under the heading: "Effect of Commercial Fertilizers on the Growth of Corn." Few projects initiated by the division have been so generally adopted by the farmers of the province as the use of corn for supplementary feed for the dairy herd in late summer. Longfellow, a yellow flint type, is the variety most widely grown.

Records from 130 crops on 14 stations in the past 14 years show an average yield of 14·78 tons per acre produced at a cost of $2.87 per ton.

OATS

This crop has always been the leading cereal crop in the province from the standpoint of acreage. Alaska and Cartier are recommended as early varieties and mature about ten days earlier than Banner or Victory which are the standard late sorts. The later varieties give a higher yield of both grain and straw if they have time to mature. On some of the heavier soils of the province seeding is frequently late and rust often damages the late varieties before they reach maturity. Under such conditions the early varieties have proved more desirable. Erban, a medium late variety resistant to leaf rust, was outstanding in the severe rust epidemic of 1937, remaining erect when susceptible varieties collapsed.

An average yield of 44·3 bushels per acre from 81 tests has been grown in the past 11 years at a cost of 44 cents per bushel.

BARLEY

Barley is increasing in popularity on the more fertile soils of the province not only because it is believed to produce more nutrients per acre under those conditions than oats, but also because of its importance in the hog ration during the finishing period.

Charlottetown No. 80 is grown exclusively on the stations and is estimated to occupy at least 90 per cent of the barley acreage of the province. This is a two-rowed variety of the Chevalier type, selected in the early years of the Charlottetown station from Old Island Two-rowed. Many of the awns drop in the field.

In 36 tests in the past ten years the average yield has been 31·77 bushels per acre, costing 66 cents per bushel.

WHEAT

Prince Edward Island grows a larger acreage of wheat in proportion to other cereals than either of the other Maritime Provinces. Numerous small local mills provide a ready means of converting the crop into flour. Unfortunately the wheat joint worm (*Isoma tritici* Fitch) causes severe injury in many districts in the spring, and if seeding is delayed to escape this insect, rust frequently claims the crop in the fall. Reference is made under "New Crops" to trials commenced in 1937 to escape this injury. In the meantime the varieties Huron, White Fife and White Russian are most commonly grown.

In 43 trials in the past nine years the average yield per acre has been 17·1 bushels costing $1.71 per bushel.

CLOVER

The value of clover in the ration of all animals, particularly dairy cattle and young stock, is generally recognized. An element of risk is involved in sowing clover alone, so that it is usually sown in a mixture with timothy. The usual mixture used on the illustration stations consists of: Timothy, eight pounds; red clover, five pounds; alfalfa, five pounds; and alsike, two pounds per acre.

The first hay year is chiefly clover, but a small proportion of timothy is always present. Very little clover persists after the first year, but on fields well supplied with lime alfalfa gains in vigour for two or three years if the aftermath is not grazed too early or too closely. The presence of the alfalfa is believed to improve both the quality and the quantity of the hay as compared to the timothy alone. On unlimed soils the clover has been extremely light in many years, which is reflected in the average yield per acre.

In 126 trials at 13 stations in the past 13 years clover hay has given an average yield of 1·51 tons per acre, costing $12.55 per ton.

TIMOTHY

Timothy is the leading hay plant in this province as in other parts of Eastern Canada. It is hardy, productive, palatable and produces large quantities of seed which can be easily harvested with the ordinary binder and thresher. The quantity of seed grown by the operators has steadily increased, and in 1937 13 operators harvested around 2·5 tons of timothy seed, a large share of which will be sold to neighbours.

In 121 fields in the past 13 years the average yield of timothy hay has been 1·59 tons per acre, costing $9.25 per ton.

Station	Swedes					Mangels					Potatoes				
	Number of years grown	Yield per acre		Cost per ton		Number of years grown	Yield per acre		Cost per ton		Number of years grown	Yield per acre		Cost per bush.	
		1937	Average	1937	Average		1937	Average	1937	Average		1937	Average	1937	Average
		tons	tons	$ cts.	$ cts.		tons	tons	$ cts.	$ cts.		bush.	bush.	$ cts.	$ cts.
Alberton	1	15·6	15·60	2 86	2 86	1	18·9	18·90	2 37	2 37	1	343·0	343·0	0 13	0 13
Alliston	3	10·3	17·32	2 90	2 16	1	8·4	8·40	3 60	3 60	3	156·0	280·0	0 25	0 17
DeSable	6	19·6	24·84	1 84	1 71	1	15·7	15·70	2 53	2 53	6	275·0	337·3	0 18	0 15
Glenwood	10	15·6	23·26	2 51	1 92	3	20·3	16·59	2 03	2 60	6	.....	276·8	.....	0 20
Iona	15	8·5	18·78	3 96	2 10	1	10·4	10·40	3 69	3 69	12	187·5	260·6	0 21	0 24
Montague	15	9·4	25·01	4 12	2 19	.....	.....	.....	.....	.....	15	167·0	323·0	0 24	0 19
New London	10	11·8	22·16	3 35	2 17	3	16·1	22·99	2 06	1 72	10	189·7	256·7	0 23	0 22
Palmer Road	11	21·1	26·47	1 85	1 56	3	18·5	15·40	1 93	2 72	4	235·0	276·6	0 18	0 17
Red Point	11	13·0	20·31	3 00	2 36	1	.....	17·50	.....	2 42	11	225·4	312·2	0 21	0 17
Richmond	14	12·0	19·47	3 34	3 14	3	16·7	13·75	2 08	3 15	8	196·5	254·5	0 23	0 29
Rose Valley	14	15·4	21·79	2 18	2 46	.....	.....	.....	.....	.....	14	213·2	308·7	0 16	0 20
Rustico	12	17·8	22·82	2 41	2 12	3	20·4	22·67	2 32	2 11	7	186·0	322·7	0 24	0 19
St. Peters	14	21·8	22·78	1 79	2 22	3	14·8	17·40	2 55	2 46	15	126·0	295·0	0 34	0 21
Wood Islands	11	17·0	16·43	2 28	3 54	.....	.....	.....	.....	.....	11	236·5	279·2	0 18	0 22
Average	.....	14·9	21·22	2 74	2 32	.....	16·0	16·34	2 52	2 67	.....	210·5	294·7	0 21	0 20

68813—3½

Station	Barley					Oats					Wheat				
	Number of years grown	Yield per acre		Cost per bushel		Number of years grown	Yield per acre		Cost per bushel		Number of years grown	Yield per acre		Cost per bushel	
		1937	Average	1937	Average		1937	Average	1937	Average		1937	Average	1937	Average
		bush.	bush.	$ cts.	$ cts.		bush.	bush.	$ cts.	$ cts.		bush.	bush.	$ cts.	$ cts.
Alliston	3	28·0	19·0	0 66	0 77	3	30·0	26·0	0 64	0 59	3	22·0	12·3	1 00	1 56
DeSable	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	19·0	19·0	1 23	1 23
Glenwood	6	40·0	35·8	0 55	0 59	5	40·0	60·6	0 32	0 32	2	30·0	21·5	0 75	1 21
Iona	1	18·3	18·3	1 11	1 11	5	.....	25·2	.....	0 95	6	12·0	9·7	1 73	2 47
Montague	.....	.....	.....	.....	.....	11	34·0	43·8	0 30	0 49	3	.....	16·1	.....	1 70
New London	10	27·0	31·1	0 90	0 69	7	.....	43·4	.....	0 41	.....	.....	.....	.....	.....
Palmer Road	3	.....	36·9	.....	0 56	6	.....	37·3	.....	0 59	4	20·0	17·4	1 06	1 50
Red Point	.....	.....	.....	.....	.....	3	.....	56·0	.....	0 38	4	.....	13·2	.....	2 36
Richmond	1	.....	33·0	.....	0 47	9	.....	50·7	.....	0 48	5	.....	18·2	.....	2 11
Rose Valley	4	35·0	33·4	0 55	0 56	7	42·0	47·4	0 45	0 48	9	.....	16·2	.....	1 74
Rustico	5	.....	41·0	.....	0 53	7	.....	58·5	.....	0 34	4	.....	24·4	.....	1 16
St. Peters	3	.....	37·4	.....	0 64	9	42·0	58·7	0 46	0 44	2	.....	20·6	.....	1 73
Wood Islands	.....	.....	.....	.....	.....	9	20·0	24·7	0 91	0 92	.....	.....	.....	.....	.....
Average	.....	29·7	31·77	0 75	0 66	.....	34·7	44·36	0 51	0 53	.....	20·6	17·1	1 15	1 71

Station	Corn					Timothy					Clover				
	Number of years grown	Yield per acre		Cost per ton		Number of years grown	Yield per acre		Cost per ton		Number of years grown	Yield per acre		Cost per ton	
		1937	Average	1937	Average		1937	Average	1937	Average		1937	Average	1937	Average
		tons	tons	$ cts.	$ cts.		tons	tons	$ cts.	$ cts.		tons	tons	$ cts.	$ cts.
Alberton	1	8·20	8·20	3 68	3 68	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Alliston	3	12·00	10·45	2 33	3 15	2	2·00	1·69	3 88	5 25	2	1·88	1·45	5 34	6 08
DeSable	4	.....	18·55	.....	1 89	4	2·90	1·88	4 46	7 52	5	2·50	1·87	5 95	9 21
Glenwood	10	16·00	16·48	1 92	2 16	9	2·16	1·84	7 24	6 65	9	.....	1·66	.....	7 57
Iona	13	.....	11·33	.....	4 34	12	1·92	1·06	3 11	13 71	13	4·30	0·87	2 98	24 69
Montague	14	.....	17·44	.....	2 80	12	2·62	1·82	4 10	7 97	13	2·78	1·77	3 93	11 83
New London	10	18·60	16·21	1 97	2 64	9	.....	1·50	.....	9 02	9	.....	1·07	.....	14 28
Palmer Road	11	9·20	15·66	2 87	2 22	9	1·50	1·86	5 26	6 79	10	2·02	1·77	6 15	8 20
Red Point	10	.....	13·08	.....	3 13	7	.....	1·29	.....	11 54	7	.....	1·05	.....	15 74
Richmond	13	.....	14·44	.....	3 32	9	.....	1·83	.....	9 03	12	.....	1·62	.....	11 45
Rose Valley	14	10·20	17·69	2 46	2 65	13	2·06	1·67	4 88	9 21	13	.....	1·73	.....	12 99
Rustico	2	.....	20·11	.....	1 84	12	0·71	1·56	12 44	8 92	12	.....	1·69	.....	10 41
St. Peters	14	.....	15·74	.....	2 98	13	1·75	1·77	4 56	7 87	13	.....	2·02	.....	10 04
Wood Islands	11	11·80	11·57	2 20	3 41	10	1·64	0·90	3 78	16 75	8	3·40	1·11	4 22	20 69
Average	.....	12·29	14·78	2 49	2 87	.....	1·93	1·59	5 37	9 25	.....	2·81	1·51	4 76	12 55

The Relative Efficiency of Oats, Barley and Wheat for the Production of Feed Nutrients

Oats, wheat and barley are all commonly grown on the farms of Prince Edward Island and on the illustration stations their place in the rations of farm animals is fairly well established. Questions are frequently asked regarding the relative efficiency of the three, particularly of oats and barley, as a source of feed for live stock. In the following table a comparison is made of yield data and cost of production for oats, barley and wheat as recorded on the Prince Edward Island illustration stations. The digestible nutrients of the three crops are calculated from Morrison as quoted in Report No. 28 of the National Research Council.

A COMPARISON OF THE COST OF NUTRIENTS IN OATS, BARLEY AND WHEAT

Crop	Number of tests	Number of years	Average			Average		Average	
			Bushels per acre	Cost per acre	Cost per bush.	Pounds per acre	Cost per lb.	Digest. nut. lb. per acre	Cost of dig. nut. per cwt.
				$ cts.	$ cts.		$ cts.		$ cts.
Oats	81	11	44·3	23 48	0 53	1,506·2	1 56	1,060·36	2 21
Barley	36	10	31·7	20 97	0 66	1,524·9	1 38	1,210·77	1 73
Wheat	43	9	17·1	29 24	1 71	1,026·0	2 83	831·06	3 52

These figures indicate that nutrients have been produced more cheaply in barley than in oats, and that wheat has been a much more expensive feed than either.

Poultry Improvement

The poultry improvement work on the illustration stations has been reorganized in the past few years. The chicks are reared on clean land, culled and blood tested in the fall and mated with desirable male birds. Eggs from these flocks are in keen demand for hatching purposes, and each station becomes a community breeding centre. In subsequent years each operator maintains his own breeding flock, while annual blood testing and culling continue. All stations but one carry Barred Rocks.

An average of over 14,000 hatching eggs per year have been furnished by 11 stations in the past two seasons. A substantial number of cockerels and pullets have also been sold to neighbours.

The following is a summary of the flock records:—

SUMMARY OF RECORDS OF BARRED ROCK FLOCKS ON ILLUSTRATION STATIONS

Year	Number of stations	Average size of flock	Average eggs per bird
1935	5	66·7	141·6
1936	8	72·6	149·1
1937	6	66·3	146·2

Live Stock Improvement

Quality of live stock is more difficult to measure than quality of crops, as a rise or fall in dairy production reflects not only the ability of the cow herself, but also the quantity and quality of the ration. The effect of seasonal conditions on the food supply frequently masks any change in the producing ability of the herd. Nevertheless definite progress has been made in fixing the breed type in the grade herds on the stations through the use of pure-bred sires. In 1934 the average milk production was 5,427 pounds; in 1935, it was 6,029 pounds; in 1936, it was 6,609 pounds and in 1937. the milk produced per cow was 5,759 pounds.

PROGRESS REPORT ON ILLUSTRATION STATIONS IN NOVA SCOTIA 1934 TO 1937

F. B. Kinsman, B.S.A., Supervisor

There are 18 illustration stations operating in the province of Nova Scotia. During the four-year period 1934-37, 13 of these stations have conducted work on a field scale with field crops, improvement of permanent pastures, the effect of varying amounts of chemical fertilizer, varying rates of manure when used alone and when combined with fertilizer, the effect of ground limestone, and the use of boron in controlling brown-heart. In addition, all of these farms have been measured and laid out on a systematic rotation basis, developed in such a way as to meet practical problems with respect to feed growing and live stock breeding.

In addition, special investigations have been carried on at Port Mouton, Queens county, in co-operation with J. W. Willis, and at Dunvegan, Inverness county, with R. McRae, relating to cranberry production problems.

Three new stations were established in the fall of 1937, namely at Groves Point, Middle Manchester, and South Brookfield. Active work will be undertaken on each of these in the spring of 1938.

In addition to those already mentioned, illustration station work is being conducted at the following points in co-operation with the farmers named:—

Syndey River	Melvin Moreshead
Christmas Island	J. A. McNeil
North East Margaree	T. E. Ross
Mabou	E. C. Hawley
Heatherton	D. W. Grant
Knoydart	D. M. McDonald
Salt Springs	Fred Setchell
Middle Musquodoboit	R. B. McCurdy
Newport	Charles Zwicker
Lilydale	W. I. Faulkenham
Springfield	Maynard Grimm
Meteghan Centre	Albert J. Comeau
Chegoggin	L. Douglas Knight

Description and Organization of Station Farms

Sydney River, Cape Breton County

Moreshead Brothers, Operators

This station presents a major problem in farm layout. To the original farm another farm, known as the Sydney Hotel farm and comprising 50 acres of tillage land, has been added, thus making a total of 100 acres lying on the south side of the main highway. In reorganizing the whole farm, six fields were laid off on the south side of the road, five of which are being used in the production of crops. The sixth field which is somewhat broken, is being used for a permanent pasture. The farm is undulating, with a number of low areas. These areas have been underdrained which entailed considerable work. Old fences have been removed, as well as rock piles and bushes along the fences. A five-year rotation has been established as follows: Grain alone; root crop including turnips, potatoes, cabbage and carrots; grain seeded; clover hay; timothy hay. Grade Holstein cattle, Yorkshire swine and Barred Rock fowl are kept. The operators win many prizes at the County Fair with their live stock. Work has

been undertaken to place early turnips on the market, so far with some success. Painting the farm buildings, erecting a poultry house and planting shrubbery have added greatly to the appearance. A field day was held at this station in 1937.

CHRISTMAS ISLAND, CAPE BRETON COUNTY

J. A. McNeil, Operator

This station is typical of the district. The farm is cut by low swampy land which rises gradually to the higher land on either side. The soil is heavy loam and retentive of moisture. A four-year rotation is established on six acres in which the crop sequence is: Roots including turnips and potatoes; grain seeded; clover hay; timothy hay. Considerable work has been done with fertilizers at this station. The soil shows a decided shortage of phosphoric acid and lime, and it was impossible to produce clovers until these elements were added. Grade Ayrshire cattle, Yorkshire swine and Barred Rock poultry are kept. Whole milk was sold for the first time to the Sydney market this season. Profitable trade has been worked up in the sale of eggs as well as cockerels for hatching and breeding purposes. Pits for the successful keeping of turnips which are offered for sale in May have proved a financial success. Improvements have been made by painting the house and establishing shrubbery, whitewashing the barn and remodelling the poultry house.

NORTH EAST MARGAREE, INVERNESS COUNTY

Thomas E. Ross, Operator

This farm, situated in the Margaree valley, now has the entire 50 acres of tillage land under a five-year rotation. Previous to 1936 the area under supervision was only 18 acres. The rotation followed here is: Grain alone; root crop; grain seeded; clover hay; timothy hay. The farm buildings which are well back from the main highway have been recently painted and the house has been remodelled. Alfalfa has proved a success on this soil, which is a light to medium loam, and two seasonal cuttings have given four and three-quarter tons per acre. In the regular grass mixture three pounds of alfalfa seed has been added, giving increased yields. The operator here has a market for early turnips and finds the variety Ditmars satisfactory, when sown early. Treating the land with 15 pounds of boron per acre has given 93 per cent control of brown-heart. The hoed crop has increased from three to seven acres. Grade Ayrshire cows, a pure-bred Ayrshire bull, Yorkshire swine, and 100 Barred Rock laying pullets are kept. Fertilizing of pasture areas has been carried on, the fertilized areas giving one-third more grazing days than those unfertilized. Limestone is necessary in this soil to promote clover growth. Shrubbery has been planted to improve the general appearance of the farm buildings.

MABOU, INVERNESS COUNTY

Edmund C. Hawley, Operator

Up to 1935 only eight acres of this farm were devoted to illustration station work. Since then, the entire tillage land of 50 acres has been developed. The soil is of a light medium loam, slightly undulating. In reorganizing the whole farm layout a five-year rotation has been established as follows: Oats alone; root crop, including turnips, potatoes and mangels; grain seeded; clover hay; timothy hay. Each field runs to the main highway and can be observed by the farming public. Important work has been conducted with the use of commercial fertilizers and from one to five tons of marl per acre. The increase in clover hay from these applications has been nearly proportional to the rates of application. Where no marl was applied it was practically impossible to

develop satisfactory clover growth, even where barnyard manure had been applied. As a result of the studies at this station, 4,000 tons of marl were used by the farmers in this district in 1935. A grading-up process has been undertaken with grade Guernsey cattle and Shropshire sheep. The buildings are in fair condition. The barn was painted in 1935 and the house was painted in 1936. Shrubbery and perennials have been planted in order to present a pleasing appearance about the house.

HEATHERTON, ANTIGONISH COUNTY

D. W. Grant, Operator

This station is similar to most farms in Antigonish county. The land is of a rolling nature with the soil in a fair state of fertility, being a medium to heavy loam fairly retentive of moisture. In the new layout all the fields, comprising 50 acres, are on the north side of the main highway. Two cultivated fields, ten acres each, and a fertilized pasture area are west of the Pomquet road. Two 10-acre fields slope from the main road to the buildings, the other field is at the rear of the farm. A five-year rotation has been established as follows: Grain alone; root crop, including turnips and potatoes; grain seeded; clover hay; timothy hay. Work with boron to control brown-heart of turnips is a feature here. Ten pounds of boron applied per acre broadcast controlled brown-heart to the extent of 94 per cent. Little or no difference could be noticed by heavier applications. Garnet wheat is grown successfully, and since its introduction, practically every farmer in Antigonish and Guysborough counties is producing this variety. Although it is somewhat harder to temper than other wheats yet the yield is much better. Alfalfa is being successfully grown by the use of marl, barnyard manure and superphosphate. Two cuttings per season are possible, leaving a good substantial growth to go into winter. Four and one-quarter tons per acre have been harvested from these alfalfa areas. Grade Guernsey cattle, pure-bred Yorkshire swine and Barred Rock fowl are being kept. Hatching eggs are sold to commercial hatcheries. The house was painted in 1936, and the establishment of shrubbery and a perennial border has added greatly to the general appearance of the home.

KNOYDART, ANTIGONISH COUNTY

D. M. McDonald, Operator

This station consists of large areas, considerable of which are in only a fair state of fertility. The main highway divides the farm about equally. Thirty acres situated on the north side of the main highway run to the Northumberland strait, the remaining twenty acres are on the south side, together with the pasture. The buildings are set in from the road 300 yards. The land rises gradually from the shore line toward the top of the mountain. This soil varies but little, practically all consisting of a medium to heavy clay. In the new layout five fields of ten acres each have been established, three are on the north side of the main highway, with a permanent pasture, and two are on the south side. A five-year rotation has been established in which the crop sequence is: Grain alone; roots, including turnips, mangels, potatoes, corn and supplementary feed; grain seeded; clover hay; timothy hay. Grade Ayrshire cattle, pure-bred Yorkshire swine, Bronze turkeys, and Toulouse geese are kept. Activity has been directed toward increasing the hoed crops and improving the live stock. When the station started, no turnips were produced; this year four acres were grown. Special attention is being paid to growing turnips for the early market. Improvements have been made to the farm buildings, the barn and house have been regularly painted, and shrubs have been set out. This season electric lights were installed.

SALT SPRINGS, PICTOU COUNTY

Fred Setchell, Operator

At this station the main highway between Truro and New Glasgow divides the farm. The tillage land is on the south side of the highway but the regular pasture and the fertilized pasture areas are on the north side nearer the barn. In the new plan a road 15 feet wide runs through the centre of the tillage land on the south side of the road. The farm land is slightly undulating, with a soil which varies from a heavy loam, very retentive of moisture and requiring drainage in spots, to a gravelly soil near the river bed. In the new farm layout a five-year rotation has been established on the 40 acres of tillage land, in which the crop sequence is as follows: Grain alone; root crop, including turnips, potatoes, mangels, and corn; grain seeded; clover hay; timothy hay. Careful work is being done in the breeding and development of the herd of pure-bred Jersey cattle. There are three well-established alfalfa fields which receive certain fertilizer treatments in order to determine the best method for maintaining a good stand. Considerable improvement has been made in the buildings and surroundings, and shortly after the establishment of this station a new barn was erected. During the last year the house was thoroughly renovated and painted, and modern conveniences were installed. A new lawn has been made and shrubbery and other plants have been set out, greatly improving the appearance of the buildings.

MIDDLE MUSQUODOBOIT, HALIFAX COUNTY

R. B. McCurdy, Operator

Both the tillage land, consisting of 48 acres in the new layout, and the pasture land, are situated on the north side of the main highway. Six acres on the south side of the highway are used for alfalfa and garden crops. The soil is a medium to heavy loam and requires drainage. A fertilized pasture area is provided. The pasture problem is a serious one due to heaving of the soil in spring. A four-year rotation is being conducted here as follows: Hoed crop; grain seeded; clover hay; timothy hay. Underdrainage has been installed in two fields. The soil is retentive of moisture and in certain seasons the growing of root crops is impossible. The underdrains established have permitted hoed crops to be grown and helped the grain and clover yields materially. Work has been conducted on pasture fields to determine the chemical deficiency of the soil. Two tons of ground limestone and 500 pounds of 2-12-6 fertilizer per acre have given the most economical results with grain and hay, besides leaving a better sod for pasturage. Alfalfa is being grown successfully on the lighter soil. Grade Guernseys and pure-bred Barred Rock fowl are kept. Steady progress is being made in milk and butterfat yields. Whole milk is shipped to Dartmouth. The house has been recently painted and shrubs have been planted to improve the appearance of the station. Many prizes have been obtained at the County Exhibition on roots and vegetables.

NEWPORT, HANTS COUNTY

Charles Zwicker, Operator

At this station the farm land is situated all on the north side of the main road. The soil which consists of a medium to heavy loam is retentive of moisture and is in a good state of fertility. This is one of the two stations in the province which does not require ground limestone for satisfactory clover crops. In the new layout a field road leads through the centre of the farm. Three fields have been conveniently laid out on the east side of the field road and two on the west side. A five-year rotation has been established on 40 acres;

Grain alone; root crop including turnips, mangels, potatoes, corn and supplementary feed; grain seeded; clover hay; timothy hay. Three pounds of alfalfa is added to the grass seed mixture. The stand of alfalfa has been 15 per cent. The grade Guernsey cattle are being built up by the use of a pure-bred Guernsey bull. Pure-bred Yorkshire swine and Barred Rock fowl are also kept. This station has increased yearly in production. Eighty-five per cent of the mill feeds fed to the live stock is produced on this farm. Seed grain is featured and annually five to six hundred bushels are sold to the farmers in the county. Improvement has been made to the barn by establishing a well-equipped dairy stable, including drinking bowls for live stock, and adding more windows to make the stable lighter. Both the barn and house have been recently painted, a lawn has been developed, and shrubbery has been planted to give the place a more tidy appearance.

SPRINGFIELD, ANNAPOLIS COUNTY

Maynard Grimm, Operator

This station is typical of the district. The land is of a sloping nature and the soil consists of medium to heavy loam quite retentive of moisture. This heavy type of soil often makes seeding late. The farm buildings and two fields are situated on the east side of the main highway. The other three fields are on the west side. A five-year rotation is conducted on these 25 acres of tillage land, the sequence of which is: Grain alone; root crop including turnips, potatoes, mangels and corn; grain seeded; clover hay; timothy hay. Work with boron in the control of brown-heart has been an active feature. The club-root-resistant variety of turnip, Wilhelmsburger, has been a great help in this district in the production of good yields of turnips. Dairying is one of the chief features and a grading-up process has been undertaken. A pure-bred Shorthorn bull has been used for this improvement work with good success, and grade Shorthorn cows are kept. The buildings are being kept in splendid condition. All the buildings are being regularly painted, and considerable work has been undertaken in beautifying the home surroundings by placing shrubbery and developing a new lawn.

METEGHAN CENTRE, DIGBY COUNTY

Albert J. Comeau, Operator

The main highway divides this station, with the land on the north side sloping toward and touching the bay of Fundy. Work in this district has been interesting in that new features have been satisfactorily introduced. A five-year rotation is run on an area of 16 acres, comprising the entire farm, with the exception of pasturage. The narrow road frontage is typical of this district. The type of soil is a light loam, neutral to slightly alkaline, with good drainage, and especially adapted to alfalfa growing. By using three pounds of alfalfa per acre with the regular grass seed mixture in the timothy hay, the forage consists of 60 per cent alfalfa. Other fields have been sown entirely to alfalfa, and in two cuttings a season produced five and one-quarter tons of cured alfalfa hay per acre. Permanent fields of this crop will be an outstanding feature at this station. A five-year rotation has been established in which the crop sequence is: Grain alone; hoed crop including potatoes, mangels, turnips and corn; grain seeded; clover hay, timothy hay. Strawberries and new varieties of vegetables are being grown. Two new poultry houses were erected two years ago, and now 300 pure-bred Barred Rock pullets are kept. Hatching eggs are sold to commercial hatcheries, and cockerels are sold for breeding purposes. The root cellar has been enlarged, the barn has been repaired and painted, and shrubbery has been planted around the barn and house to make the general surroundings more attractive.

CHEGOGGIN, YARMOUTH COUNTY

J. C. Corning, Operator

Before this station was reorganized, six two-acre areas were used for illustration station work. In the new layout 40 acres are devoted to the work and lie on the east side of the highway. A field road runs along the north side of two fields, two fields face the main road and one field is at the rear. A fertilized pasture is conveniently situated for grazing. The soil is a medium loam and in fair to good state of fertility. The farm is mostly level, with the exception of sloping hills. A five-year rotation has been established in which the crop sequence is: Grain alone; root crop including potatoes, mangels, corn; grain seeded; clover hay; timothy hay. Pure-bred Jersey cattle and pure-bred Barred Rock fowl are kept. The Jersey herd has been a constant winner at the Yarmouth county shows. Success has been attained in the growing of turnip seed, and in the sale of dairy products. Changes have been made by removing a few old buildings, renovating and painting the barns, painting the house and planting shrubbery, which has added much to the general appearance of the farm buildings.

LILYDALE, LUNENBURG COUNTY

W. I. Faulkenham, Operator

Twelve acres were originally devoted to illustration station work. In the new plan of organization the tillage land comprising 40 acres is being utilized. A central field road runs to the rear of the farm, three eight-acre fields lie on one side and two eight-acre fields lie on the other side of this road. These fields all come to the main highway. The pasture is near the farm buildings. A permanent fertilized pasture has been established. The front of the farm is fairly level while the rear is slightly hilly. The soil is medium to heavy loam of only fair fertility. A five-year rotation is conducted, in which the crop sequence is: Grain alone; roots including turnips, mangels, potatoes and corn; grain seeded; clover hay; timothy hay. A herd of 27 milk cows, mostly grade Jersey and Guernsey, and 600 Barred Rock pullets are kept. Whole milk is sold in the district and hatching eggs are sold to commercial hatcheries and to the farmers. The farm buildings are particularly well kept. A dairy has been installed in the basement of the house, a milking machine has been placed in the barn, and the root cellar has been enlarged. A new lawn with a perennial border and shrubbery recently planted adds to the appearance of this station.

Home Orchard Tests

Ten years ago half an acre of orchard was set out on the illustration stations at Sydney River, Christmas Island, North East Margaree, Heatherton, Middle Musquodoboit, Newport and Mabou. The object was to determine the practicability of growing fruit for home use in sections other than the specialized fruit growing districts in the province, and to ascertain the suitability of certain varieties for these areas. A suitable location was selected at each station and young apple trees consisting of early fall, late fall, and winter varieties were planted. The growth of these trees at practically all stations has been very satisfactory, but there have been losses due to winter injury and other sources.

The practice followed in the cultivation was to hoe around the young trees after they were first set out until the root system extended into the soil. Since then a narrow strip has been ploughed and kept cultivated during the growing season up until the last of June. In some cases a hoed crop such as potatoes or beans has been planted between the trees. Because of more suitable soil conditions and cultivation, some orchards have developed more rapidly than others.

This has been particularly true where a hoed crop has been planted for two or three years in succession in these young growing orchards. The lack of suitable spraying equipment has presented a problem in insect and disease control.

The fertilizers used in developing these orchards, up until three years ago, have been light applications of manure in conjunction with a small quantity of nitrogenous fertilizers. Since then a light application of manure together with a complete fertilizer has been used with success. The average terminal growth has been from ten to twelve inches. These orchards have for the last two or three years produced some very good quality fruit. The earlier-producing varieties have been the Wealthy and the McIntosh.

Apple tree of the McIntosh variety planted seven years ago.

Small Fruits.—At all stations the growing of small fruits is gaining in popularity. Strawberries appear to be the most popular of the small fruits on the various illustration stations. Each operator produces not only enough cultivated strawberries for his own use but is increasing yearly his sales to the neighbouring towns and villages. The Senator Dunlap variety has proved most satisfactory. Several of the operators are growing from one to two acres of strawberries. Raspberry canes of the Viking variety, which is fairly immune to mosaic and leafroll, have been set out at several of these stations. Once a plantation is started it is very easy to extend it by using canes from the established beds.

Cranberry Investigations

In the spring of 1933, cranberry investigations were started at two places in Nova Scotia, Port Mouton and Dunvegan. The objective was to find the most practical method of procedure, also the cost of turfing, ditching, levelling, sanding and planting of the vines; and to determine if it is possible to rejuvenate neglected cranberry growing areas by sanding.

Port Mouton.—The development of an acre of cranberry bog was started at Port Mouton, Queens county. This area was ditched, turfed, levelled and sanded. During the winters of 1934 and 1935 sand was hauled by truck and

distributed over the bog to a depth of three inches after it had frozen. Planting took place the following May and was finished on the 28th. Cuttings were planted from an adjoining bog, also vines containing roots from the Broad River section. The berries growing wild in the Broad River section are large and have a deep red colour. After the vines were planted, the area was flooded to firmly settle the sand around the plants. The vines from both cuttings and roots, have done exceptionally well since planting. They are free from false blossom and have made uniform growth, and now practically cover the ground surface. During the season of 1936 this area was carefully hoed, weeded, and now presents a splendid appearance. To perform the various tasks, the hours of labour consumed on the acre of old bog were distributed as follows: ditching, 54 hours; turfing, 977¼ hours; hauling sand seven-tenths of a mile from pit to bog by truck and spreading sand, 584½ hours; cutting vines, 34 hours; planting vines, 117 hours.

This season, 1937, two bushels of cranberries were picked. These berries were from rooted vines rather than cuttings. It would appear that vines planted with roots attached come into fruiting earlier than vines containing no roots.

Dunvegan.—The work in cranberry culture conducted at Dunvegan has been quite different in nature from that outlined at Port Mouton. In the Dunvegan district cranberries grow wild on hillside pastures and fields. Here, two methods of renovation were compared. On one the shrubs were removed, the land fertilized and sanded on top of the sod. On another section the area was ploughed during the summer, then sanded and vined the following spring. The fertilizers appeared to increase grass and weed growth, with no noticeable favourable effect on the cranberry vines.

From the work done in the past it would appear that the success of developing cranberry areas on sand without peat has been somewhat disappointing. The operator, however, ditched and scalped a quarter-acre area on a peat bog, which was sanded and planted in 1936. This type of bog is much more easily handled. The weed growth is easily controlled, and the growth has been rapid. This type of bog appears at the present time to give the most promise of being developed for cranberry growing in this district.

Live Stock Improvement

On the illustration stations in Nova Scotia, the principal revenue is derived from the sale of dairy products. It is, therefore, important to weed out the lowest producers, on the basis of production records, and to feed the better producing individuals in such a way as to develop production to the full. This would include not only feeding a well-balanced ration during the winter months, but providing adequate pasturage during the grazing season. The improvement of pastures on the stations by the application of chemical fertilizers has contributed to the increased milk flow obtained from the different herds. In the milk production table which follows, it has been noted that there is an increased production from ten herds with respect to the average production, as well as that from the lowest producing individuals, while at 11 stations an increase in the milk production was obtained from the highest producing cows.

MILK PRODUCTION BY STATIONS

Station	Breed	Number of cows milked	Average days lactation	Average milk production	Average percent butter-fat	Highest cow production	Lowest cow production
				lb.	%	lb.	lb.
Sydney River	Holstein grade	22	305	8,462·4	4·0	10,896·1	7,233·1
Christmas Island	Guernsey grade	6	300	5,132·6	4·1	7,236·4	4,836·6
North East Margaree	Holstein grade	20	304	6,669·3	4·8	8,776·7	5,349·1
Mabou	Guernsey grade	9	305	5,009·1	4·5	7,123·0	4,479·3
Heatherton	Holstein grade	13	304	6,334·2	3·8	7,869·3	5,654·6
Knoydart	Ayrshire grade and Shorthorn	15	305	5,939·2	4·7	7,632·4	5,168·3
Salt Springs	Jersey pure-bred	17	304	5,160·1	5·0	9,694·3	4,780·9
Middle Musquodoboit	Guernsey grade	16	304	6,088·2	4·6	9,544·4	5,009·1
Newport	Guernsey grade	16	305	6,178·3	4·9	8,432·8	5,264·3
Lilydale	Jersey and Ayrshire grade	25	305	6,421·2	4·9	9,639·3	5,431·4
Springfield	Jersey and Shorthorn	10	305	6,592·7	4·1	7,936·3	5,639·2
Meteghan Centre	Guernsey grade	4	300	5,136·5	4·8	7,435·2	4,395·0
Chegoggin	Jersey pure-bred	16	305	6,589·3	5·1	8,669·3	5,693·7

Within the past two years a pure-bred Guernsey bull was purchased by the operator at Middle Musquodoboit, and a pure-bred Jersey by each of the operators at Chegoggin and Salt Springs. These herd sires were purchased not only from the standpoint of type, but also the ancestry and production of their dams. At the present time, pure-bred sires are owned and maintained by the operators at Sydney River, North East Margaree, Knoydart, Salt Springs, Middle Musquodoboit, Newport, Lilydale, Springfield and Chegoggin. The stations at Meteghan Centre, Heatherton and Mabou have access to pure-bred sires which are owned by neighbouring farmers in their respective districts. At the Christmas Island station a pure-bred Ayrshire sire is available for the operator as well as his neighbours, having been procured through the Dominion Bull Loaning Policy.

Thus through improved breeding, feeding and sanitation, a concerted effort is being made to increase the milk production of the different herds on farms operating as illustration stations.

Poultry

Seven years of steady progress has marked the poultry work on the illustration stations. During that time the average-sized flock ranged from ten to twelve hens per station. This season, 3,250 day-old chicks were reared on the 13 illustration stations in Nova Scotia. Out of 2,300 day-old chicks, 800 were obtained from the Experimental Farms System, the remainder being from the operators' own eggs which were incubated at commercial hatcheries.

There have been nine new poultry houses erected by the operators during the past four years. These houses have a capacity of 100 to 500 laying pullets. The erecting of these poultry houses in districts where poultry and egg production was formerly not carried on extensively, has encouraged the re-modelling of poultry houses, and in some cases the building of a new poultry house from plans supplied by the Poultry Division, Central Experimental Farm, Ottawa.

All the pullets on the stations have been blood-tested for pullorum with the exception of those on Cape Breton Island. This season no reactors were found.

In Cape Breton districts some of the operators are 22 miles from a railroad, as a result it is not considered economically possible to sell hatching eggs to the commercial hatcheries. On the mainland during 1937, however, 14,068 hatching eggs were sold to commercial hatcheries, and 2,469 were sold or exchanged to farmers in districts near the stations.

The sale of cockerels dropped off considerably during the season of 1937 as compared with previous years. The sale of cockerels in 1933 numbered 205, this season 57 were sold for breeding purposes. This change is due to the purchase of day-old chicks rather than lack of interest in the poultry industry. Over

100 R.O.P. cockerels were purchased by the operators from the Experimental Farms System. This fall on the farms in Nova Scotia co-operating in illustration station work, 2,150 pullets went into laying quarters, the size of the individual flocks varying from one to five hundred birds.

Turnips

From trials conducted on the illustration stations in Nova Scotia, turnips have been found to be the most economically grown succulent crop for the feeding of live stock. As a result, the acreage of hoed crop is increasing yearly on the stations, as well as in the surrounding districts.

The Ditmars variety is the one chiefly grown, especially where there is no club-root in the soil. At some of the stations, club-root is severe, necessitating the growing of resistant varieties. During the spring of 1933, 13 club-root-resistant turnip varieties were tested to establish their comparative immunity. Actual counts were made during the growing season shortly after thinning, as to the number of plants in each row, also at the time of harvesting each root was counted and examined for club-root or nodules on the roots. Thus the percentage of club-root present was established. Of the different varieties tested, two were outstanding; namely Wilhelmsburger and Herning which were found to be resistant to a high degree. In the spring of 1935 these varieties were tested at two stations, Springfield and Middle Musquodoboit, where no noticeable club-root was observed previous to that year. Although sown to obtain yield data only, upon examination at the time of pulling at Springfield, it was observed most of the varieties, except Wilhelmsburger, had nodules formed on the roots. At Middle Musquodoboit, however, the crop was absolutely free, including the Ditmars variety which was sown as a check. The Ditmars variety gave the highest yield of 24·8 tons per acre, the Wilhelmsburger gave the next largest yield with 22·6 tons per acre, while the yields of the other varieties were: Bangholm Sludstrup, Hart, 18·2 tons; Bangholm Herning, Hart, 21·0 tons; Bangholm, Kentville, 15·6 tons; Bangholm, Charlottetown, 17·4 tons; Bangholm, Nappan, 14·2 tons. Turnips seed is being produced from the Wilhelmsburger by some of the operators.

Club-root test at Upper Stewiacke, N.S. The missing row resulted from a severe infestation among susceptible varieties. Wilhelmsburger proved to be highly resistant.

Labour, fertilizers, and charge for manure represent a large portion of the cost in the production of turnips. On these stations the cost of hauling and storing turnips was from 20 to 26 cents per ton, while the cost of horse labour and the teamster varied from $13 to $23 per acre. Forty per cent of the cost of manure and fifty-five per cent of the cost of chemical fertilizers is charged against the crop to which it is applied. The turnip crop and other hoed crops are charged on that basis. The cost of added fertility in the form of manure or chemical fertilizer ranged from $7.50 to $13 per acre.

The average turnip yield on the 13 stations this year was 26·2 tons and the cost of production $1.80 per ton, compared with the average yield over a period varying from two to sixteen years, of 22·7 tons costing $3.11 per ton.

Clover Hay Growing

Considerable effort has been expended in studying and promoting soil conditions most conducive to the growing of clover hay on the illustration stations. Due to the varying soil types which range from light loam to heavy clay, it has not been possible in the past to obtain satisfactory clover yields at all stations. Where farmyard manure was applied to the hoed crops, grain sown the following year and seeded to the regular grass mixture containing eight pounds timothy, five pounds red clover, three pounds alsike, and three pounds alfalfa, the yields of clover hay were not altogether as expected. Soil treatments with varying amounts and kinds of commercial fertilizers and ground limestone following the application of manure have made it possible to procure very satisfactory yields of clover hay. Particularly is this true where ground limestone or marl has been used when applied either to the hoed crop or at the time of sowing to grain and seeding. Success has been obtained in the growing of clovers where ground limestone at the rate of two tons per acre and 500 pounds superphosphate was applied following the hoed crop where 10 to 15 tons of manure had been applied.

The Effect of Nitrogenous Fertilizers on Grasslands

The application of nitrogenous fertilizers on grasslands has been an annual study at the illustration stations in Nova Scotia for 14 years. Various forms of nitrogenous fertilizers have been used, principally nitrate of soda and sulphate of ammonia. These were applied to the timothy sods in order to obtain their effect on hay yields. It has been found that the most economical application was 115 pounds of sulphate of ammonia and 150 pounds of nitrate of soda. Increased yields were obtained with heavier applications made, but at a higher relative cost. These applications of nitrate of soda and sulphate of ammonia have been made as early in May as possible or just as soon as growth starts. The areas were staked into three plots and the sulphate of ammonia plot compared with the nitrate of soda plot, leaving an area untreated as a check plot.

The average increase in hay this season from the use of nitrogenous fertilizers was: at Knoydart, 3,027 pounds; at Sydney River, 2,421 pounds; at North East Margaree, 2,204 pounds; at Salt Springs, 2,178 pounds; at Meteghan Centre, 1,781 pounds; at Heatherton, 1,379 pounds; at Springfield, 1,341 pounds; at Mabou, 1,324 pounds; at Middle Musquodoboit, 1,085 pounds; at Chegoggin, 1,008 pounds; at Christmas Island, 906 pounds; at Lilydale, 488 pounds; and at Newport, 380 pounds, over the unfertilized areas which received no application of nitrate of soda or sulphate of ammonia.

On all stations where nitrogenous fertilizers have been applied, an average increased yield of 1,502 pounds of timothy hay per acre was obtained in 1937. At six stations the average increase over a 14-year period due to nitrogenous fertilizers was: at Heatherton, 1,069 pounds; at Christmas Island, 1,478 pounds; at North East Margaree, 625 pounds; at Newport, 1,436 pounds; at Middle Musquodoboit, 947 pounds; and at Sydney River, 1,392 pounds, over the unfertilized areas. At three stations more recently established, the average

increase over a five-year period due to nitrogenous fertilizers was: at Meteghan Centre, 1,348 pounds; at Lilydale, 1,175 pounds; and at Chegoggin, 1,152 pounds, over the unfertilized areas.

The field on the right received an application of nitrogenous fertilizer while that on the left was the untreated or check area.

Pasture Improvement by the Use of Commercial Fertilizers

Seven pasture improvement tests are being conducted on the illustration stations in Nova Scotia. These fertilized pasture areas were started in 1932 at North East Margaree, Heatherton, Salt Springs, Middle Musquodoboit, Lilydale, Chegoggin, and Knoydart. Most of these pasture areas had not been ploughed for 18 to 30 years. Three, one-and-one-half-acre areas each were selected and fenced separately. Treatments given were as follows: on one area 700 pounds of 4-8-7 and two tons of ground limestone, on another area 700 pounds of 4-8-7 alone, and one area was left unfertilized. These areas have received each spring, in addition, 115 pounds of sulphate of ammonia per acre just as growth was starting. In each case the cows were allowed access to a brook or spring water. Rotational grazing was followed in order to determine the increased milk yields as well as the comparative grazing days from each area. It has been possible to turn the stock on the fertilized pasture from 11 to 13 days earlier than on the unfertilized. This season at each of the seven stations, two cages, 12 feet square, were erected, one enclosing a small section of the fertilized area, the other being placed on the check plot. The herbage was cut in the cages three times during the grazing season. The average weight of green herbage from the seven tests amounted to 15,757 pounds from the fertilized pasture and 3,328 pounds where no fertilizer was applied.

Since the establishment of these fertilized pastures the flora has changed considerably. A solid mat of clovers has developed on all fertilized areas but this was more pronounced on areas receiving ground limestone in addition to chemical fertilizer. Different seasons bring about varying results due to the period of dry weather which usually prevails in July and August. The 1937 season was very favourable for grazing, frequent rains promoted growth and prolonged the grazing period. The weed population has been considerably reduced, particularly king-devil.

The following table records the season's results in grazing days per acre, carrying capacity, and increased milk production from the fertilized pastures. It also gives the six-year average from 1932 to 1937.

RESULTS FROM FERTILIZERS ON PASTURES

Location of station	Grazing days per acre		Carrying capacity per acre	
	Fertilized	Check	Fertilized	Check
North East Margaree	66	42	0·54	0·34
Heatherton	68	15	0·56	0·12
Salt Springs	120	80	0·98	0·66
Middle Musquodoboit	168	47	1·38	0·39
Lilydale	230	46	1·89	0·38
Chegoggin	280	160	2·30	1·31
Knoydart	80	27	0·66	0·22
Average	144·6	59·6	1·19	0·49
Six-year average, 1932 to 1937	140·3	73·4	1·97	0·90

A survey of the above table reveals that in 1937 there was an average of 85 grazing days more on the fertilized than on the unfertilized areas. The average carrying capacity per acre was 0·70 more on the fertilized areas. The average milk production from the seven stations was increased by 1921·6 pounds from the fertilized areas. In 1937 the grazing period was 4·3 days longer on the fertilized areas than the six-year average.

From the fertilized pasture trials conducted on the illustration stations it has been found that with poor grazing management the grass increased and the clovers were depressed even though the fertility needs of the soil were met. On areas which had received applications of complete fertilizer and lime, close grazing with rest periods has resulted in the most desirable sod and herbage improvement, including an increase in white clover.

Brown-Heart Trials with Boron on Turnips

Co-operating with the committee on brown-heart investigations in turnips, the preliminary work conducted on the experimental farms was extended to seven illustration stations in Nova Scotia in 1935. That season a uniform section in the turnip field was staked, divided into two sections, and given the following manurial, chemical fertilizer, or boron treatments.

Row 1—Section 1: 1,000 lb. 2-12-6
Section 2: 500 lb. 2-12-6, 20 tons manure
Row 2—Section 1: 1,000 lb. 2-12-6, 15 lb. boron
Section 2: 20 tons manure
Row 3—Section 1: 20 tons manure
Section 2: 20 tons manure, 15 lb. boron
Row 4—Section 1: 20 tons manure, 15 lb. boron
Section 2: 1,000 lb. 2-12-6, 15 lb. boron
Row 5—Section 1: 20 tons manure; 500 lb. 2-12-6
Section 2: 1,000 lb. 2-12-6

All the chemical treatments were applied directly in the drill. The application of manure was made in open drills, then covered with earth. At harvest time 100 roots from each plot were pulled, cut and examined for the prevalence of brown-heart, and notes recorded as to whether the infestation was very severe, severe, slight or the roots free from this physiological condition. The results of these tests showed that brown-heart of turnips was controlled to a large degree by the application of boron.

From the lead given in 1935, which indicated that boron was effective in controlling brown-heart, a new series of tests was put in on 12 illustration stations in 1936, studying the effect of boron when applied to the turnip crop at the rates

of 10, 20, 30, and 40 pounds per acre, in comparison with plots where no boron was used. The boron was broadcast after a well-prepared seed bed had been established, raking it in from three to four days prior to sowing the turnips. During the growing season there was no noticeable difference at any of the stations with respect to growth from the different rates of application, except at Springfield, where during the first part of July the under part of the leaves took on a milky to white discoloration. This continued for two weeks and then the leaves became normal in colour. At harvest time 100 roots were cut from each treatment in order to establish the percentage of control from the different applications. The average results from 12 stations where no boron was applied showed 39·3 per cent to be very severely affected with brown-heart, 12·2 per cent severe, 16·8 per cent slight, and 31·5 per cent free. With the ten-pound rate of boron application, 10·3 per cent were found to be very severely affected, 4·2 per cent severe, 9·7 per cent slight, and 75·8 per cent free. With the 15-pound boron application, 1·7 per cent were very severely affected, 2·2 per cent severe, 7·7 per cent slight, and 88·5 per cent free. With the 20-pound per acre application of boron, 8·3 per cent were very severely affected, 1·0 per cent severe, 1·8 per cent slight, and 88·8 per cent free. At the 30-pound rate per acre of boron, 8·3 per cent were very severely affected, 0·3 per cent severe, 0·7 per cent slight, and 90·7 per cent free. With the 40-pound per acre application of boron, 8·5 per cent were very severely affected, 0·2 per cent severe, 0·5 per cent slight and 90·8 per cent free. Summarizing the results, it was found that turnips receiving 10 pounds of boron per acre were 75·8 per cent free of disease; 15 pounds of boron, 88·5 per cent free; 20 pounds of boron, 88·8 per cent free; 30 pounds of boron, 90·7 per cent free; and 40 pounds of boron, 90·8 per cent free. These areas have been kept carefully staked and the residual effect of boron on succeeding crops is also being studied.

In 1937, based on previous years' experience, the practical application as to the use of boron was further tested at 13 illustration stations in Nova Scotia. Fifteen pounds of boron was applied to one acre of the turnip field at each point, and an adjoining area was left untreated as a check. Otherwise the fertilizer treatments were identical on both sections of the turnip field. The following table indicates the percentage control obtained on the different farms operating as illustration stations.

EFFECTS OF BORON APPLICATIONS ON TURNIPS

Station	Rate of boron application, per acre							
	No boron				15 pounds boron			
	V. Sv.	Sv.	Sl.	Fr.	V. Sv.	Sv.	Sl.	Fr.
	%	%	%	%	%	%	%	%
Sydney River	38·0	22·0	26·0	14·0	1·0	2·0	0·0	97·0
Christmas Island	25·0	25·0	28·0	22·0	0·0	0·0	6·0	94·0
North East Margaree	21·0	11·0	20·0	48·0	0·0	1·0	3·0	96·0
Mabou	15·0	30·0	6·0	49·0	0·0	0·0	0·0	100·0
Heatherton	69·0	26·0	0·0	5·0	0·0	2·0	1·0	97·0
Knoydart	70·0	9·0	1·0	20·0	4·0	6·0	7·0	83·0
Salt Springs	25·0	17·0	9·0	49·0	0·0	0·0	2·0	98·0
Middle Musquodoboit	73·0	10·0	2·0	15·0	0·0	0·0	0·0	100·0
Newport	11·0	9·0	10·0	70·0	2·0	0·0	2·0	96·0
Lilydale	15·0	16·0	10·0	59·0	1·0	2·0	0·0	97·0
Springfield	20·0	19·0	2·0	59·0	0·0	0·0	5·0	95·0
Meteghan Centre	10·0	13·0	11·0	66·0	1·0	1·0	3·0	95·0
Chegoggin	15·0	20·0	10·0	55·0	1·0	0·0	0·0	99·0
Averages	31·3	17·5	10·4	40·8	0·8	1·1	2·2	95·9

Legend: V. Sv. = Very Severe
Sv. = Severe
Sl. = Slight
Fr. = Free

From the results listed in the above table, and from those obtained in the rates-of-application test in 1936, it will be noted that the application of 15 pounds of boron in addition to the standard treatment of manure and chemical fertilizer gave a brown-heart control with turnips from 88·5 per cent to 95·9 per cent. Little or no economic advantage was obtained by applying a heavier application. At Knoydart the control has not been as effective as at the other stations.

Varying Amounts of Potash on Potatoes

In the spring of 1932, areas were selected at five of the illustration stations to study the influence of increasing the rate of applying potash in a mixture on land prior to growing potatoes. Five plots were used for these studies, each plot being wide enough to occupy five or more potato rows. The fertilizer applications were broadcast after the seed-bed had been carefully prepared, and the fertilizer harrowed in. Each plot received an application of chemical fertilizer made up of one of the following five formulae: 5-8-0, 5-8-4, 5-8-8, 5-8-12 and 5-8-16. There was considerable variation in soil types at the different stations, varying from a gravelly loam at Sydney River and a light loam at Northeast Margaree to a medium loam at Chegoggin and a clay loam at Newport and Lilydale.

The following table indicates the five-year average yield at the different stations from the fertilizer mixtures containing varying percentages of muriate of potash:—

EFFECTS OF POTASH APPLICATION ON POTATO YIELDS

Station	Five-year average yields per acre				
	5-8-0	5-8-4	5-8-8	5-8-12	5-8-16
	bush.	bush.	bush.	bush.	bush.
North East Margaree	276·9	328·6	369·7	400·5	444·4
Sydney River	260·5	239·1	239·2	250·3	246·6
Newport	188·7	227·9	256·7	284·4	272·5
Lilydale	170·0	204·2	245·5	235·1	248·5
Chegoggin	230·7	313·5	318·8	306·7	336·1

It will be noted that the general trend was that the potato yield increased with the heavier application of potash, and that the per cent increase was greatest in the mixture up to the 5-8-8 formula.

The Effect of Manure Alone and When Supplemented by Chemical Fertilizers on Farm Crops

Due to the limited quantity of manure available on many of the farms, it was deemed essential to ascertain the most economical means of supplementing this manure with chemical fertilizers. With this in mind, five manurial and chemical fertilizer treatments were laid down in 1933 on 13 Nova Scotia illustration stations. The five treatments were as follows:—

Plot 1—16 tons of manure.
Plot 2—16 tons of manure, 2 tons lime.
Plot 3—16 tons of manure, 300 pounds superphosphate.
Plot 4—8 tons manure, 400 pounds of 2-12-6 fertilizer.
Plot 5—8 tons manure, 600 pounds of 4-8-10 fertilizer.

The manure was spread broadcast and harrowed in, after which the ground limestone and commercial fertilizer were sown. In each case the fertilizers were applied crosswise of the turnip crop. In that way the effect of the different treatments on turnip growth could be ascertained by weighing. A four-year crop rotation of turnips, grain, clover hay and timothy was followed and the effect of these different manurial and fertilizer treatments was ascertained from the turnip crop as well as succeeding grain and hay crops.

Yields of turnips, oats, clover and timothy taken during the succeeding years from 1934 to 1937 indicate that in no case were highest yields obtained from the application of 16 tons of manure alone. From six of the 13 stations, turnips give the highest yield where 16 tons of manure and 300 pounds of superphosphate had been applied. In seven tests the highest grain yield came from the application of 8 tons of manure and 600 pounds of 4-8-10 fertilizer; five were obtained where 16 tons of manure and 300 pounds of superphosphate was applied. With clover hay the nine highest yields came from the application of 16 tons of manure and 2 tons of lime per acre. Five high yields from clover were also from the application of 16 tons of manure plus 300 pounds superphosphate. Similar trends were indicated in the response of timothy growth to the different treatments. From a study of the fertilizer mixtures applied, it will be noted that the available phosphate amounted to 48 pounds in the three treatments where chemical fertilizer was used. Further analysis also indicates that the turnip and oat yields responded very favourably to a combination of manure and superphosphate. Clover and timothy hay gave their highest percentage increase where lime was applied in conjunction with 16 tons of manure. It is also noteworthy that from the average of the 13 stations, manure alone, applied to the turnip crop at 16 tons per acre, gave a yield of 18·1 tons, whereas 8 tons of manure and 400 pounds of a 2-12-6 fertilizer yielded 21·6 tons, and 8 tons of manure and 600 pounds of a 4-8-10 fertilizer 22·6 tons. These trials indicate the practicability of using light applications of manure supplemented by a well-balanced chemical fertilizer compounded to meet the requirement of the specific crops which go to make up the farming rotation. The 2-12-6 and 4-8-10 mixtures have proved very practical and effective fertilizers in the tests on the Nova Scotia illustration stations in question.

Crop Yields and Their Cost of Production

Farmyard manure, chemical fertilizer and ground limestone give varying response in crop growth in different types of soil, depending on their formation, natural fertility, physical condition and drainage. A study of the cost of growing crops in Nova Scotia, based on a period of 18 years, indicates the close relation of cost to such factors as the original state of fertility, number of live stock, and the available supply of manure. On the 13 illustration stations, different soil types natural to the province are found. For the most part these stations were in a low state of fertility, yet with the knowledge obtained through fixed tests conducted during this period as to plant food deficiencies, it is now much easier to determine the soil requirements.

In the reorganizing and developing of the farm program on the different illustration stations, it would be well to mention that at several points hoed crops in particular have been grown on land in a lower-than-usual state of fertility. Old permanent pasture lands have been brought under crop, hence in some cases crops have been grown on land which has been in pasture for some years.

When compiling the costs as given in the following table, such factors as rental of land, taxes, use of machinery, cost of manure and fertilizer, cost of seed, twine, spray and other materials have been taken into consideration. Each operator keeps a daily record of the hours spent in ploughing, harrowing, seeding, cultivating, hoeing, raking, mowing or binding, as well as harvesting of all crops, including housing. The labour charges are calculated at prevailing rates for manual or horse labour in each district. Thus, in the per-bushel or per-ton cost presented, the operator and his family and team have been allowed wages at the prevailing rates.

The following table summarizes the cost of growing six of the most important farm crops on Nova Scotia farms. These crops have been grown in a four-, five-, or six-year rotation, depending on the cropping sequences followed at the different farms, and cover a period as indicated:—

Station	Potatoes					Turnips					Mangels		
	Number of years	Yield per acre		Cost per bushel		Number of years	Yield per acre		Cost per ton		Number of years	Yield per acre	
		1937	Average	1937	Average		1937	Average	1937	Average		1937	Average
		bush.	bush.	$ cts.	$ cts.		tons	tons	$ cts.	$ cts.		tons	tons
Sydney River	3	198·7	269·8	0 22	0 19	3	.....	28·4	.....	1 67	.....	.....	.....
Christmas Island	16	271·0	208·3	0 31	0 25	15	.....	14·6	.....	6 74	.....	.....	.....
North East Margaree	16	440·0	387·0	0 12	0 24	16	36·0	26·7	1 22	2 67	3	.....	26·8
Mabou	6	195·4	263·6	0 25	0 30	9	21·7	20·8	1 82	2 99	.....	.....	.....
Heatherton	4	.....	251·5	.....	0 52	16	27·8	19·3	1 15	2 85	.....	.....	.....
Knoydart	8	380·0	307·1	0 13	0 27	8	23·1	25·9	1 76	2 01	1	24·2	.....
Salt Springs	8	261·3	297·5	0 25	0 26	8	23·4	23·8	1 79	2 51	2	.....	24·6
Middle Musquodoboit	3	210·0	246·0	0 19	0 21	5	24·8	29·7	1 65	1 91	2	.....	24·7
Newport	2	.....	403·8	.....	0 27	13	28·8	21·6	1 60	2 58	2	20·8	23·8
Lilydale	3	193·0	228·3	0 31	0 30	5	16·3	28·0	2 62	2 64	3	.....	26·2
Springfield	9	75·0	259·8	0 68	0 27	7	37·3	24·3	1 13	2 53	.....	.....	.....
Meteghan Centre	4	347·0	310·0	0 15	0 27	4	31·0	24·2	1 60	2 26	3	24·1	21·8
Chegoggin	5	190·0	272·3	0 34	0 32	4	17·5	25·0	3 44	2 61	2	.....	23·6
Averages	.....	251·0	286·5	0 27	0 27	.....	26·2	22·7	1 80	3 11	.....	23·0	24·6

COST OF GROWING CROPS IN NOVA SCOTIA

IN NOVA SCOTIA

Oats							Clover hay					Timothy hay				
Cost per ton		Number of years	Yield per acre		Cost per bushel		Number of years	Yield per acre		Cost per ton		Number of years	Yield per acre		Cost per ton	
1937	Average		1937	Average	1937	Average		1937	Average	1937	Average		1937	Average	1937	Average
$ cts.	$ cts.		bush.	bush.	$ cts.	$ cts.		tons	tons	$ cts.	$ cts.		tons	tons	$ cts.	$ cts.
.....	.....	16	44·0	44·5	0 43	0 83	16	2·49	2·56	5 87	6 61	16	2·55	2·47	4 61	8 15
.....	.....	16	35·0	37·3	0 47	0 70	15	2·79	2·29	5 70	8 02	14	2·38	1·92	5 98	7 72
.....	2 05	(Barley:	23·0	29·0	0 90	0 69)	16	3·00	3·38	4 52	6 29	15	2·25	2·87	5 85	5 09
.....	.....	12	43·2	42·6	0 59	0 58	12	2·83	2·07	5 37	6 99	11	2·71	2·01	5 52	7 40
.....	.....	5	37·0	55·3	0 62	0 48	15	2·11	1·78	8 67	8 14	15	2·34	1·86	5 24	7 82
1 95	.....	8	36·0	46·4	0 46	0 43	7	1·95	2·14	5 97	7 58	8	2·15	1·81	6 94	6 35
.....	1 73	(Barley:	27·0	.....	0 99	.....)	6	4·35	2·68	4 35	6 30	5	3·70	2·40	3 44	6 50
.....	2·55	11	Failed	60·9	.....	0 63	11	2·50	2·36	4 06	6 55	10	3·04	1·88	3 91	7 28
2 21	2 06	14	46·4	57·1	0 40	0 50	13	2·32	2·51	6 66	7 06	15	1·91	2·13	6 46	4 86
.....	2 23	4	Failed	53·7	.....	0 44	3	3·11	3·11	5 11	5 37	1	2·17	.....	5 91	.....
.....	.....	9	45·0	52·3	0 46	0 49	7	1·79	2·46	10 44	5 48	9	2·48	2·26	5 13	6 77
1 75	3 32	4	29·0	37·3	0 70	0 53	2	2·03	2·08	6 82	6 99	1	2·17	.....	5 21	.....
.....	3 52	5	35·0	51·1	0 80	0 55	3	3·00	2·81	7 60	6 41	3	3·25	2·67	6 15	6 04
1 97	2 50	.....	39·0	48·34	0 55	0 59	.....	2·64	2·46	6 24	6 95	.....	2·55	2·19	5 41	6 79

The cost of growing field crops during the past four years has not changed materially. This may be credited to several factors, chiefly greater knowledge as to the soil requirements at each station. Different stations present different problems. Two problems of greatest concern are: ground limestone, and economical uses of commercial fertilizers, particularly superphosphate, in conjunction with light applications of manure. This combination has increased yields and lowered the cost of production at all stations. Seasonal conditions which are difficult to control, such as too little or too much rainfall preventing early seeding or making harvesting difficult, raise the cost of labour in the production of crops.

The 1937 yields, excepting potatoes and oats, were higher than during the years from 1934 to 1936 inclusive. The average yields and costs on the station farms per ton or bushel from 1934 to 1936 inclusive were: potatoes, 294·9 bushels at $0.24; turnips, 27·5 tons at $2.04; mangels, 25 tons at $3.14; oats, 48·7 bushels at $0.46; clover, 2·27 tons at $7.19; and timothy, 2·13 tons at $6.63.

The 1937 average yields and costs per ton or bushel were: potatoes, 251 bushels at $0.27; turnips, 26·2 tons at $1.80; mangels, 23·0 tons at $1.97; oats, 39·0 bushels at $0.55; clover hay, 2·64 tons at $6.24; and timothy hay, 2·55 tons at $5.41.

When the costs of 1937 yields are compared with those over a longer period, it may be seen that potatoes giving even a lower yield were produced at the same cost per bushel, and oats yielding 9·3 bushels less per acre were produced for $0.04 less per bushel. The turnip crop averaged 3·5 tons more and cost $1·31 less per ton; mangels yielded 1·6 tons less but cost $0·53 less per ton; clover hay yielded 0·18 tons more but cost $0·71 less per ton; and timothy hay yielded 0·36 tons more but cost $1.38 less less per ton than the average since the stations started their operations.

PROGRESS REPORT ON ILLUSTRATION STATIONS IN NEW BRUNSWICK 1934 TO 1937

R. C. Parent, M.S.A., Supervisor

In New Brunswick there are at the present time 20 illustration stations. These stations are located in widely scattered parts of the province and cover a large range of soil types. They serve the farmers in the older, settled areas in the southern parts of the province where mixed farming is mainly practised, those in the upper St. John valley where potato growing is common, as well as farmers in the newer settled areas of St. Quentin and St. Isidore. The most recent departure was the establishment of a cranberry illustration station at Bay du Vin, where the possibilities of the cranberry industry will be investigated.

The full list of stations and names of operators is as follows:—

Station	County	Operator
Baker Brook	Madawaska	Felix Daigle
Bay du Vin	Northumberland	Goymer Williston
Black River Bridge	Northumberland	Walter Cameron
Buctouche	Kent	Aquila Berthe
Currieburg	York	Howard Sandwith
Grand Falls	Madawaska	Mrs. Marie Anne Morin
Harvey Station	York	Melvin Grieve
Jacquet River	Restigouche	Alex Turvey
Lower Derby	Northumberland	W. R. Taylor
Petersville	Queens	James Butler
Pomeroy Ridge	Charlotte	Burton Linton
Riordon	Gloucester	T. W. Riordon
St. Charles	Kent	Antoine Daigle
St. Isidore	Gloucester	Peter Robichaud
St. Quentin	Restigouche	Joseph Saucier
Salisbury	Westmorland	Truman Lewis
Siegas	Madawaska	Romeo Ruest
Sussex	Kings	Matthew Robinson
Tracy	Sunbury	J. H. Phillips
West Bathurst	Gloucester	W. D. G. Doucet

All lines of work conducted on the illustration stations are discussed with the owner of the farm, or the operator as he is called, before being put into operation. The operator is responsible for the greater part of the work in the actual carrying out of the various projects, and were it not for his approval and aid, the value of the stations would be greatly reduced.

Active Projects Under Study

The work of the Division of Illustration Stations covers all the important branches of farm operations, including live stock improvement, poultry improvement, experimental work with chemical fertilizers, cost-of-production studies, cultural practices, etc. There are some 30 active projects now under study in this province. The more important of these are designated as follows:—

I- 7—Crop rotation studies.
I- 9—Growing alfalfa for hay.
I-19—Introducing fodder corn into suitable districts where not grown.
I-22—The influence of lime on crop growth.
I-31—Cost of producing farm crops.
I-39—Eradication of farm weeds.
I-67—Growing potatoes under different fertilizer treatments.
I-71—Nitrogenous fertilizers for hay lands.

I–74—Barnyard manure alone and when supplemented with chemical fertilizer for root crops.
I–81—Stimulating interest in the development of the farm garden.
I–83—Pasture demonstrations with chemical fertilizers, using live stock to determine comparative grazing days.
I–86—Poultry improvement.
I–89—Study of club-root resistance in turnip varieties and strains.
I–99—Brown-heart studies in turnips.

In order to secure data on the above projects, all of the operators in the province co-operate by keeping the following records:—

(*a*) Daily milk records.
(*b*) Poultry production records.
(*c*) Yields of crops on the rotation fields.
(*d*) Labour charges against the various crops.
(*e*) Results of fertilizer experiments.
(*f*) Results of varietal tests, cultural methods, etc.

The above data have been collected for a period of 15 years and are given as averages in tabular form in this report.

Precipitation and the Growth of Crops

Yields of crops in 1935 were below average owing to unfavourable weather conditions. The summer of 1934 was very dry, which retarded the growth of the young clover plants. Later, a moist and open fall induced a rapid growth for a period. A heavy growth of immature clover therefore entered the winter, and this condition was probably partly to blame for the extensive winter killings of 1935. Dry weather in July further reduced the yield materially.

Rains were numerous during the fall months of 1935, and ample rain, well distributed, fell during the growing season of 1936. This was largely responsible for the production of very heavy crops of clover, oats, timothy hay, turnips and mangels in 1936.

The spring of 1937 was extremely wet and unfavourable for the seeding and planting of most farm crops in many areas of the province. Consequently, seeding dates were very late, being as follows: Oats, June 3; mangels, May 28; barley, June 3; potatoes, June 1; and turnips, May 27.

Special Features of Individual Stations

BAKER BROOK, MADAWASKA COUNTY

Felix Daigle, Operator

The station at Baker Brook is one of the oldest in the province. This station is noted for the very splendid crops of clover and alfalfa which have been produced during recent years. In addition to this, the operator has produced ordinarily a fair quantity of timothy seed and clover seed each year. The farm has recently been organized under two rotations, the root crop rotation consisting of five fields near the farm buildings, and a grain, hay, and pasture rotation situated on the hilly and irregular fields on the back half of the farm.

During recent years, the operator at Baker Brook has been very successful in working with poultry. A new poultry house was built in the fall of 1937, and during the month of November 2,788 eggs were produced from a flock of 205 hens, while in December 2,816 eggs were produced from a flock of 202 hens. This is a production of 45·32 per cent and 44·85 per cent respectively. Total sales of poultry and poultry products during the past year amounted to more than $750.

Mr. Daigle was one of the leading exhibitors at the newly established exhibition at Edmundston and won the following prizes:—

Two 1st's, one 2nd, and one 3rd on horses.
Three 1st's, one 2nd, and two 3rd's on Holstein cattle.
Two 1st's and one 2nd on Yorkshire swine.
One 1st, one 2nd, and one 3rd on Shropshire sheep.
Five 1st's, three 2nd's, and three 3rd's on field crops.

BAY DU VIN, NORTHUMBERLAND COUNTY

Goymer Williston, Operator

A new cranberry illustration station was established at Bay du Vin, in the fall of 1936. In parts of Northumberland and Kent counties the possibilities for increasing the production of cranberries seem to be unlimited. In the establishment of this station, a bog was selected, and one acre cleaned of small bushes. It was ploughed late in the fall and divided into three sections. On the first section sand was spread at a uniform depth of three inches. No sand was put on the second plot, and two inches of sand put on the third. For this project, some 165 team-loads of sand were required. On May 19, shortly after the water had drained away, planting of the vines was commenced. The summer of 1937 was very dry and the young plants made only fairly satisfactory growth. It will be three or four years before a sufficient stand of vines is secured for any crop. This project is being watched with considerable interest.

BLACK RIVER BRIDGE, NORTHUMBERLAND COUNTY

Walter Cameron, Operator

The farm at Black River Bridge has been rearranged under two rotations. The old station area is remaining in a four-year rotation of roots, grain, clover, and timothy, while the balance of the farm is being arranged into a new six-year rotation of grain, hay, and pasture. The heavy soil on this farm presents a real problem in the growing of root crops, consequently the better-drained areas and fields with lighter soil have been set aside for root crop production.

The season of 1937 was most unfavourable for the production of all crops at this station, and many were considered complete failures.

Mr. Cameron, the operator, keeps poultry, cattle, and horses of above-average quality, and has been a frequent winner with his stock at the Chatham Exhibition.

BUCTOUCHE, KENT COUNTY

Aquila Berthe, Operator

The farm at Buctouche is one of the smaller of the illustration stations, and the majority of the fields are farmed under a four-year rotation of roots, grain, clover, and timothy hay. In addition to this, an area has been set aside for a permanent pasture, also a small area for the growing of potatoes. In the past, many of the fields on this farm received heavy applications of mussel mud, consequently, these areas cannot be used now for the production of potatoes as scab would be prevalent.

The station is noted for the neat appearance of the farm buildings and the above-average crops, always free of weeds. Alfalfa shows promise of becoming an important crop in the territory surrounding the Buctouche station.

CURRIEBURG, YORK COUNTY

Howard Sandwith, Operator

The illustration station at Currieburg was established in the fall of 1935, and is already developing into one of the most interesting and valuable stations in the province. The farm has been arranged into a five-year rotation of roots, grain, clover, timothy, and timothy. The average area of the fields in the rotation is seven acres. In addition to this, seven acres have been set aside and fertilized for permanent pasture. All crops on the station are above the average and are planted and handled expertly. The herd of grade and pure-bred Jerseys is rapidly being changed into a herd of pure-bred cattle entirely. This herd, in the fall of 1937, was entered in the R.O.P. The Field Day held at this station on August 31 was attended by 110 people, and from all angles was considered an outstanding event for the district.

GRAND FALLS, MADAWASKA COUNTY

Mrs. Marie Anne Morin, Operator

The farm at Grand Falls has been arranged under a five-year rotation of root crop, grain, clover, and two years hay. Each field is approximately 15 acres in size, and the greater part of the root crop field is taken up with the growing of potatoes, which are a specialty on this particular station. In addition to this, 12 acres have been set aside for permanent pasture. Part of this area has been fertilized, while the other remains as a check plot. The results of this experiment may be found in another part of this report. The operator is gradually improving the herd of dairy cattle and expects before many years to have a pure-bred herd of Ayrshires. The barn and stable accommodation is ample for a much larger herd. Special improvements to the buildings this year included the painting of the dairy barn and remodelling of the poultry house.

In the vicinity of Grand Falls, wild mustard is rather prevalent, consequently, on the illustration station special attention has been given to the control of this troublesome weed. By preventing any of the plants from going to seed in the potato and root crops, a decided step is made towards its control.

The sale of potatoes represents the chief source of revenue from this farm, consequently, special experimental work with commercial fertilizers for this crop is being planned for 1938.

HARVEY STATION, YORK COUNTY

Melvin Grieve, Operator

The station at Harvey is one of the older ones and is particularly suited to the production of grain and hay crops. The soil is fairly heavy so the production of potatoes is naturally limited. During recent years, the operator has been gradually improving his herd and changing from grade Ayrshire and Holstein cattle to grade and pure-bred Jerseys, to conform with others in the district, Harvey being noted for the production of high-quality Jersey cattle. Mr. Grieve is a strong believer in the production of hogs and during 1937 the sale of hogs accounted for over $400 of the farm revenue.

JACQUET RIVER, RESTIGOUCHE COUNTY

Alex Turvey, Operator

The farm at Jacquet River has been arranged under two rotations: a root crop rotation, which comprises all except three fields on the farm; and a grain, hay, and pasture rotation for three fields of the farm which are low-lying and poorly drained. Crops at Jacquet River in 1937 were considerably above average.

The station at Jacquet River was particularly noted this year for the very neat appearance of the fields, farm buildings, and home surroundings. Immediate improvements will include the building of a new brooder house.

LOWER DERBY, NORTHUMBERLAND COUNTY

W. R. Taylor, Operator

The station at Lower Derby has been in operation for 17 years and was one of the first to be established in the province. Progress has been made in the general improvement of this farm, it is noted for the very splendid crops that are grown annually. This year, when weather conditions were unfavourable for the growing of most crops, Mr. Taylor had one of the outstanding crops of mangels and potatoes in the province, the average production of mangels being 26 tons and of potatoes, well over 300 bushels per acre.

The farm has been arranged into two distinct rotations. The old station area, comprising 24 acres of land, has been arranged into a four-year rotation known as the mangel rotation. The soil on this area is a sandy loam and dries out fairly early in the spring. It is thus possible to get mangels in comparatively early. Six fields, averaging about seven acres in area each, are arranged into a six-year rotation of grain, grain seeded, clover, timothy, timothy or pasture, and pasture. As occasion demands, a portion of the grain area is used for the production of extra potatoes. In addition to this, an area comprising six acres has been set aside for a permanent pasture. One-half of this field has been fertilized and careful records have been obtained over a period of four years. The results of this experiment may be found in another part of the report. From the buildings to the back of the farm there is a wide lane which gives access to all fields and pastures. A brook which supplies water for the cattle runs through the corners of four of the fields, including the permanent pasture.

The barns at Derby station are very badly out of date. However, Mr. Taylor has been making preparations for the building of a new dairy and horse barn in the summer of 1938. This will be a modern barn, probably 36 feet by 90 feet in size.

PETERSVILLE, QUEENS COUNTY

James Butler, Operator

Weather conditions were unfavourable for the production of heavy crops of turnips and mangels at this station this year but the crops of Victory oats and clover were satisfactory. The young clover in the experiment comparing three tons, two tons, and one ton of lime per acre, presents a heavy and uniform stand. There is a slight difference in the yield of clover on the three plots and a decided improvement over the check plots. The results of this experiment on the mature clover in 1938 are awaited with interest.

Perhaps the most striking experiment at the station at Petersville was one dealing with the effect of commercial fertilizer on permanent pasture; 150 pounds sulphate of ammonia, 280 pounds superphosphate (20 per cent), and 100 pounds muriate of potash being sown on an old pasture sod on May 12. In this field there was a large amount of moss. When the fertilized and unfertilized plots were examined in August, it was noted that in the unfertilized plots there was 12 per cent of moss, while in the fertilized plot only 1 per cent. On the other hand, in the unfertilized there was but 2 per cent of the ground covered with white Dutch clover, while in the fertilized plot 30 per cent of the ground was covered. The improvement in the sod was readily noticeable to a casual observer. A full account of this experiment is given in another part of this report.

POMEROY RIDGE, CHARLOTTE COUNTY

Burton Linton, Operator

All crops at Pomeroy Ridge, with the exception of clover hay, were average. The field of fodder corn was one of the few grown on the illustration stations in 1937 and a spendid yield of 16·56 tons was obtained. Three varieties of turnips, Perfecta, Hall's Westbury, and Wilhelmsburger, were compared and very little difference noted in the yield. The Wilhelmsburger is one of the newer varieties of turnips, grown where club-root is a problem. In experiments to date, it has shown itself to be remarkably resistant to this disease under most conditions.

All of the tillable portions of the farm at Pomeroy Ridge have been arranged into a five-year rotation of root crops, grain, clover, timothy, and grain. There is plenty of rough pasture available on this farm to meet the needs of the present herd. Fodder corn, oats and peas are of course grown to supplement the pastures during the dry period.

The operator at Pomeroy Ridge made considerable improvement to his house and barns by repair jobs and painting. This, together with the fine display of flowers and the large pine trees, makes the layout at this station very attractive.

RIORDON, GLOUCESTER COUNTY

T. W. Riordon, Operator

Operations on the station at Riordon were very successful in 1937. As usual, the outstanding crop was registered Victory oats, about 3,000 bushels being grown. Mr. Riordon will be selling a large quantity of this for seeding purposes.

The Field Day on Thursday, August 26, was one of the outstanding ones for the year with 140 people present. Interesting field experiments as well as a live stock demonstration proved to be important features of the day.

Mr. Riordon was one of the chief exhibitors at the Bathurst Exhibition, and the following prizes were won by him:—

Nine 1st's, four 2nd's, and one 3rd for horses.
Seven 1st's, six 2nd's, and one 3rd for grain.
Two 1st's, and two 2nd's for vegetables.

ST. CHARLES, KENT COUNTY

Antoine Daigle, Operator

The extremely dry summer of 1937 prevented the production of heavy crops at St. Charles. However, yields were considered satisfactory and the quality of the crops excellent. At the Field Day on August 18, a large number of people were present, and the program included an examiantion of the root crop experiment, comparing manure vs. commercial fertilizers for turnips and mangels; pasture fertilizer experiment; the effect of limestone on clover production, etc. In addition to this, an interesting live stock demonstration was put on by the District Representative and a special display of insects, both useful and destructive, was exhibited by Mr. R. P. Gorham, Entomologist, Fredericton.

The poultry flock of Barred Rocks is an excellent one and well cared for. Poultry and poultry products were the largest source of revenue at this station for the year. As a sideline Mr. Daigle has a small plot of cranberries. This year he obtained 15 bushels from one-quarter acre.

ST. ISIDORE, GLOUCESTER COUNTY

Peter Robichaud, Operator

The very dry summer of 1937 made the production of heavy crops at St. Isidore impossible. Victory oats grown on last year's root crop land were satisfactory, but mangels and corn were almost a complete failure. The operator

grew one acre of oats for pasture purposes, and this was found a very valuable aid in supplementing the dry pastures.

The farm at St. Isidore has been conveniently arranged into five fields averaging eight acres each, and a rotation of root crops, grain, clover, timothy and pastures has been decided upon. In addition to this, a small field, about three acres in area, has been set aside for a permanent pasture. This field joins the barnyard and is being fertilized in 1938. A central lane runs from the barnyard to the back fields.

In the fall of 1937, Mr. Robichaud built a new hog house and plans to go in for hog raising much more extensively than in the past.

ST. QUENTIN, RESTIGOUCHE COUNTY

Joseph Saucier, Operator

This was the first year for obtaining records at the new station at St. Quentin. The year was an outstanding one. All crops grown gave satisfactory yields. This was particularly true in connection with grain and potato production.

In order to determine the most suitable varieties of oats and barley to grow in this comparatively new territory, simple tests were conducted in 1937. Victory, Banner, Cartier, and Alaska oats, and Charlottetown No. 80 and O.A.C. 21 barley were grown in $\frac{1}{3}$-acre plots. Results showed that Victory surpassed Banner for a late variety of oats and that Cartier surpassed Alaska for an early variety. Charlottetown No. 80 was preferred to the O.A.C. 21 barley in this district. A plot of potatoes was grown by the tuber unit method.

In connection with poultry improvement, Mr. Saucier built an up-to-date brooder house 10 feet by 12 feet in size and purchased a supply of pullets from the experimental station at Fredericton, also from Mr. McGibbon, R. O. P. poultry breeder at Moore's Mills, and from Mr. McKay, an illustration station operator in Prince Edward Island.

The Field Day on August 20 was the largest one held on the illustration stations during the year. The garden at the St. Quentin station was an excellent one and consisted of vegetables as well as flowers. It proved a very attractive place for the visitors on Field Day.

SALISBURY, WESTMORLAND COUNTY

Trueman Lewis, Operator

A twelve-acre field of Victory oats, sown on May 8, gave an average yield of 47 bushels per acre, and with the exception of timothy hay, was the only satisfactory crop grown this year. The wet spring made it difficult to get the mangels, turnips, and potatoes in early on the heavy soil at this station, consequently, the yield of these crops was greatly reduced.

Farm operation, in the main, centered around the splendid herd of 15 pure-bred and grade Jersey cows kept at the Salisbury station. More than two-thirds of the total farm revenue for the year was derived from the sale of milk from this herd.

SIEGAS, MADAWASKA COUNTY

Romeo Ruest, Operator

The year 1937 was a splendid one for the production of grain, and clover crops at Siegas station. Mr. Ruest has been successful in growing heavy crops of red clover, and each year is able to thresh considerable red clover seed. Alfalfa also shows promise of becoming an important crop in this territory.

In live stock, Mr. Ruest has a very fine herd of grade and pure-bred Ayrshire cattle, also Shropshire sheep, and Yorkshire swine. At the Edmundston Exhibition, Mr. Ruest took the majority of top prizes with his Shropshire sheep.

SUSSEX, KINGS COUNTY

Matthew Robinson, Operator

The station at Sussex in 1937 was noted for the spendid yields of all crops, particularly Victory oats, Charlottetown No. 80 barley, mangels, turnips, and corn.

Like a good many farmers in the vicinity of Sussex, Mr. Robinson grew an area of cucumbers for pickling purposes. From one acre the sales amounted to $90. This was considered a very satisfactory sideline.

TRACY, SUNBURY COUNTY

J. H. Phillips, Operator

Splendid crops of clover, timothy, Victory oats, and Charlottetown No. 80 barley were grown on the station at Tracy in 1937.

The entire farm, with the exception of a small area for a permanent fertilized pasture, and a small rough pasture, has been arranged into a five-year rotation of root crops, grain, clover, timothy and timothy. Each field will be approximately 12 acres in size. In the root crop area, three acres are usually devoted to potatoes, one acre to mangels, and one acre to turnips as well as an acre in green feed. The balance of this field is used for the production of oats or barley.

FIELD DAYS

An illustration station Field Day provides for the gathering of neighbours at their nearest station on an appointed day. In 1937, Field Days were held daily, commencing August 16 at Sussex and ending August 31 at Currieburg. In all, twelve Field Days were held at the following stations:—

Sussex, at the farm of Matthew Robinson on August 16.
Buctouche, at the farm of Aquila Berthe on August 17.
St. Charles, at the farm of Joseph Daigle on August 18.
St. Isidore, at the farm of Peter Robichaud on August 19.
St. Quentin, at the farm of Joseph Saucier on August 20.
Baker Brook, at the farm of Felix Daigle on August 23.
Grand Falls, at the farm of Laurent Morin on August 24.
Jacquet River, at the farm of Alex. Turvey on August 25.
Riordon, at the farm of T. W. Riordon on August 26.
Derby, at the farm of W. R. Taylor on August 27.
Petersville, at the farm of James Butler on August 30.
Currieburg, at the farm of Howard Sandwith on August 31.

The program at all Field Days started at 2.00 p.m. and ended between 5.00 and 6.00 p.m. This year a large tent with seats and exhibits was provided and proved very useful on hot days and on wet days. Each Field Day commenced at the tent with introductory remarks on the work of the Experimental Farms System and Division of Illustration Stations. This was followed by a survey of the entire farm and special experiments. The chief experiment at each station was one comparing the four following treatments on hoed crops:—

Plot 1. Manure 16 tons per acre.
Plot 2. Manure 8 tons plus 500 pounds 20 per cent superphosphate per acre.
Plot 3. 1,500 pounds 4-8-10 fertilizer mixture per acre, no manure.
Plot 4. Manure 8 tons plus 750 pounds 2-12-6 fertilizer per acre.

The effect of the above four treatments was noted on potatoes, turnips, corn, mangels, and green feed. The experiment is to be of a permanent nature and yields will be taken of the crops which follow. At each station an interesting pasture fertilizer experiment was also seen.

The attendance at these Field Days was very satisfactory, and ranged from 50 to 250 persons. In all, approximately 2,000 people attended. Assisting the Supervisor at the various illustration stations were the superintendent and officials of the experimental station at Fredericton, members of the Federal Entomological and Live Stock Departments, as well as various members of the Extension Services of the New Brunswick Department of Agriculture. The splendid exhibit of beneficial and harmful insects, prepared and arranged by Mr. R. P. Gorham, Entomologist, and Miss Burnham, Assistant Entomologist, proved to be a very decided attraction at the Field Days.

The Farm Garden

The stimulating of interest in the development of farm gardens is an active project of the division. In a number of instances, the garden vegetables are grown along with the main root crop. At Baker Brook, St. Quentin, Jacquet River, Riordon, Lower Derby, St. Charles, and Buctouche, definite areas have been set aside for this work and splendid and useful gardens are grown annually.

The following varieties were tested at each station and found well suited to soil and climatic conditions existing in the respective localities:—

Beets—Improved Detroit
Beans—Pencil Pod Black Wax
Peas—Thomas Laxton and Stratagem
Corn—Golden Bantam and Early Banting
Carrots—Chantenay
Onions—Extra Early Flat Red
Cabbages—Danish Ball Head
Spinach—King of Denmark
Lettuce—Grand Rapids
Cucumbers—Davis' Perfect
Radish—Scarlet Turnip W. Tip
Tomatoes—Earliana
Parsnip—Hollow Crown
Pumpkin—Small Sugar
Squash—Green Hubbard
Cauliflower—Snowball

As new varieties are produced and show promise when tested at the experimental farms, they will be given further trials on the illustration stations in the province.

Choice of Varieties of Field Crops—Sale of Seed

The illustration stations in this province are doing a worth-while work in standardizing varieties and in distributing seed of high quality to farmers in the vicinity of the stations. The following are the varieties which have been found well adapted to the soil of the province, and which are used almost exclusively on the stations:—

Potatoes—Green Mountain and Irish Cobbler.
Turnips—Hall's Westbury, Ditmars, and Wilhelmsburgher (club-root resistant)
Barley—Charlottetown No. 80 and O.A.C. 21.

Oats—Victory and Banner
Fodder corn—Longfellow
Mangels—Yellow Intermediate and Giant White Sugar Mangel

During 1937 the following amounts of seed were sold by 14 operators of illustration stations in New Brunswick:—

Wheat—100 bushels
Barley—30 bushels
Oats—3,712 bushels
Timothy—1,588 pounds
Seed Potatoes—494 bushels

In all, 125 farmers, as well as a number of Agricultural Societies, obtained seed supplies from the stations.

At the experimental station, Fredericton, many varieties of wheat, oats, and barley are being tested in "rod rows" and "multiplication plots." Some of these varieties show promise of being resistant to leaf and stem rust, which are common in certain sections of the province, while others show promise of being heavier producers. It is possible that before long some of these new varieties may replace those listed above.

Supplementary Uses of Chemical Fertilizers

In New Brunswick there are approximately one million acres devoted annually to production of field crops and pastures. In 1930 the 34,000 farmers in this province used approximately $1,300,000 worth of commercial fertilizer. This means about $40 for every farmer in the province. The year 1930 was the peak year, but the quantity used within recent years still remains high.

The problem of maintaining and increasing soil fertility is considered the major agricultural problem of the province. For this reason, various methods for maintaining and increasing the fertility of the soil have been studied since the stations were first organized in 1920. This report gives the results of nine distinct experiments conducted.

1. *Barnyard manure alone, and when supplemented with chemical fertilizers for the potato crop.*—Potatoes are the most important cash crop grown in New Brunswick. On the majority of farms, only a small area is devoted to the production of potatoes and these are generally grown with manure and commercial fertilizers supplying the necessary fertility. On many larger farms in the upper St. John valley, however, it is almost impossible to find barnyard manure for all of the area normally under potatoes. It is in these areas that commercial fertilizer is used extensively.

In order to determine the effect of manure and various combinations of manure and fertilizers on the growth of potatoes, an experiment was laid down on 13 illustration stations in 1937. The experiment included the following four treatments:—

Plot 1.—Manure 16 tons per acre.
Plot 2.—Manure 8 tons per acre plus 500 pounds 20 per cent superphosphate.
Plot 3.—1,500 pounds of 4-8-10 fertilizer mixture—no manure.
Plot 4.—Manure 8 tons plus 750 pounds 2-12-6 fertilizer mixture.

At harvesting time the potatoes were divided into large and small and yields were taken of both sizes. The table which follows gives the results of the experiment in detail.

63512—54

Station	Yield in bushels per acre											
	Plot 1			Plot 2			Plot 3			Plot 4		
	Manure—16 tons per acre			Manure—8 tons per acre superphosphate 20%–500 lb.			1,500 lb. 4–8–10 fertilizer mixture per acre			Manure—8 tons per acre 750 lb. 2–12–6 fertilizer mixture		
	Marketable	Small	Total	Marketable	Small	Total	Marketable	Small	Total	Marketable	Small	Total
Baker Brook	146·8	29·4	176·2	205·5	18·3	223·8	227·5	33·0	260·5	249·6	44·0	293·6
Buctouche	180·4	35·2	215·6	171·6	44·0	215·6	202·4	30·8	233·2	176·0	30·8	206·8
Currieburg	196·0	40·0	236·0	200·0	28·0	228·0	260·0	36·0	296·0	248·0	36·0	284·0
Harvey Station	88·0	16·0	104·0	108·0	20·0	128·0	120·0	24·0	144·0	136·0	24·0	160·0
Jacquet River	138·4	36·6	175·0	284·9	36·6	321·5	284·9	40·7	325·6	223·8	48·8	272·6
Lower Derby	238·5	29·4	267·9	260·6	29·4	290·0	282·6	29·4	312·0	304·6	29·4	334·0
Petersville	205·5	22·0	227·5	227·5	29·4	256·9	168·8	51·4	220·2	187·2	36·7	223·9
Pomeroy Ridge	201·9	55·0	256·9	179·8	80·7	260·5	227·5	33·0	260·5	205·5	33·0	238·5
Riordon	300·0	32·0	332·0	212·0	68·0	280·0	304·0	32·0	336·0	316·0	24·0	340·0
St. Isidore	52·9	89·5	142·4	81·4	61·0	142·4	126·2	77·3	203·5	44·8	65·1	109·9
Salisbury	248·7	57·4	306·1	210·4	38·3	248·7	248·7	24·1	272·8	210·4	76·5	286·9
Sussex	255·2	35·2	290·4	193·6	30·8	224·4	316·8	30·8	347·6	325·6	17·6	343·2
Tracy	121·1	49·5	170·6	187·2	27·5	214·7	220·2	22·0	242·2	187·2	27·5	214·7
Total	2,373·4	527·2	2,900·6	2,522·5	512·0	3,034·5	2,989·6	464·5	3,454·1	2,814·7	493·4	3,308·1
Average (13)	182·6	40·5	223·1	194·0	39·4	233·4	230·0	35·7	265·7	216·5	38·0	254·5

NOTE.—Value of manure and fertilizer applied: Plot 1 $24, Plot 2 $17.16, Plot 3 $20.21, and Plot 4 $21.09.

A general observation of the table indicates that the yields of potatoes are considerably below average in practically every instance. This was due to the unfavourable growing conditions for 1937. When the average results of the four treatments are compared, it is noted that the plot which received commercial fertilizer alone gave slightly higher yields. This was followed by the plot which received manure plus a medium amount of mixed fertilizer, and this by the plot which received manure plus superphosphate alone. The plot which received manure alone gave the smallest average yield.

Tht value of the four treatments cannot be fully determined, however, until records are obtained from the crops which follow in 1938, 1939, and 1940. It is planned to obtain yields of grain crops in 1938, clover yields in 1939, and timothy yields in 1940. When the records from the four years are compared, a different story may be told.

2. *Barnyard manure alone and when supplemented with chemical fertilizers for the turnip crop.*—An experiment similar to that described above for potatoes was conducted on the turnip crop and yields taken from 13 stations. The following average results were obtained:—

Plot 1—Manure alone 16 tons per acre—yield 15·65 tons per acre.
Plot 2—Manure 8 tons plus 500 pounds superphosphate (20 per cent) yield 17·26 tons per acre.
Plot 3—1,500 pounds of 4-8-10 fertilizer mixture and no manure—yield 18·36 tons per acre.
Plot 4—Manure 8 tons plus 750 pounds of 2-12-6 fertilizer mixture —yield 17·28 tons per acre.

Here again it is seen that the plots which received 1,500 pounds of fertilizer alone gave slightly higher yields than the plots which had manure alone, or manure plus a medium amount of fertilizer. The after-effects, as mentioned above, will be studied on the crops which follow.

3. *Barnyard manure alone and when supplemented with chemical fertilizers for the mangel crop.*—An experiment comparing manure and commercial fertilizers for the mangel crop was laid down in 1937. The experiment includes the same four treatments as outlined above for potatoes and turnips. The following results were obtained from 11 illustration stations:—

Plot 1—Manure 16 tons per acre—yield 13·74 tons per acre.
Plot 2—Manure 8 tons plus 500 pounds 20 per cent superphosphate—yield 13·53 tons per acre.
Plot 3—1,500 pounds of 4-8-10 fertilizer mixture, no manure—yield 14·55 tons per acre.
Plot 4—Manure 8 tons per acre plus 750 pounds of 2-12-6 fertilizer mixture—yield 14·23 tons per acre.

As with turnips and potatoes, the plot which received the heavy application of commercial fertilizer alone gave slightly increased yields of mangels.

Pasture Improvement by the Use of Chemical Fertilizers

The improvement of permanent pastures by the use of chemical fertilizers is a problem which is demanding a good deal of attention on the illustration stations at the present time. Experiments are now in operation on 14 of the stations in the province, and at five stations grazing records have been kept.

In the grazing project, a pasture field is divided into two areas. One field is left in its original condition and not fertilized. The other is given an initial application of 150 pounds sulphate of ammonia, 280 pounds superphosphate (20 per cent), and 100 pounds muriate of potash. The applications which follow

the original fertilization depend upon the prevalence of clover in the pasture sod, but in most instances have consisted of 75 pounds sulphate of ammonia, 150 pounds superphosphate (20 per cent), and 75 pounds muriate of potash, for two years. This is usually followed by the original application the fourth year.

In order to determine the value of the fertilizer in this experiment, the two fields are grazed alternately and a record kept of the number of days the herd is on each pasture, as well as the amount of milk produced. The table which follows expresses the results in three ways:—

1. *Grazing days per acre.*—A grazing day means one cow, one day.
2. *Carrying capacity per acre.*—Meaning the number of cows an acre can carry for the pasture season of 122 days.
3. *Milk production per acre.*

Soil erosion by water is a problem receiving study on the illustration stations.

PASTURE FERTILIZER EXPERIMENT—AVERAGE GRAZING RECORD, 1937

—	Fertilized pasture	Unfertilized pasture
Grazing days per acre	151·00	74·70
Carrying capacity per acre	1·24	0·61
Milk production per acre	3,316 lb.	1,513 lb.

Note.—Average results from stations at Black River Bridge, Grand Falls, Harvey, Lower Derby, and Sussex.

In addition to keeping the records of cow days, milk production, etc., on the stations, these records were supplemented by keeping records of the yields of green grass on the fertilized and unfertilized plots. In order to do this, cages, one yard square, were placed on the fertilized and unfertilized areas at 14 illustration stations this year. The grass under these cages was clipped three or more times throughout the season and weights of grass obtained. Each sample of grass was dried and the yield of dry matter obtained per acre. The results of this experiment are given in the table which follows:—

EFFECTS OF FERTILIZERS ON PASTURE YIELDS

Station	Yield in tons per acre			
	Plot 1. Fertilized Area 150 lb. sulphate of ammonia 280 lb. superphosphate (20% P_2O_5) 100 lb. muriate of potash (per acre)		Plot 2. Check are	
	Green grass	Dry matter	Green grass	Dry matter
Black River Bridge	7·41	1·18	3·63	0·85
Buctouche*	7·11	2·33	5·90	1·83
Currieburg	10·13	2·68	6·35	1·78
Grand Falls	11·30	2·02	4·65	1·20
Harvey Station	9·08	2·02	3·86	1·05
Jacquet River	8·47	0·88	1·81	0·57
Lower Derby	19·97	3·37	2·12	0·68
Petersville	4·54	1·36	2·72	0·74
Riordon	15·32	3·78	5·11	1·26
St. Quentin	5·45	1·32	1·66	0·76
Salisbury	4·84	0·86	1·81	0·34
Sussex	10·59	2·56	1·66	0·86
Tracy	9·00	2·30	4·50	1·11
West Bathurst	15·13	2·55	4·84	1·29
Total	138·34	29·21	50·62	14·32
Average (14)	9·88	2·09	3·62	1·02

* 100 lb. sulphate of ammonia, 140 lb. superphosphate (20%), and 75 lb. muriate of potash were used at this station.

It will be noted from the table appearing above that the yield of green grass on the fertilized plots averaged 9·88 tons per acre, while the yield on corresponding plots which received no commercial fertilizer was 3·62 tons per acre. The yield of dry matter from the fertilized plots was 2·09 tons per acre, while the yield of dry matter on the check plots was 1·02 tons per acre. This is a very decided increase in yield, and more than sufficient to pay for the cost of fertilizer.

In addition to obtaining yields of grass, both green and dry, and a record of cow days and milk production on the various pastures, careful notes were taken on the character of the herbage on the fertilized and unfertilized pastures at Petersville, Tracy, and Sussex. These notes were taken by Mr. Herbert Groh, Botanist, Division of Botany, Ottawa. In making his notes Mr. Groh estimated the percentage of the ground covered by the various grasses and weeds. The results from the pastures at Sussex are as follows:—

	Fertilized Per Cent	Unfertilized Per Cent
Brown Top	55	30
King Devil	1	10
Timothy	1	0
Moss	0	5
White Clover	18	2
Bare Ground	5	20
Kentucky Blue	5	0

It will be noted from the above that there was a thickening of the ground covering, an increase of brown top and white clover, along with a decrease of moss and king devil on the fertilized plots.

The following results were obtained at Tracy:—

	Fertilized Per Cent	Unfertilized Per Cent
Fall Dandelion	1	28
White Clover	20	10
King Devil	2	5
Timothy	24	3
Kentucky Blue	5	3
Red Clover	5	1
Couch Grass	5	0
Bare Ground	10	15

About 25 additional species were noted on the unfertilized and 12 others on the fertilized fields. It will be noted that white clover, timothy, red clover, and Kentucky blue grass increased with fertilizing, also various weeds were reduced.

Petersville pastures were examined on August 10 and the following results obtained:—

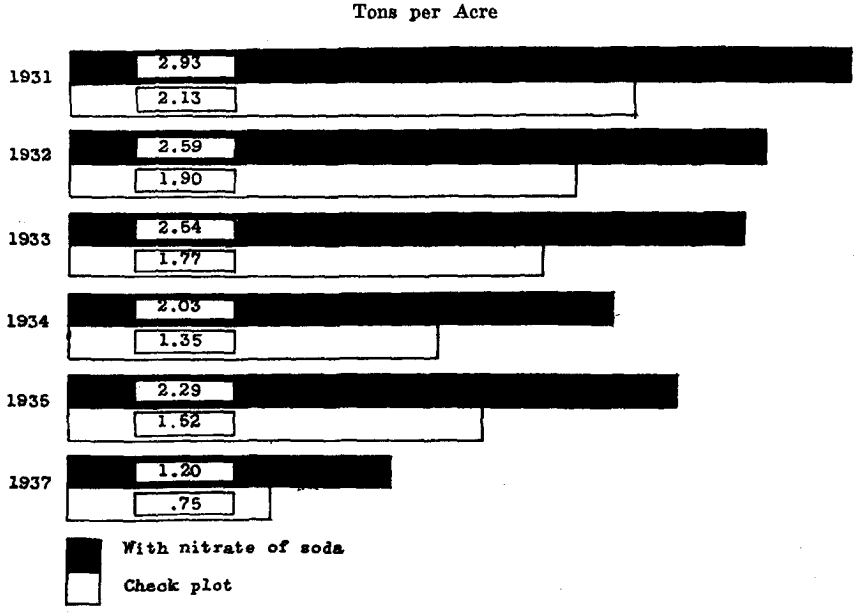
	Fertilized Per Cent	Unfertilized Per Cent
Poverty Grass	10	20
King Devil	2	18
Moss	1	12
Yarrow	5	8
Everlasting	0	8
White Clover	38	2
Brown Top	5	2
Timothy	10	2
Horsetail	8	1
Bare Ground	1	5

About 25 additional species were noted in each.

The prompt decrease in moss, with attendant increase of white clover, under close grazing and fertilization is noteworthy. In the unfertilized plots there was a large percentage of the ground covered by king devil, moss, yarrow, and everlasting. The thickening of the ground cover on the fertilized area is due largely to the increase in white clover and to some extent to timothy.

These experiments will be continued in 1938 and various experiments dealing with controlled grazing will also be tried to supplement those being carried on at the Fredericton experimental station.

EFFECT OF APPLYING 125 POUNDS NITRATE OF SODA TO TIMOTHY MEADOWS IN EARLY SPRING—AVERAGE RESULTS 1931-37



Nitrate Fertilizers for Timothy Meadows

The practice of sowing nitrogenous fertilizers alone on timothy meadows early in the spring has been followed on the illustration stations in New Brunswick as well as the stations in all the Maritime Provinces since their inception. The results to date have been very satisfactory, and the increased yields have been more than sufficient to pay for the cost of fertilizer and the labour of

sowing it. Where a field remains in timothy for a considerable number of years, it would probably be a safer plan to sow a complete fertilizer or barnyard manure. But, as is the case in the present experiment, the fields are left in timothy one or two years only.

In 1937, at 15 illustration stations 133 pounds of nitrate of soda was sown on one acre of timothy. The sowing in most cases was done as soon as the timothy made a fair start in the spring. The cost of the fertilizer was $2.54. This, together with a charge for hauling and sowing, makes a total cost against the fertilizer of approximately $3 per acre.

The average yield from the 15 stations with nitrate of soda was 1·20 tons per acre, and without it, 0·75 tons per acre. This means an increase of 0·45 tons of hay at a total cost of $3 per acre.

In addition to increasing the yield the quality and succulence of the hay is also improved. Those operators who save a portion of their fields for timothy seed purposes invariably save that area which has received nitrate fertilizers. The diagram on the preceding page illustrates the effect of nitrate of soda over a period of six years.

Effect of Commercial Borax on the Prevalence of Brown-Heart in Turnips

Brown-heart of turnips is a serious disease in New Brunswick, and one which has demanded intensive study during the past five years. In co-operation with the Central and Maritime Committees on brown-heart investigation, the Division of Illustration Stations has assisted to the fullest possible extent in the study of this problem, experiments being conducted in many parts of the province.

In 1933 trials included among other things a study of the effect of ground limestone at 2,000 pounds, common salt at 400 pounds, and borax at 10 pounds per acre. Results showed that salt and ground limestone materially increased the percentage of severe brown-heart, while an application of borax had considerable controlling effect.

The trials in 1934 dealt with the application of borax at different rates and by different methods. The results showed slightly greater control from the use of larger applications of 15 and 20 pounds per acre.

In 1935, five treatments, using manure, fertilizer, and borax were tried. The results indicate that the plots which received manure and 15 pounds of borax were practically free from severe brown-heart. The next best plot was the one that received 1,000 pounds fertilizer and 15 pounds borax, followed closely by the plots which received manure alone. The plots which received fertilizer alone were the most seriously affected.

In 1936, all tests with brown-heart on the illustration stations dealt with the effect of ground limestone on its prevalence. Turnips were examined from plots which received three tons, two tons, one ton, and no limestone, with 15 pounds borax in addition, and from similar plots with no borax. Generally speaking, plots which received heavy applications of limestone were more seriously affected by the disease. This was more noticeable on plots receiving no borax.

In 1937, borax at the rate of 15 pounds per acre was used on ten illustration stations. Check plots were reserved and records of disease content taken at harvest time. The results showed that in the plots receiving borax, only 6 per cent of the turnips were severely affected with brown-heart, while 90 per cent were free. Where no borax was used, 41 per cent of the turnips were seriously affected with brown-heart, 17 per cent slightly affected and 44 per cent free. The cost of the borax per acre was in the vicinity of 90 cents, and the increase in the value of the crop was considered to be, in all instances, much more than sufficient to pay for the cost of the borax.

Effect of Ground Limestone on the Acidity of the Soil

In 1936 an experiment comparing three tons, two tons, one ton, and no limestone was laid down on all illustration stations in New Brunswick, as well as in the other Maritime Provinces. The idea of this experiment is to compare the value or detrimental effects of limestone at the various rates mentioned on the different root crops grown, as well as on grain, clover, and timothy production. The results of the limestone are being studied throughout the continuation of the rotation. In 1937, samples were taken from all of these plots and pH readings for soil acidity taken. (A pH value of 7·07 is neutral, that for acidity is anything less, that for alkalinity is anything greater. The best growth of most plants is usually obtained in slightly acid soils—"Soil Conditions and Plant Growth"—Russell). At Buctouche it was found that all four plots in this experiment had a pH value higher than 7·00, which indicates a neutral soil. The field on which this experiment was applied received applications of mussel mud in previous years. The average of all plots which received three tons of limestone was found to be 6·49, while the average of all plots receiving no limestone was 5·88, a decidedly acid reaction.

The results of this experiment on the growth of clover and alfalfa hay will be watched with interest in 1938.

Crop Rotations and the Systematic Laying-out of Stations

One of the major pieces of work carried on by the illustration stations at the present time is that dealing with the systematic arranging of the farm into a rotation or rotations which will best meet the needs of the farmer operating the station, and which would be applicable in the main to the district surrounding the illustration station.

A crop rotation has been defined as "a regular succession of crops, so arranged that the desired amounts of the chosen crops are grown, and the soil handled in such a manner as to leave it in a better condition as regards fertility and freedom from weeds, for the crops which follow."

On the majority of farms in New Brunswick, two or more rotations are usually necessary. This is due to the fact that some of the fields are rough, irregular in shape, and possibly low-lying, making them unsuitable for the production of root crops. Usually the better-drained fields and those nearer the farm buildings are chosen for the production of root crops. Where all fields come in a root crop rotation, definite areas are ordinarily set aside for permanent pastures. In many instances, these permanent pastures are fertilized. The results of the experiment with fertilizers for pastures are dealt with at length in another part of the report.

When an illustration station is first established, the entire farm is measured and the farm arranged into one or more definite rotations. Fields where the water supply can be conveniently arranged are either laid down into a permanent pasture or arranged into a rotation including pasture. Excepting in the areas where potato growing is extensive, not more than one-half of the farm can be conveniently arranged into a root crop rotation, such as roots, grain, clover, timothy, and timothy. The remaining part of the farm more conveniently arranges itself into a rotation including grain, hay, and pasture, usually two years of each. Every effort is made to conserve and make as much barnyard manure as possible and to spread this over all of the fields on the farm. Commercial fertilizer is used to supplement the manure. One can easily understand that every farm presents problems in itself and therefore has to be studied individually. In general, however, the plan is to make larger and more regularly-shaped fields than is usually the case at present. Where possible, central lanes are arranged, so as to make access into each field easy.

In the illustration station plan much study is given to the economical use of barnyard manure and commercial fertilizers. It is thus important that the fields be carefully arranged, so that any experiments which are laid down can be of a permanent nature.

In the notes on the individual stations, mention was made of the various rotations followed.

Cost of Production Studies

The obtaining of yields of farm crops grown under different soil and weather conditions and the calculation of the cost of production per unit are important projects of the illustration stations. In the economical management of any farm, yield and cost per unit are vital factors, as they largely determine the profit or loss which is made. The operator of an illustration station keeps a strict record of all labour, manual and horse, that he expends on each crop on his station. He also uses for each crop a definite amount of seed and a stipulated amount of barnyard manure and commercial fertilizer. Yields are taken at harvest time and from the yields and the total expenses, the cost of producing a certain crop is calculated.

In the early days of station operations the cost of production data were figured from small areas, but with the present set-up the records are obtained from the larger areas on the farm, thus making them more comparable with actual conditions in the province.

Cost of production data have been collected over a period of 17 years in this province. This report gives the cost of producing the following major farm crops: potatoes, turnips, mangels, clover hay, timothy hay, barley, oats (after roots), and oats (after sod).

POTATO PRODUCTION

Despite lowered prices during recent years, potatoes still remain a very important cash crop for New Brunswick farmers. Potatoes were grown on 14 stations for cost-of-production studies in 1937. The average yield, field run, was found to be 235·4 bushels per acre, and the cost per bushel 21 cents.

An itemized statement of the yield and cost of production by stations follows.

POTATOES—YIELD AND COST OF PRODUCTION BY STATIONS

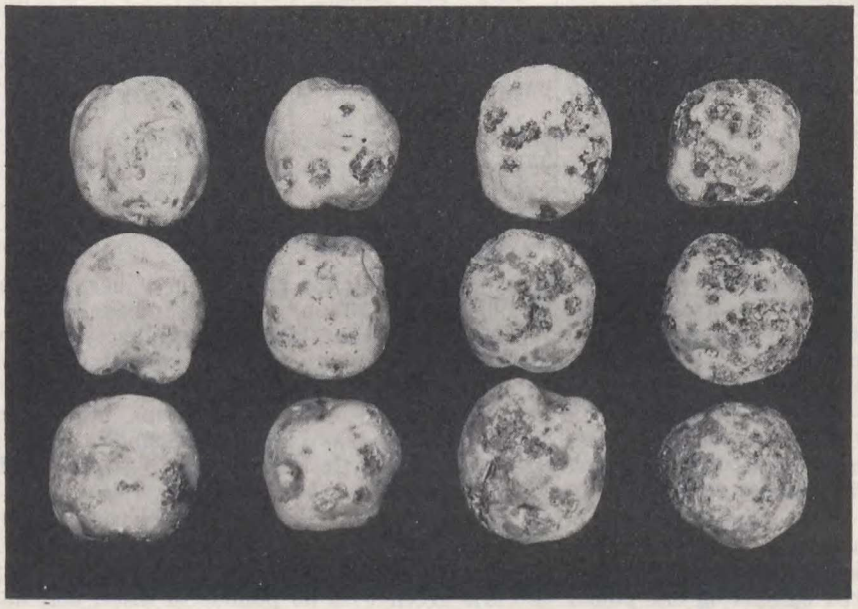
Station	1937		Itemized statement of cost per acre					Average		
	Yield per acre (bushels) (field run)	Cost per bushel	Use of land and taxes	Manure and fertilizer	Labour	Seed	Machinery	Number of years grown	Yield per acre (bushels) (field run)	Cost per bushel
		$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.			$ cts.
Baker Brook	239·0	0 20	3 23	9 91	22 26	9 00	2 85	8	280 7	0 22
Black River Bridge	.....	.....	.....	.....	.....	.....	.....	6	243·3	0 23
Buctouche	217·8	0 22	3 93	10 09	22 29	9 00	2 85	4	263·3	0 24
Curriebürg	261·0	0 17	3 00	10 21	18 33	9 00	2 85	1	261·0	0 17
Grand Falls	200·0	0 19	4 07	9 99	12 09	9 00	2 85	12	287·1	0 19
Harvey Station	134·0	0 33	3 08	9 94	18 90	9 50	2 85	6	183·7	0 32
Jacquet River	273·7	0 19	3 93	9 91	26 57	9 00	2 85	8	243·7	0 24
Lower Derby	300·9	0 18	2 92	9 94	31 44	6 75	2 85	12	274·1	0 31
Petersville	232·1	0 18	1 03	9 99	19 22	9 00	2 85	7	216·7	0 30
Pomeroy Ridge	254·1	0 17	2 11	10 16	17 82	9 00	2 85	5	246·8	0 22
Riordon	322·0	0 12	1 67	9 94	15 87	8 00	2 85	7	308·0	0 22
St. Charles	.....	.....	.....	.....	.....	.....	.....	4	206·2	0 24
St. Isidore	149·5	0 29	2 00	10 14	19 93	8 00	2 85	5	185·1	0 40
Salisbury	200·0	0 22	2 37	10 17	19 87	8 00	2 85	1	200·0	0 22
Siegas	.....	.....	.....	.....	.....	.....	.....	3	194·0	0 31
Sussex	301·4	0 25	1 87	10 20	50 94	9 00	2 85	6	268·7	0 31
Tracy	210·5	0 21	2 38	9 99	15 95	12 50	2 85	5	225·1	0 37
West Bathurst	.....	.....	.....	.....	.....	.....	.....	4	274·1	0 19
Average (14)	235·4	0 21	2 69	10 04	22 25	8 91	2 85	.....	.....	.....

An examination of the table shows that the cost per acre is made up as follows:—

Use of land and taxes	$ 2.69
Manure and fertilizer	10.04
Labour	22.25
Seed	8.91
Use of machinery	2.85

In other words, if a grower were to obtain 235 bushels per acre and receive 21 cents per bushel, field run, for them, he would be getting $22.25 for his labour and that of his team, after charges for manure, fertilizer, seed and machinery have been cared for.

To date, the division has made no attempt to keep a record of the grading, bagging, shrinkage, and hauling to market, all of which must be considered when the total cost of placing a bushel of potatoes on the market is calculated.



Effects of lime on the prevalence of common scab. Left to right illustrates the degree of infestation on plots receiving no lime, also one, two and three tons per acre respectively, at Rose Valley, P.E.I.

TURNIP PRODUCTION

Turnips are the most important succulent crop grown in New Brunswick. They are used chiefly for cattle feeding, but a small quantity is also used for table purposes. The variety Hall's Westbury has been grown for many years on the New Brunswick stations and has given good results. In addition, the varieties Ditmars and Perfecta were also grown in 1937, and yields were considered satisfactory. On stations such as Sussex and Salisbury, where club-root is a deciding factor in turnip production, the variety Wilhelmsburger (club-root resistant), has been used with excellent results.

A yield of 17·37 tons per acre, at an average cost of $3.01 per ton was obtained on 17 of the New Brunswick stations in 1937. The total cost per acre was slightly more than $50. Labour accounts for more than half of the cost of producing this crop. In the table which follows, it will be noted that yield per acre in most instances is the deciding factor in producing a crop at a reasonable price. In a few instances, however, when hand hoeing was excessive, labour was the chief factor responsible for the high cost per ton. Manure and fertilizer accounts for $10.38 of the total cost per acre.

TURNIPS—YEILD AND COST OF PRODUCTION—BY STATIONS

Station	1937		Itemized statement of cost per acre					Average		
	Yield per acre (tons)	Cost per ton	Use of land and taxes	Manure and fertilizer	Labour	Seed	Machinery	Number of years grown	Yield per acre (tons)	Cost per ton
		$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.			$ cts.
Baker Brook	21·12	2 22	3 23	11 41	28 08	1 26	2 85	11	24·19	2 57
Black River Bridge	.....	.....	.....	.....	.....	.....	.....	6	19·27	2 73
Buctouche	11·48	3 75	3 93	10 09	25 34	0 84	2 85	9	20·49	2 67
Currieburg	12·40	4 11	3 00	10 21	34 06	0 84	2 85	1	12·40	4 11
Grand Falls	21·58	1 86	4 07	9 99	21 95	1 26	2 85	13	21·50	2 01
Harvey Station	17·26	2 56	3 08	11 14	25 88	1 26	2 85	9	20·98	2 49
Jacquet River	22·98	2 86	3 93	10 91	46 66	1 35	2 85	10	16·66	3 77
Lower Derby	31·04	1 67	2 92	9 94	34 89	1 26	2 85	12	22·61	3 73
Petersville	17·10	1 87	1 03	9 99	16 78	1 26	2 85	9	15·46	3 49
Pomeroy Ridge	12·12	2 89	2 11	11 36	17 06	1 59	2 85	7	24·14	2 34
Riordon	16·55	2 98	1 67	9 94	33 62	1 26	2 85	13	16·05	4 31
St. Charles	12·04	4 15	2 08	10 09	34 08	0 84	2 85	7	13·26	3 78
St. Isidore	9·60	3 80	2 00	10 14	20 22	1 26	2 85	9	15·30	3 72
St. Quentin	9·30	7 25	2 75	9 83	50 76	1 26	2 85	1	9·30	7 25
Salisbury	12·35	3 21	2 37	10 17	22 07	2 25	2 85	6	14·76	3 96
Siegas	25·67	1 35	3 22	10 00	17 65	0 84	2 85	9	24·85	2 40
Sussex	26·76	1 79	1 87	10 20	30 65	2 25	2 85	4	18·19	3 07
Tracy	16·00	2 89	2 38	11 04	28 63	1 26	2 85	12	18·96	3 77
West Bathurst	.....	.....	.....	.....	.....	.....	.....	8	18·60	2 97
Average (17)	17·37	3 01	2 68	10 38	28 73	1 30	2 85	.....	.....	.....

MANGEL PRODUCTION

The last few years have been poor ones for the production of heavy crops of mangels. The average yield for 1935 was 11·20 tons per acre, and for 1937 it was 14·15 tons per acre. This crop, however, is retaining its popularity, and with more attention being given to swine breeding, the acreage, in all probability, will steadily increase.

The soil for mangels is prepared as for potatoes or turnips, but a special effort is made to have seeding accomplished as early as possible. From five to six pounds of seed are sown per acre, and the drills are rolled after seeding. This hastens germination.

The mangel crop is often subject to the ravages of cutworms, and any grower who expects to obtain success with this crop must be prepared to sow poisoned bait once or twice when the plants are small. Poisoned bait is prepared by mixing one pound of Paris green with 50 pounds of bran, and moistening this with four to five gallons of water, or just sufficient to make the bran mealy and easily sown. A quart of molasses may be added to the water if desired, as it is claimed that the cutworms are attracted by it.

Bran mash is sown just prior to, or immediately after, the mangles appear above ground. The sowing is done late in the evening, as the cutworms feed only at night. Twenty pounds is sufficient for one acre.

CLOVER AND TIMOTHY HAY PRODUCTION

The year 1937 was only fair for the production of heavy crops of clover hay, the average yield being 1·65 tons per acre, and the cost $9.77 per ton.

To the dairy farmer the clover crop should be one of the most important, as it is his chief protein roughage. Unfortunately, the quality of the clover is often very poor, this being due chiefly to the fact that the cutting is often delayed unnecessarily. Hay-making takes from two to four weeks. The common practice with the majority of farmers is to delay starting until all of the fields are in that state considered ideal for the making of good hay, that is when the second blossom has fallen in the case of timothy, and when one-quarter of the blossoms have blackened in the case of red clover. Hay, both clover and timothy, matures very rapidly. Thus, it is evident that before hay-making has been completed both the clover and timothy will have passed that stage where the greatest amount of protein can be secured. It is a better plan to cut a portion of the

clover and timothy hay on the green side, even though it is a little more difficult to cure it. Any plant exists primarily for the purpose of reproducing its kind. Immediately after the plant has flowered the whole mechanism of the plant is devoted to the production of seeds. In a very short time the stems and leaves of the plant become woody and lacking in food value. In cases where hay-making is unduly delayed, the seed may be ripe and much of it lost at harvest time. This is very definitely a waste. Early hay-making, therefore, should be the objective.

BARLEY PRODUCTION

Barley production has been made a special feature on the New Brunswick stations during recent years. An effort has been made to increase production in order that more will be available for hog feeding, as barley is considered the best grain for fattening and finishing purposes. Ten stations grew barley in 1937, with an average yield of 24·9 bushels per acre. A yield of approximately 45 bushels of oats would be required to supply an equal quantity of digestible nutrients.

Charlottetown No. 80 barley was grown on most of the stations, although a few used O.A.C. 21. Both are considered satisfactory varieties.

When used as a nurse crop, from two to two and one-half bushels per acre are ordinarly sown. When seeding barley alone, heavier rates than this have been found to give increased yields, and also act as a splendid smothering crop.

OAT PRODUCTION

Oats are by all odds the most important grain crop of the province and usually satisfactory yields are obtained. The year 1937 was one of the poorest in recent years for the production of this crop. The spring was wet and it was difficult in many cases to get the crop in early. The dry summer retarded growth, and in a number of cases where oats were sown late, leaf and stem rust reduced the crop very materially. The average yield of 42 bushels per acre at a cost of 55 cents per bushel was obtained on 16 stations. The various items of cost were as follows:—

Use of land, and taxes	$2.72
Manure and fertilizer	8.13
Labour	7.32
Seed	2.46
Machinery	2.85

The most common variety grown on the stations is Victory, and from three to three and one-half bushels are ordinarily seeded per acre. Care is taken to see that the seed is treated for smut prior to seeding. In most cases formalin was used, but in a few instances, the new improved Ceresan Dust was used with entire satisfaction. When formalin is used the grain must be sown soon after treating. On the other hand, when Ceresan Dust is used, it is recommended that treating be done about two weeks prior to seeding. In fact treating may be done with Ceresan any time during the winter, after the cleaning has taken place.

Every effort is being made to increase the production of oats in the province. In many instances, commercial fertilizer is used to supplement barnyard manure. The most common application is 300 pounds of 2-12-6 fertilizer per acre. Where the mixing is done at home the following mixture has given excellent results: 75 pounds sulphate of ammonia, 200 pounds superphosphate, and 50 pounds muriate of potash.

In districts where leaf and stem rust are troublesome, it is the intention of the division to test a number of the newer productions, which are claimed to have resistance to these diseases. The following table records the 1937 yield and cost of production as well as the averages for the period of years they have been grown for oats, barley, timothy, turnips and potatoes.

Station	Oats					Barley				
	Number of years	Yield per acre		Cost per bushel		Number of years	Yield per acre		Cost per bushel	
		1937	Average	1937	Average		1937	Average	1937	Average
		bushels	bushels	$ cts.	$ cts.		bushels	bushels	$ cts.	$ cts.
Baker Brook	8	50·0	38·5	0 41	0 55	.....	.....	.....	.....	.....
Black River Bridge	8	.....	46·8	.....	0 46	.....	.....	.....	.....	.....
Buctouche	9	37·7	44·2	0 55	0 47	1	23·0	23·0	1 29	1 29
Currieburg	1	61·0	61·0	0 41	0 41	1	33·0	33·0	0 58	0 58
Grand Falls	13	55·6	66·6	0 36	0 35	3	25·0	24·0	0 86	0 67
Harvey Station	9	32·9	53·2	0 58	0 44	1	18·3	18·3	1 39	1 39
Jacquet River	11	20·0	30·5	1 01	0 83	1	15·0	15·0	1 36	1 36
Lower Derby	13	40·0	60·8	0 72	0 43	.....	.....	.....	.....	.....
Petersville	8	35·0	43·1	0 56	0 43	1	25·0	25·0	0 80	0 80
Pomeroy Ridge	7	35·0	51·3	0 67	0 46	.....	.....	.....	.....	.....
Riordon	13	60·0	65·2	0 36	0 39	.....	.....	.....	.....	.....
St. Charles	3	.....	35·1	.....	0 54	.....	.....	.....	.....	.....
St. Isidore	9	25·0	32·7	0 69	0 58	1	10·0	10·0	1 32	1 32
St. Quentin	1	47·6	47·6	0 35	0 35	1	38·0	38·0	0 42	0 42
Salisbury	9	46·7	47·8	0 50	0 55	.....	.....	.....	.....	.....
Siegas	11	39·2	49·4	0 59	0 47	.....	.....	.....	.....	.....
Sussex	12	43·0	51·5	0 52	0 45	2	38·0	34·0	0 62	0 69
Tracy	14	43·0	53·8	0 56	0 44	1	24·0	24·0	1 05	1 05
Average	.....	42·0	.....	0 55	.....	.....	24·9	.....	0 97	.....

IN NEW BRUNSWICK—1937

Timothy hay					Turnips					Potatoes				
Number of years	Yield per acre		Cost per ton		Number of years	Yield per acre		Cost per ton		Number of years	Yield per acre		Cost per bushel	
	1937	Average	1937	Average		1937	Average	1937	Average		1937	Average	1937	Average
	tons	tons	$ cts.	$ cts.		tons	tons	$ cts.	$ cts.		bushels	bushels	$ cts.	$ cts.
9	1·95	2·31	6 22	6 31	11	21·12	24·18	2 22	2 57	8	239·0	280·7	0 20	0 22
4	0·51	1·07	21 12	12 26	6	.....	19·27	.....	2 73	6	.....	243·3	.....	0 33
5	1·25	1·79	11 39	7 81	9	11·48	20·49	3 75	2 67	4	217·8	263·3	0 22	0 24
1	1·06	1·06	10 24	10 24	1	12·40	12·40	4 11	4 11	1	261·0	261·0	0 17	0 17
13	1·02	1·66	11 40	8 14	13	21·58	21·50	1 86	2 01	12	200·0	287·1	0 19	0 19
8	1·53	1·82	7 27	6 91	9	17·26	20·98	2 56	2 49	6	134·0	183·7	0 33	0 32
8	1·28	1·73	11 59	8 35	10	22·98	16·66	2 86	3 77	8	273·7	243·7	0 19	0 24
14	1·90	2·07	5 75	6 68	12	31·04	22·61	1 67	3 73	12	300·9	274·1	0 18	0 31
7	0·70	1·84	12 37	6 25	9	17·10	15·46	1 87	3 49	7	232·1	216·7	0 18	0 30
3	.....	2·84	.....	4 44	7	12·12	24·14	2 89	2 34	5	254·1	246·8	0 17	0 22
11	1·50	2·05	7 37	7 16	13	16·55	16·05	2 98	4 31	7	322·0	308·0	0 12	0 22
5	.....	1·54	.....	8 92	7	12·04	13·26	4 15	3 78	4	.....	206·2	.....	0 24
8	0·85	1·36	11 99	8 87	9	9·60	15·30	3 80	3 72	5	149·5	185·1	0 29	0 40
.....	.....	.....	.....	.....	1	9·30	9·30	7 25	7 25	.....	.....	.....	.....	.....
7	1·50	1·77	7 13	6 61	6	12·85	14·76	3 21	3 96	1	200·0	200·0	0 22	0 22
8	0·96	2·29	14 91	6 68	9	25·67	24·85	1 35	2 40	3	.....	194·0	.....	0 31
9	1·60	2·26	8 26	5 56	4	26·76	18·19	1 79	3 07	6	301·4	268·7	0 25	0 31
12	1·19	2·40	8 77	5 92	12	16·00	18·96	2 89	3 77	5	210·5	225·1	0 21	0 37
.....	1·25	.....	10 39	.....	.....	17·37	.....	3 01	.....	.....	235·4	.....	0 21	.....

Live Stock Improvement

The process of building up the dairy herd on the stations and increasing the annual milk production is a slow one. The quality of the stock has been decidedly improved during recent years, but the very poor pastures and poor clover crops during 1934, 1935, and 1936 have tended to keep the production down.

In 1935 and 1937 the average production per cow on the stations was 5000 pounds milk and 215 pounds butterfat for the lactation period of 250 days. The average is held down by the several large herds with many poor individuals. These low producing individuals are being gradually weeded out.

Ayrshire and Jersey breeds predominate on the stations, and a number of pure-bred herds are being gradually developed. Two herds, namely, those owned by Truman Lewis, Salisbury, and Howard Sandwith, Currieburg, are tested under R.O.P.

General Improvements

Each operator of an illustration station gives attention to the general improvement of his farm and farm buildings. Improvement is brought about by cleaning up the road sides, planting shrubs and flowers, repairing old buildings, building new ones, and by painting and whitewashing. The whole object is to make the farm home a little more attractive and a better place in which to live.

PROGRESS REPORT ON ILLUSTRATION STATIONS IN QUEBEC 1934-1937 INCLUSIVE

There are 52 illustration stations in the province of Quebec, of which number, three were authorized in the fall of 1937, namely at St. Celestin, Nicolet county, St. Zenon, Berthier county, and Bromptonville, Richmond county. The work on these stations is developed and supervised from the experimental stations at Ste. Anne de la Pocatiere, Normandin, Lennoxville, Kapuskasing, and the Central Experimental Farm, Ottawa.

The farm improvement program being developed on each station is reviewed in geographical order under the four existing districts of supervision, namely Northwestern, Western, Central, and Eastern Quebec. The northwestern region includes the counties of Abitibi and Timiskaming, and is supervised from the experimental station, Kapuskasing, Ontario. The western district of supervision includes that region on both sides of the St. Lawrence river from the Ontario boundary to Three Rivers, associated with it also are a group of stations in Eastern Ontario directed from the Central Experimental Farm, Ottawa. The central region includes that area usually referred to as the Eastern Townships, also the Chaudiere river valley and lake St. John district. These stations have been supervised from the Central Experimental Farm throughout the period in question, but in future will be handled from the experimental station, Lennoxville. The eastern Quebec district of supervision, the work in which centres out from the experimental station, Ste. Anne de la Pocatiere, comprises the lower St. Lawrence river valley and the Gaspé peninsula.

Special projects dealing with crop introduction, soil fertility, cultural practices, farm management studies, yield and cost-of-production data, are summarized for these four Quebec districts of supervision and presented at the conclusion of the report, following the individual reviews dealing with the farm improvement program in the process of development on each of the illustration stations in this province.

Illustration Stations in Northwestern Quebec

F. X. Gosslin, B.S.A., Supervisor

There are nine illustration stations carrying on active work in the northwestern Quebec district of supervision. Six of these stations are located in the Abitibi and three in the Timiskaming district. Being located in the more recently established farming communities, the program of work is directed more particularly to drainage, crop rotations, farm organization, early maturing varieties of cereals, forage crops, and a study of the most successful cultural practices. On several of these properties the acreage under cultivation as yet is not large. Thus in developing the farm program, provision is made for the clearing of a certain acreage of land each year in order to bring under cultivation a sufficient acreage to provide the necessary revenue for operating and household expenses. In these newly organized farm parishes, six of the nine stations were established in 1936. As a result the work is but in its initial stage.

The location of the stations and the names of operators are as follows:—

Champcoeur, Abitibi district	Evariste Beliveau
Dupuy, Abitibi district	Nap. Gervais
La Motte, Abitibi district	Johnny Guay
Launay, Abitibi district	Adolphe Lord
Palmarol, Abitibi district	Joseph Nicol
Senneterre, Abitibi district	Benoit Caron
Montbeillard, Timiskaming district	Joseph Corriveau
Notre Dame du Nord, Timiskaming district	Adelard Grenier
Laverlochere, Timiskaming district	Albert Trudel

To investigate the major farming problems of this northern community, and associated with the work on the illustration stations, a district experimental sub-station was established at Makamik in the spring of 1936. Here a definite area is set aside for experimental work, studying the effects of chemical fertilizers on different crops, suitability of different cereal varieties, forage crops adaptable to the district, as well as the possibility of producing succulent crops. The results obtained on the different stations are tabulated in this report, and deal with matters of general farm organization as well as projects of a fact-finding nature.

Description and Organization of Station Farms

CHAMPCOEUR, ABITIBI DISTRICT

Operator, Evariste Beliveau

Champcoeur is situated in the newly settled farming area 20 miles north of Barraute. In this district, which comprises the townships of Castagnier, Lamorandiere, and Rochebeaucour, some 300 settlers are established, each one having from 25 to 40 acres of land already cleared.

Illustration station work was begun at this point in the fall of 1936. Ploughing, ditching, and the eventual division of the farm to conform with a six-year rotation, are the projects featured to date. The soil is low in fertility, hay being the only crop harvested for some ten or twelve years. In 1937 potatoes, oats, peas and vetch; and mixed hay were grown. Oats and barley were seeded but no yields were recorded. A yield of 180 bushels of potatoes was registered at a cost of $0.31 per bushel, 1·5 tons oats, peas and vetch hay at a unit cost of $17.51 and one-half ton mixed hay per acre at a cost of $16.76 per ton.

The live stock kept on the farm comprises six cows, two heifers, two horses, and a few hens. The produce from the dairy herd is disposed of in the vicinity.

DUPUY, ABITIBI DISTRICT

Operator, Nap. Gervais

The illustration station was established in this district in the spring of 1935. In this same year the farm was devided to conform with a six-year crop rotation. The operator is aiming to improve two fields each year, thus completing the rearrangement of the farm by the time the third year has elapsed. The introduction of alfalfa into the hay mixture at the rate of five pounds per acre has improved the quality of the hay to a marked extent.

The principal revenue on this farm is derived from cattle and poultry. Individual milk records are kept and selection work is carried out on this basis, the low producers being disposed of and the young stock reared from the best cows. Six cows are kept and the milk is sold locally. Other live stock on the farm comprises four heifers, two sows, one Yorkshire boar and 110 Barred Rock hens. During the winter months of 1936-37, the current price of eggs ranged from 40 to 45 cents per dozen, and a very satisfactory revenue was derived from the poultry enterprise.

LA MOTTE, ABITIBI DISTRICT

Operator, Johnny Guay

This station is located 20 miles south of Amos on the route to the Siscoe mine, and in the vicinity of La Motte lake. The area served is of relatively great agricultural importance in that the mining industry offers a ready market for farm produce. When work commenced at this point in 1936, 40 acres of land were under cultivation. An additional 20-acre area was cleared in 1937, in-

creasing the tillable land to 60 acres. Station work for the next few years will be confined to clearing, ditching, bringing new land under cultivation, and finally the establishment of a six-year crop rotation.

During 1937 a yield of 260 bushels of potatoes per acre was recorded at a cost of $0.33 per bushel. Oats, peas and vetch hay yielded 2·0 tons per acre at a unit cost of $16.45, clover hay 2·25 tons per acre at $6.51, and mixed hay 1·00 ton at a cost of $10.46 per ton. Cereal crops produced in this same year included Cartier oats which yielded 30 bushels per acre at a cost of $0.56; O.A.C. No. 21 barley 49 bushels per acre at a unit cost of $0.36, and Garnet wheat 40 bushels per acre at a cost of $0.59 per bushel.

The live stock on the farm consist of eight cows, all of which are on a daily record system, one pure-bred Ayrshire bull, four heifers, two horses, two sows, and 50 hens. A rather extensive gardening project is carried on each year and a profitable market for the produce is found in the adjacent mining towns.

LAUNAY, ABITIBI DISTRICT

Operator, Adolphe Lord

Station work was begun at this point in 1936. During the first year ten acres of land were cleared and ploughed. The remainder of the farm has been divided so as to allow for the establishment of a six-year rotation. It is proposed to improve one field each year.

In 1937 potatoes were planted but the crop proved a total failure. The soil is relatively infertile, sandy, and the first year results indicate the need for a constructive fertility-building program. Oats, peas and vetch hay and Cartier oats were grown and yields of three tons per acre at a cost of $6.98 per ton and 22 bushels per acre at 90 cents per bushel, were recorded. Wheat was sown but owing to severe rust infection only a few bushels were harvested. During the season of 1937 ten acres of land were cleared, ploughed and the necessary surface drainage effected for the 1938 operations.

The live stock have been increased in number, and at the present time two cows, two heifers, two pigs, two oxen, and a few hens are kept.

PALMAROL, ABITIBI DISTRICT

Operator, Joseph Nicol

This station is located ten miles south of La Sarre, serving the districts of Roquemaure, Palmarol, and Duparquet. Preliminary work on this farm was done in 1936, and one field prepared for the cropping in 1937. The farm comprises an area of 110 acres of which 90 are under cultivation. A rearrangement of the farm layout has been made to allow for the establishment of a six-year rotation. One field was seeded down with a grass and clover mixture at the rate of 20 pounds per acre, and the plans for work at this point provide for the improvement of two fields each year. An important project to be considered on this farm is the drainage of the fields to allow more extensive cultivation of the various crops, and to increase the productivity of the soil.

During 1937 the yields per acre and costs of producing the various crops grown on this farm were as follows: Potatoes 300 bushels at $0.21 per bushel; oats, peas and vetch hay 1·75 tons at $14.79 per ton; oats 20 bushels at $0.91 per bushel; and mixed hay 1·5 tons at $6.07 per ton.

The live stock on the farm comprises nine cows, five heifers, one pure-bred Ayrshire bull, one sow, two horses, and a small flock of hens. Each cow's milk is recorded daily, and the produce from the herd is sold in the town of Duparquet. The dairy cattle have been tuberculin tested as the initial step in a constructive herd improvement program.

SENNETERRE, ABITIBI DISTRICT

Operator, Benoit Caron

Station operations, which were begun in 1936, will deal with the problems incidental to the townships of Senneterre and Belcourt. The farm comprises an area of 200 acres of which 70 acres are under cultivation. The tillable area has been divided to conform with a six-year rotation, and in 1937 potatoes; oats, peas and vetch hay; oats; barley; wheat and mixed hay were grown.

Prior to station work, no constructive rotation was in practice on this farm, hay being the main crop grown for many years. Cartier oats succeeded very well in 1937, but the wheat crop was seriously affected by rust and a considerably reduced yield was recorded. The yields per acre and cost of production for 1937 were as follows: Potatoes 208 bushels at $0.36 per bushel; oats, peas and vetch hay 2·5 tons at $10.22 per ton; Cartier oats 44 bushels at $0.32 per bushel; barley 20 bushels at $0.81 per bushel and wheat 15 bushels at a unit cost of $1.37. A yield of 0·75 tons of mixed hay per acre was harvested at a cost of $9.95 per ton.

The live stock enterprise is not extensive as yet, numbering four cows, two heifers, two horses, and one brood sow. The produce from the dairy herd is disposed of at the local creamery.

MONTBEILLARD, TIMISKAMING DISTRICT

Operator, Joseph Corriveau

Station work at this point, 25 miles south of Rouyn, was begun in 1936. The first colonists in this district took up land in 1931, and the average area of cleared land per farm does not exceed 20 acres. The area served includes Beauchatel, Montbeillard, and Rollet, where approximately 400 settlers are located. Early station operations dealt with the division of the 100-acre lot to conform with a six-year rotation and 17 acres were brought under cultivation. In 1937 an additional three acres were cleared, increasing the tillable area to 20 acres. Breaking of new land and drainage are important projects to be considered in this district.

Crops grown in 1937 included potatoes; oats, peas and vetch hay; and mixed hay. The yields per acre and the unit costs of production in 1937 were: Potatoes 228 bushels at $0.40; oats, peas and vetch hay 2·5 tons at $13.40; and mixed hay 1·5 tons at $9.23. Some Cartier oats, barley and Garnet wheat were sown, but unfavourable seasonal conditions and an early frost rendered it impossible to record any yields.

Live stock improvement work is still in the initial stage. Two cows, three heifers, one sow, one ox, and 35 hens are kept, and will form the basis for expansion. A new barn was built in 1936 to more suitably house the live stock and to coincide with a progressive balancing of the agricultural unit.

NOTRE DAME DU NORD, TIMISKAMING DISTRICT

Operator, Adelard Grenier

Early station work began on this farm in 1932 with the establishment of a six-year rotation on 15 acres of land. Other work which consisted of drainage studies as well as the inclusion of alfalfa in the seeding mixture, has resulted in increased yields of highly nutritive forage. In 1936, the average yield of alfalfa hay was 2·5 tons per acre while on the unimproved area only 1·25 tons were recorded. In 1937 the six-year rotation was extended to include the whole farm.

Live stock kept on the farm includes 17 cows, eight heifers, five horses, five brood sows, five ewes, and 125 Barred Rock hens. The dairy herd is headed by

a pure-bred Holstein sire. By practising selection and better feeding, average milk production of the herd has been increased, the low producers being weeded out and replaced by heifers from the higher production dams.

LAVERLOCHERE, TIMISKAMING DISTRICT

Operator, Albert Trudel

The farm comprises a tillable area of 60 acres and in 1932, when station work was begun at this point, a five-year rotation was laid out on a 15 acre area. This preliminary work has resulted in better hay meadows, and a corresponding increase in the production of home-grown grains for live stock. In 1936 the rotation was extended and the whole farm was divided to conform with this cropping system.

The dairy herd has not increased in numbers but the quality of the stock is much improved. The milk production is recorded daily and the low producers culled out. Selected heifer calves are properly reared to replace the poor cows. By selection, better feeding, and the use of a pure-bred bull, it has been possible to obtain a decided increase in average milk production. Hogs are an important enterpise on this farm, and for the past two years five sows have been kept, each producing two litters per year. Young pigs are sold for breeding purposes and the surplus is disposed of on the local market.

Illustration Stations in Western Quebec

W. L. Chauvin, Supervisor

At the present time there are ten illustration stations carrying on an active program of work in the western Quebec district of supervision. This district extends from Campbell's Bay in Pontiac county, including that region on both sides of the St. Lawrence river from the Ontario boundary, to Three Rivers. Seven of these stations are situated on the north, the remaining three being south of the St. Lawrence river. Of the latter, one station is located in each of the counties of Bagot, St. Johns and Laprairie. Three additional stations were established this season, namely at St. Celestin, Nicolet county, St. Zenon, Berthier county, and Ste. Ursule, Maskinonge county, where work will be undertaken in the spring of 1938.

This district is supervised from the Central Experimental Farm, Ottawa, and includes as well some five illustration stations located in eastern Ontario, the report on which is to be found in that summarizing the work on the stations in Ontario. The location of the stations dealt with under this district of supervision are tabulated below, giving the names of the operators and districts where each is located.

W. J. Hayes & Son, Campbell's Bay, Pontiac Co.
Donat Rivard, Clairvaux de Bagot, Bagot Co.
Geo. Ed. Bazinet, Joliette, Joliette Co.
Charles Deland, L'Acadie, St. Johns Co.
Didyme Cote, L'Annonciation, Labelle Co.
Roch Boule, St. Constant, Laprairie Co.
Origene Bournival, St. Etienne des Gres, Three Rivers Co.
Louis P. and Jean J. Legault, St. Hermas, Two Mountains Co.
Wilfrid Guay, St. Jerome, Terrebonne Co.
Charles Turner, Ste. Ursule, Maskinonge Co.

The progress in the work and presentation of the results accruing therefrom has been made possible through the keen interest and active co-operation which has been afforded the supervisor in developing the various activities which will be reviewed under the specific project titles.

Review of Farm Organization and Improvement

CAMPBELL'S BAY, PONTIAC COUNTY

Operator, W. J. Hayes and Son

The farm on which this station is located is situated two miles from the town of Campell's Bay on a well travelled municipal road. This property comprises an area of 124 acres, of which 70 acres are under cultivation. In 1935 it was surveyed, fences re-aligned and a five-year rotation established. The crop sequence is hoed crops, grain seeded down, clover hay, timothy hay, timothy hay. Having a wide frontage, access is made to each of the five fields in the rotation from the public road. The pasture is of a permanent nature and located at the rear of the cultivated fields. It is traversed by a brook, which provides water for the live stock. Associated with this permanent pasture is the farm woodlot. The herd is of Ayrshire breeding, consisting of eleven milch cows, ten heifers and three yearling calves. Two brood sows are wintered each year, the progeny of which are raised on pasture, marketed locally, adding considerably to the farm income.

L'ANNONCIATION, LABELLE COUNTY

Operator, Didyme Cote

This station is situated in the Laurentian district. It has been an important lumbering district, with agricultural developments steadily coming into greater prominence and importance. However, lumbering and the production of charcoal remain important sources of revenue to farmers who generally still have large wood lots. This farm comprises an area of 210 acres of which 80 are under cultivation, the untilled area being heavily wooded and quite hilly. The main station activities include a study of crop rotations and cultural methods best suited to this district. The soil varies from sand to sandy loam, and attention is being given to the fertility aspect with respect to the need for ground limestone and the value of chemical fertilizer to supplement the limited supplies of farmyard manure available. The produce from a herd of 11 grade Ayrshire cows, along with the sale of cattle, veal, and seed grain, are the main contributing lines to the farm revenue.

JOLIETTE, JOLIETTE COUNTY

Operator, Geo. Ed. Bazinet

Mr. Bazinet's farm on which illustration station work is being conducted, adjoins the town of Joliette. This farm comprises 130 acres of flat, heavy clay soil, quite representative of that of the surrounding district. While red clover flourishes here, tests conducted using two tons of ground limestone per acre, have greatly increased the percentage of alfalfa in the hay mixture. In accordance with the general procedure followed, in 1936 this farm was measured, laid out and is being developed on a five-year rotation basis. The crop sequence is hoed crops, grain seeded, clover hay, timothy hay, and pasture. In bringing this plan into effect, needed improvements such as ditching to give necessary drainage, and fencing, are attended to the year the different fields are in hoed crops in the cropping cycle. In this way one field each year receives special attention in the way of permanent and needed improvements. A herd of ten Ayrshire cattle provides the main source of revenue, which in 1937 amounted to $1,454.06. Sales of poultry, hogs, cattle and veal have further contributed to the gross income from this farm.

ST. ETIENNE DES GRES, THREE RIVERS COUNTY

Operator, Origene Bournival

This farm is situated 18 miles from the city of Three Rivers, and eight miles from Shawinigan Falls, and thus is favourably placed with respect to markets for farm products, particularly vegetables and potatoes. The soil is a light sand, rather deficient in organic matter, and presents a problem in crop production. The farm comprises an area of 150 acres, of which 40 at the present time are being developed under a four-year crop rotation, consisting of hoed crop, grain seeded, clover hay, and timothy hay. Pasture is provided from the large area of unimproved land at the rear of the farm. Very definite improvement in crop production has been effected through the systematizing of the cropping program which includes the use of legumes, supplementing manure with chemical fertilizers, and shallow cultivation. While dairy products derived from the herd of eight grade Ayrshire cows are the principal source of revenue, the sales of cash crops such as potatoes, turnips, and canned vegetables have contributed to the extent of $276.47. Two brood sows are maintained throughout the year, and surplus breeding stock and young pigs are disposed of to farmers in the district, the remainder as dressed carcasses in the near-by town of Shawinigan Falls. Poultry is an important phase of the farm activities, and contributed to the extent of $340 to the gross farm revenue.

ST. HERMAS, TWO MOUNTAINS COUNTY

Operators, Louis-Ph. and Jean-J. Legault

This is one of the most recently established stations, the active program of farm improvement being started in the spring of 1937. A five-year rotation of corn, grain seeded, clover hay, mixed hay, and pasture has been laid down on the 62 acres of tillable land, the remaining 40 acres comprising permanent pasture lands and a wood lot, a section of which consists of some 450 sugar maples. The farm is long with a narrow frontage, and as a municipal road traverses the east boundary, entrance to the different fields in the rotation is made from this road. The proprietors are owners of a well-bred exhibition herd of Holstein cattle, which during the past year obtained 72 first, 27 second, 14 third, 12 fourth and 11 fifth prizes at the Toronto Royal, Ottawa, and Provincial Fairs in Quebec. This dairy herd is tuberculin tested, and entered on the R.O.P. herd improvement plan.

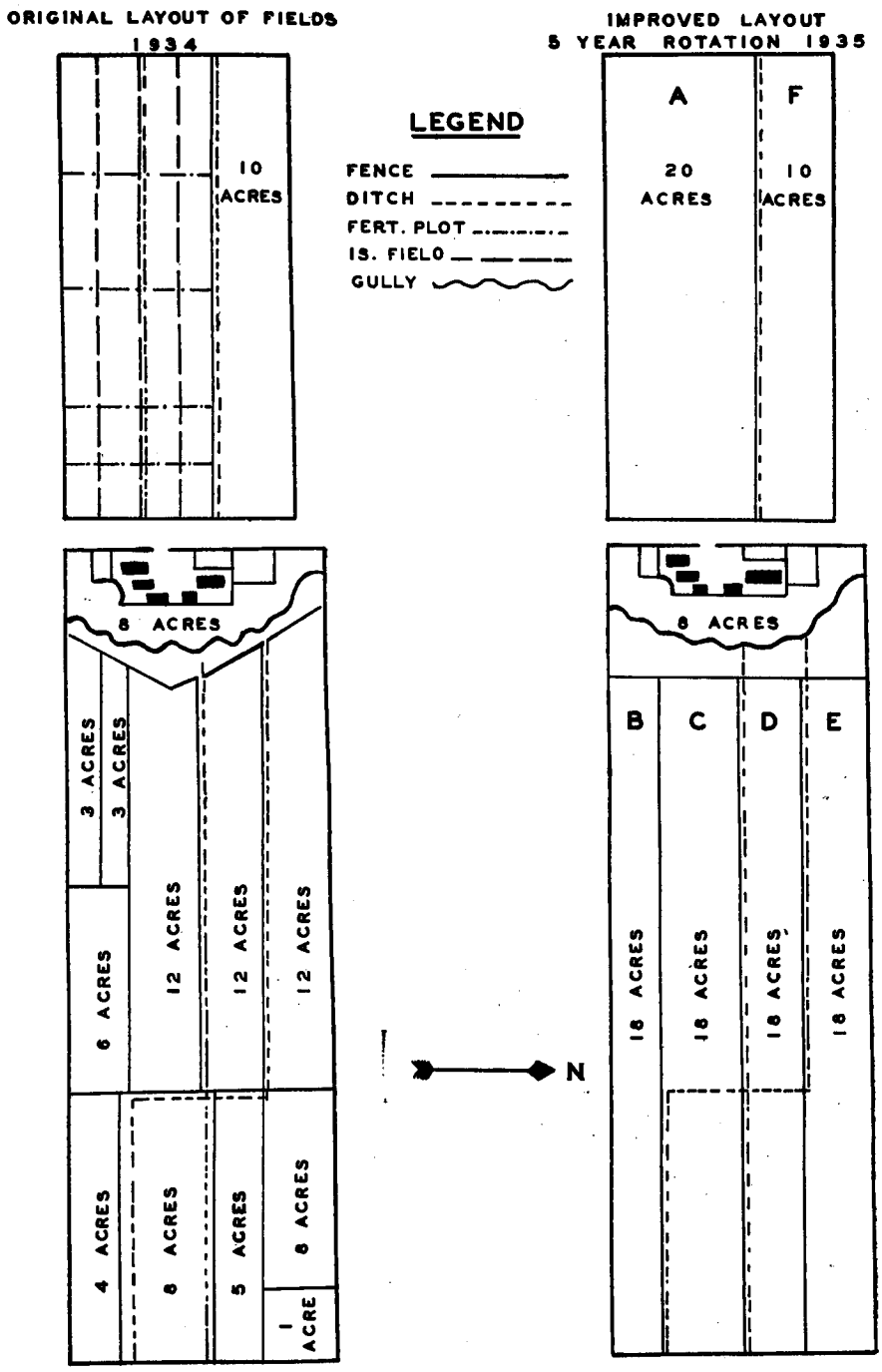
ST. JEROME, TERREBONNE COUNTY

Operator, Wilfred Guay

This station is located three miles from St. Jerome on the highway to Montreal. The program of farm improvement has been under way since 1921, studying rotations and cultural methods deemed to be applicable to the district. Based on earlier experiences, in 1935 the whole farm was organized on a systematic cropping basis, comprising a six-year rotation in which the crop sequence is barley, hoed crops, grain seeded, clover hay, timothy hay, and pasture. A centre lane was laid out connecting the buildings with the six fields, thus making it possible by opening gates, for the cattle to graze either in the pasture area or on the aftergrass as the situation warranted. The dairy herd consists of nine Ayrshire cows, and is in reality the main farm enterprise, although the sales of hay and grain are substantial and amounted to $534.49. A registered Ayrshire sire, purchased from an experimental station, heads the herd. A flock of 60 Barred Rock hens contributes to the gross farm revenue to the extent of $226.09.

ST. CONSTANT ILLUSTRATION STATION

OPERATOR: ROCH BOULE



ST. CONSTANT, LAPRAIRIE COUNTY

Operator, Roch Boule

Being situated some 16 miles from Montreal, the operator of this farm, like those in the district, has ready access to this city market. The soil is a heavy clay, which responds very favourably to timely and proper cultural practices, and the use of lime in stimulating the production of legumes. Based on earlier studies with respect to crop rotations, a six-year cropping program embracing the whole farm of 110 acres was started in 1935. Permanent improvement work such as ditching and fencing will be spread over a period of years with one field in the rotation receiving attention each season. A five-year rotation is in the process of development, the crop sequence for which is hoed crops, grain seeded, clover hay, timothy hay and pasture, with an additional field set aside for alfalfa growing. As the situation requires, this alfalfa field will be broken up, laying down one of the other fields when reseeding is needed. The accompanying diagrams illustrate the layout of this farm with respect to fences, etc., prior to the establishment of the new rotation, also the rotation plan which is being developed as from 1935. Associated with the developments in field crops and general farm organization, an active program of live stock and poultry improvement is also being carried out. A herd of 16 grade Ayrshire cows, headed by a pure-bred sire purchased from the Central Experimental Farm, Ottawa, is maintained, and contributes to the main source of farm revenue. The flock of 186 Barred Rock hens has proved a profitable enterprise, and contributed to the farm income to the extent of $659.04.

L'ACADIE, ST. JOHNS COUNTY

Operator, Charles Deland

Illustration station work was started on this property in the spring of 1937. The 121-acre farm was measured and a five-year rotation established, in which the cropping sequence is hoed crops, grain seeded, clover hay, mixed hay, and timothy hay. A pasture adequate to carry the live stock kept was laid off adjoining the buildings. Here a comparative trial to study the effect of chemical fertilizer on permanent pasture land is being carried on. The operator, Mr. Deland, has during the year made a number of important permanent improvements to his buildings, including remodelling and painting, also construction of a silo and poultry house. The hog pen was moved to a more favourable location, remodelled and a hog rotation of rape; oats, peas and vetch; and clover, laid down as pasture for the 20 hogs kept. Being a flat, heavy clay farm, it is necessary to give due consideration to drainage. This is being provided for by the ploughing of the different fields into wide lands and by open ditches. The sale of dairy products, hogs, poultry and the growing of specialized crops for canning purposes goes to make up a substantial farm revenue. During the year the sale of corn on the cob and green peas, disposed of to the nearby cannery, totalled $354.42. The growing of cash crops, associated with the dairy enterprise, is of very practical importance in this district.

ST. SIMON, BAGOT COUNTY

Operator, Donat Rivard

During 1936 this 90-acre farm was measured and laid out on a five-year rotation, in which the cropping program is hoed crops, grain seeded, clover hay, mixed hay, timothy hay. A 13-acre permanent pasture near the buildings is being built up by the use of chemical fertilizers to a higher carrying capacity. This operator has made very definite progress as a grower of registered seed, and during the crop season of 1936, some 100 bushels of Cartier oats, 175

bushels of O.A.C. No. 21 barley, and 1,800 pounds of timothy seed were disposed of to 25 neighbouring farmers. Sales of dairy products, hogs, poultry and seed grain constitute the principal sources of revenue. A pure-bred Ayrshire herd is maintained, with sales of breeding stock in 1936 amounting to $1,150. The flock of Barred Rock poultry added to the farm revenue. This flock is blood tested for pullorum and thus serves as a centre from which neighbouring farmers may procure breeding stock.

Illustration Stations in Central Quebec and Lake St. John District

J. D. Belzile, B.S.A., Assistant Chief Supervisor

During the year 1937, 14 illustration stations were in operation in this district of supervision, which comprises six of the 20 provincial divisions of the Quebec Department of Agriculture. Twelve of these stations are located in the central Quebec section, serving 13 counties on the south shore of the St. Lawrence river eastward from Shefford to Dorchester, inclusive. The remaining two stations are serving the lake St. John district.

Program of Work and Community Interest

The program of work is adapted to local farm problems of the various districts where the stations are situated. The different activities undertaken by the division in co-operation with the operators may be classified under the two following headings: (1) Farm management, which includes organization of production, farm layout, and all problems related to agricultural economy, thus aiming to provide a labour income for the owner and his family. Efforts are being made to encourage an increase in the productive capacity of the farms in the various districts. To illustrate the progress made in this connection, comparative figures are given under some of the individual station reports, showing the average production in recent years in comparison with that for the year previous to the establishment of illustration station work on the farm. (2) Fact finding and crop test work, which comprises the experimental part of the program as carried out at each station in close co-operation with the various research divisions of the Experimental Farms Service.

Each station aims to serve a certain agricultural area in its vicinity. Farmers residing in this area, which usually does not extend more than 15 miles from the station, are invited to attend the annual meeting organized by the Supervisor in co-operation with the local Agronome. The increasing attendance at field days shows the interest created and the appreciation of farmers for this demonstration work, thus giving ample proof of its usefulness. During 1937 a total of 4,104 persons attended the 12 Field Days organized on the illustration stations in central Quebec and lake St. John district, giving an average attendance of 342 at each point. Field Days held on the stations, during the growing season, are becoming the most important agricultural events of these rural districts.

Ready co-operation is given at all times by the various operators throughout the district. Their intense interest and painstaking labour have not only been for the improvement of their individual holdings, but also with the idea in mind of rendering a real service to the community. The different operators and the members of their families have contributed in no small way to the relative success of the different projects undertaken.

This report gives a short summary of the activities of the stations, operated during the past four years, in this district of supervision. The first part deals briefly with the history and organization of the stations, along with the type of farm owned by each operator. The second part shows the results of the main projects being studied and demonstrated on the area devoted to the illustration station work.

In order to obtain a more favourable compilation and comparison of results, the stations are listed geographically rather than alphabetically, as was formerly done in previous reports.

Description and Organization of Station Farms

South Roxton, Shefford County

Operator, A. F. Sanborn and Son

This farm is quite typical of the average farm in the county of Shefford. The total area is 195 acres, of which 85 are cultivated. An eight-acre sugar bush is situated close to the highway and thus is easily accessible for tapping. The remainder of the farm is in rough pasture, more or less covered by hardhack. Special demonstrations have been conducted on the pasture land since 1932. An area of 15 acres was fenced into three fields of five acres each, on which different fertilizer treatments were applied in order to find the possibilities of improving the quality and grazing capacity of the pasture. A large area of similar soil in the district gives general value to this work.

An area of 16 acres has been devoted to illustration station work since 1928 and cultivated under a cropping plan based on a five-year rotation. During the fall of 1934, the farm was measured in order to establish a six-year rotation on the whole area, with provision for permanent alfalfa fields.

During the four-year period covered by this report, the average crops annually harvested on the 85 acres of tillable farm land were: 20 bushels wheat, 415 bushels oats, 42 bushels barley, and 90 bushels mixed grain (early oats and barley), giving an average annual cereal production of 567 bushels; 80 tons hay, of which some 40 per cent was legume (clover and alfalfa); 5 tons oats, peas and vetch fodder; 18 tons silage corn; 22 tons field turnips and 106 bushels potatoes.

The herd of 23 Ayrshire cows, almost all pure-bred is headed by an Ayrshire bull in Advanced Registry class A, sheep, swine, hens and bees are also kept. The dairy herd was tuberculin tested during the year with no reactors, and baby chicks were hatched on the farm from pullorum-tested stock.

Plessisville, Megantic County

Operator, Eudore Jutras

This is the oldest illustration station in operation in central Quebec, having been established in 1920. The farm is situated on the provincial highway, "Quebec-Sherbrooke via Richmond" one-half mile from the town of Plessisville, which is one of the most important agricultural centres in this part of the province of Quebec, called Les Bois Francs. The area of the farm is 105 acres, almost entirely under cultivation.

Twenty acres of land, cultivated under a six-year rotation, were devoted to demonstration and test work until 1931. Since 1932, the whole farm has been operated on the basis of a six-year rotation, providing three seven-acre fields outside of the rotation, on which a permanent pasture is being developed. This is one of the most important agricultural problems of the district, as dairying and production of pork are the main sources of farm income. So far very satisfactory results have been obtained, and it is expected that in the near future the three fields, forming a total area of 21 acres, will provide sufficient good quality grazing for all the stock kept on the farm. In the past it has been necessary to use as much as 40 acres of land to pasture the live stock.

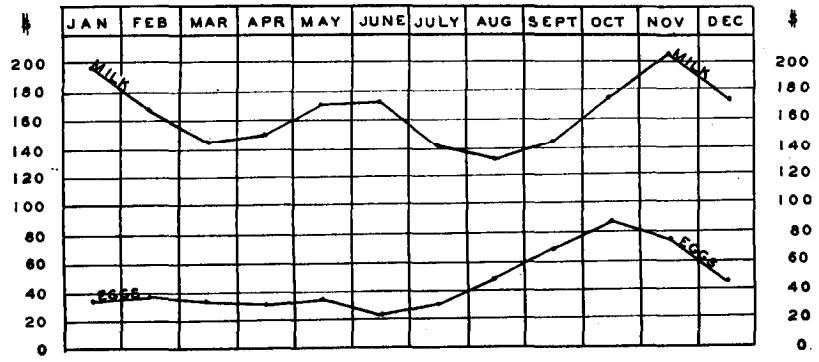
The farm layout provides also for using one field of the general rotation as a permanent alfalfa field when this legume is satisfactorily established. Hence,

the length of the rotation is reduced from six to five years, which is the most suitable to the type of farming and quality of soil generally found at Plessisville and in the surrounding districts.

The live stock set-up includes: one Holstein bull, Advanced Registry class AA, 18 milch cows, four heifers, and 120 hens. The dairy herd has been periodically subjected to the tuberculin test and none of the cattle have reacted for several years. The poultry flock received the blood test for pullorum in October, 1936, with 12 reactors out of a total of 195 birds.

During the period 1934 to 1937 inclusive, the average kinds and quantities of crops annually harvested were as follows, with comparative figures for 1920 when station work was established, shown in brackets: Oats 745 bushels (500); barley 205 bushels (50); mixed grain 40 bushels (none); clover hay 20 tons (15); alfalfa hay 20 tons (none); timothy hay 40 tons (40); O.P.V. fodder 2 tons (none); silage corn 40 tons (none); turnips 45 tons (20); and potatoes 80 bushels (75).

MONTHLY MILK AND EGG SALES AT THE PLESSISVILLE STATION DURING 1937



The above graph indicates the monthly income from the sale of milk and eggs during the year 1937 on the Plessisville illustration station. It will be noted that through the organization of the dairy and poultry enterprises at this point, a relatively constant monthly revenue has been derived. The total income received from the sale of dairy products amounted to $1,980.11, giving an average of $165.01 per month. It will be noticed also that the lowest monthly revenue, namely $134 was in August, while the highest, which was $207, was obtained in November. The poultry enterprise contributed a total of $556.82 for the year, giving an average monthly revenue of $46.40, with a monthly variation throughout the year ranging from $20.92 in June, to the maximum of $87.10 in October.

LAURIERVILLE, MEGANTIC COUNTY

Operator, Achille Vachon

Mr. Vachon is proprietor of a 100-acre farm, entirely under cultivation. The soil is of the sandy loam type, representative of the soil of this part of Megantic county, rather lacking in fertility owing to the fact that this land has been cropped since 1850. Consequently the main problem is one of building up fertility. The fertilizer demonstrations have been giving most interesting results as shown in the second part of this report where the fact-finding projects are reported. The station has been operating since 1928,

at which time an area of 16 acres was laid out in a four-year rotation with the following crop sequence: First year, hoed crops; second year, cereals seeded down; third year, clover hay, and fourth year, mixed hay.

In 1934 a special demonstration on pasture improvement with chemical fertilizers was started, aiming to find the most economical way of providing adequate grazing for the live stock, especially the dairy herd. A six-acre field was selected for this work and divided into two fields of three acres each, one of which received the following fertilizer treatments in 1934: 350 pounds of superphosphate, 150 pounds sulphate of ammonia, and 100 pounds of nitro-chalk per acre. In 1935 and 1936, this same field received a further application of 100 pounds per acre of nitro-chalk. The other field has been kept as a check. So far the grazing capacity has been more than doubled on the field treated with fertilizer, and the result shows the possibility of economically improving the pasture land of this farm.

At the end of the 1936 cropping season this farm was measured with a view to arranging a new layout, in order to apply a systematic and more suitable crop rotation. This new layout provides for the operation of a five-year rotation on a corresponding number of fields, each approximating 12 acres in area, to be cultivated in the following crop sequence: First year, hoed crops (chiefly potatoes); second year, cereals seeded to grasses and clover; third year, clover hay (two cuts); fourth year, mixed hay and fifth year, mixed hay or pasture. With the establishment of a permanent alfalfa field, the above crop sequence will revert to a four-year rotation. The new layout provides also for the establishment of a permanent pasture located in close proximity to the farm buildings.

When illustration station work was established on this property in 1928, only four kinds of field crops were grown, oats, 400 bushels; hay, 30 tons; corn, 20 tons; and potatoes, 300 bushels. The average annual yields of the nine crops grown during the period 1934-37 inclusive, are as follows: 627 bushels of cereals (comprising 24 bushels wheat, 528 bushels oats, 4 bushels barley, and 71 bushels buckwheat); 167 pounds clover seed; 270 pounds timothy seed; 41 tons hay; 5 tons O.P.V. fodder; 22 tons corn; 24 tons turnips and 1,385 bushels potatoes. It is worthy of note that a decided increase in the number of crops grown at this point has been effected through a more diversified farm program.

Since the establishment of this station, the operator has been giving special attention to improving the quality of live stock. The increase in the production of farm food stuffs also permits of the raising and better feeding of a larger number of live stock. The dairy herd, headed by a registered Ayrshire bull, has been subjected to the tuberculin test with no reactors. Also the poultry flock annually receives the blood test for pullorum. Four brood sows are maintained.

LOTBINIERE, LOTBINIERE COUNTY

Operator, Marc Moraud

An illustration station has been in operation on this farm since 1932. The property is situated on the provincial highway, Levis-St. Lambert, in one of the oldest settled parts of the country. The district is favoured with a clay loam soil naturally fertile. The two main problems to consider are weed control and drainage. Wild mustard infested nearly all the cereal fields. However, on the illustration station some improvement is noticeable, but many parts are still infested. The policy has been to prevent the mustard from ripening. In 1936 and 1937 a part of the cereal field that was too heavily infested for hand pulling received the drastic treatment of being cut green and taken as hay.

Since the establishment of this station, the operator has considerably improved the drainage condition of several fields by widening and rounding up the ridges, deepening the ditches, and removing old ditch banks. This permanent improvement work is done gradually, so that the drainage condition of the whole farm will be improved in a few years.

The live stock kept on this farm, at the time of the inventory taken in December, 1937, was as follows: Six horses, one registered Ayrshire bull, twelve dairy cows, five heifers, two brood sows, and a small flock of hens. There is still much to be done in improving the live stock, particularly in milk production, which was below a 4,000-pound average per cow when work was started on this farm. Each year a few low producers are disposed of for meat and replaced by young heifers of better breeding. Careful attention also is given to the selection, raising and feeding of calves. In this connection the growing of an abundant supply of good quality legume hay and grain has been of great assistance.

Since the establishment of illustration station work on this farm, an agricultural field day has been held each year during the growing season. These meetings are always well attended. In 1937 it was estimated that some 475 persons were present, including farmers from Lotbiniere, Ste. Croix, St. Edouard and Leclercville.

ST. APOLLINAIRE, LOTBINIERE COUNTY

Operator, Jos. Cote

This station was established in 1925, with the object of rendering a service, which had hitherto not been undertaken in this southeastern section of Lotbiniere county. Since that time a four-year rotation has been operated on an area of 19 acres and is devoted to general crop demonstration and fertilizer test work. Before the organization of this station, the land was suffering from improper drainage, resulting in very late seeding and often complete crop failure, especially with hoed crops during wet seasons. In accordance with the advice given by the Supervisor, the operator has achieved important drainage improvement by widening and rounding up the ridges, deepening the ditches, also levelling and removing old ditch banks.

It may be noted from the accompanying diagram that in reorganizing the cropping program on this whole farm under a systematic rotation, very few changes in the field divisions were necessary. The removing of two fences, each about 400 feet in length, was all that had to be done in order to have six fields approximately equal in area.

The following average quantities and kinds of field crops were harvested annually on this farm during the period 1934-37, as compared with those produced in 1924, which are shown in parentheses, the latter being the results of the year previous to the establishment of illustration station work on this farm: Wheat, 12 bushels (none); oats, 364 bushels (250); barley, 19 bushels (none); buckwheat, 15 bushels (none); mixed grain, 50 bushels (none); timothy seed, 212 pounds (none); clover seed, 20 pounds (none); clover hay, 30 tons (none); timothy hay, 30 tons (55); O.P.V. fodder, 2 tons (none); turnips 44 tons (½); potatoes, 90 bushels (75).

The live stock kept includes a herd of dairy cattle, almost all pure-bred Ayrshire, one brood sow, and 116 hens. The herd is tuberculin tested periodically. At the time of the last test there were no reactors. The poultry annually receives the blood-test for pullorum. When tested in October, 1936, only two birds were reactors out of 118, and three out of 130 in 1937.

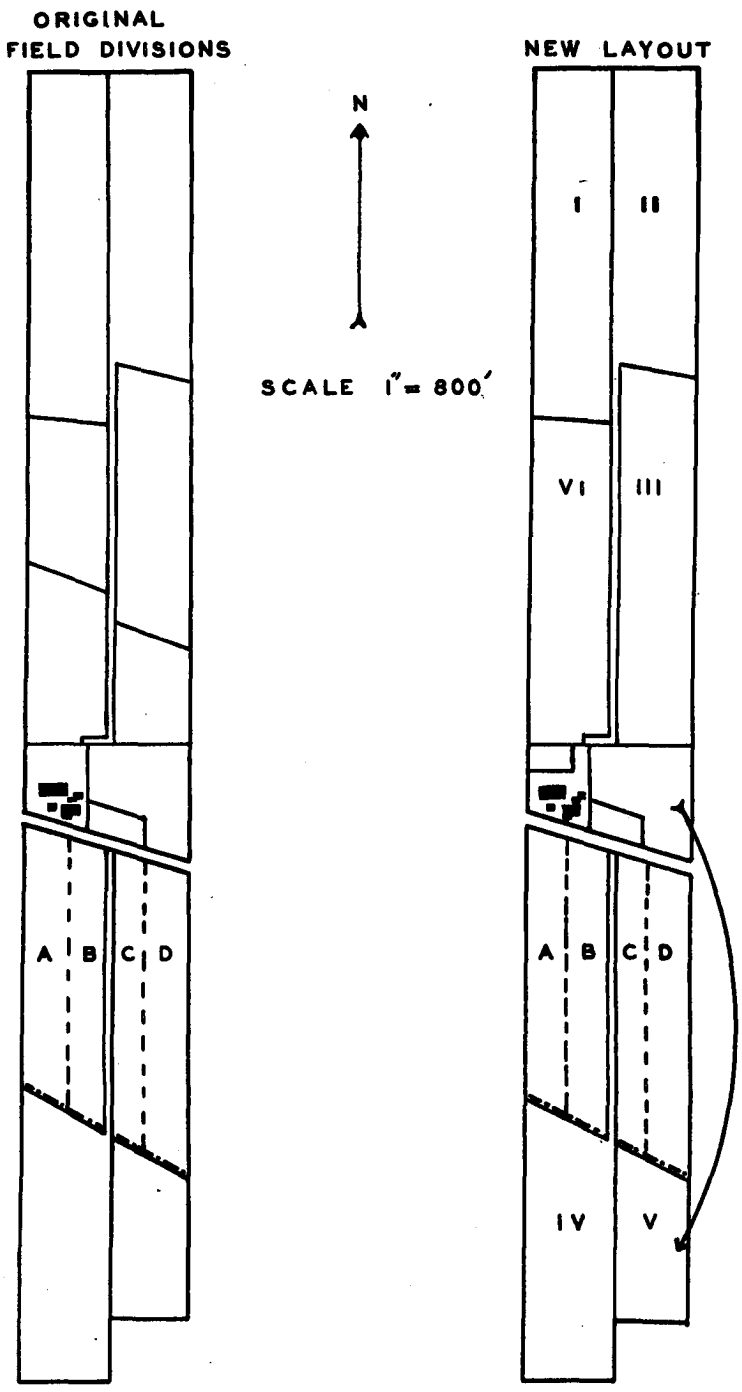


ILLUSTRATION STATION: ST. APOLLINAIRE, QUE.

OPERATOR: JOS. COTE

PINTENDRE, LEVIS COUNTY

Operator, Alphonse Couture

In 1935 this farm was selected to carry on a program of agricultural improvement work especially adapted to the local farm problems and economic conditions. The farm is situated on the provincial highway, Levis-Jackman, five miles south of the city of Levis. Nearly 100 acres of land are under cultivation, with conditions typical of those on other farms in the district. During the summer of 1936, in order to establish a systematic rotation, the whole area was laid out.

The Pintendre district is among the oldest cultivated in this country, having been settled some two and a half centuries ago. The operator, Mr. Alphonse Couture, is a descendant of Guillaume Couture, one of the first Canadian settlers who emigrated from France with Samuel de Champlain at the beginning of the seventeenth century, and represents an unbroken line of landholders for several generations.

The agricultural problems to be dealt with in such an old district are numerous, the most urgent being drainage improvement, control of weeds and restoration of soil fertility. Some ditch banks, which have been accumulating for generations by the earth removed when periodically cleaning the trenches, are interfering with the drainage system. During 1935 the crops grown on this farm were nearly all a failure, due to wet conditions. The application of a systematic cropping program and drainage improvement work are expected to bring about considerable increase in crop yields. An analysis of seed grain produced on this farm the year previous to the establishment of the station, indicates the importance of weed problems in the district. A sample of oats analysed by the Dominion Seed Branch was reported as containing the following weed seeds per pound: 306 seeds of ragweed; two false wild oats; fourteen spurrey; four lady's thumb; two sun spurge; two green foxtail; and fourteen wild tare.

The live stock, which provides the market for most of the crops, will receive attention, in order to improve its quality and productive capacity. The improvement in the field crops should soon permit of the remunerative keeping of more and better milch cows, pigs, and hens. The live stock includes one registered Holstein bull and 13 milch cows; one brood sow, one registered Yorkshire boar, together with some sheep and hens. The poultry were first tested for pullorum in November, 1936, when only two birds were reactors out of a flock of 60. The reactors were disposed of. In the fall of 1937 the flock was again tested, and no reactors were found.

SCOTT JUNCTION, DORCHESTER COUNTY

Operator, Elzear Lacroix

Mr. Lacroix's farm is located in the southwestern section of Dorchester county, some 20 miles south of Quebec city, on the provincial highway, Levis-Jackman. The total area of this farm is 180 acres, of which 109 acres are under cultivation. Since 1924 an area of 11 acres located on the highway has been devoted to illustration work. This land is divided into four equal fields on which a four-year rotation is in operation with the following crop sequence: First year, hoed crops; second year, cereals seeded down; third year, clover hay; and fourth year, timothy hay.

The whole farm was measured in 1933, in order to lay out a definite cropping system on the total area cultivated. Two rotations were adopted, (1) a four-year system to be applied to that part of the farm where the soil is of a sandy nature, and (2) a five-year rotation for the balance of the farm which is favoured with a rather fertile clay loam. Furthermore, the position of the highway and of the railroad which crosses this land are conducive to the laying out

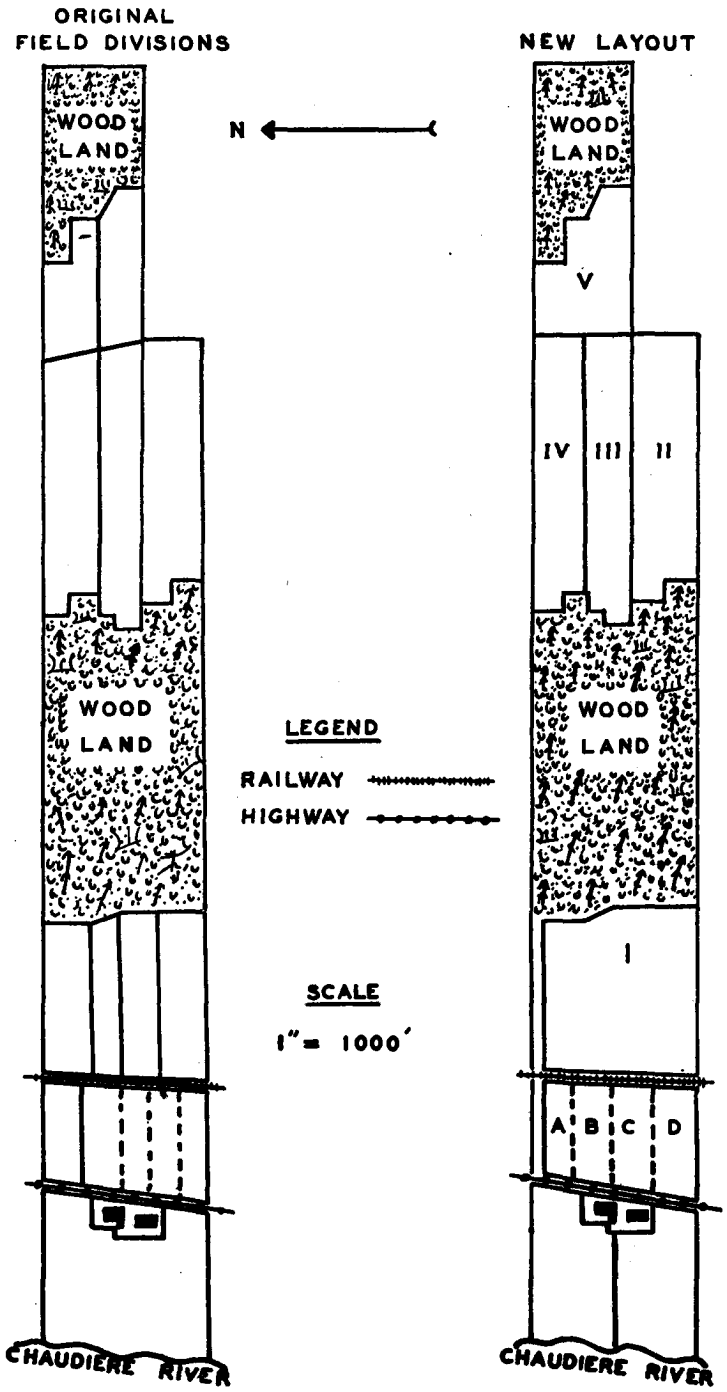


ILLUSTRATION STATION: SCOTT JUNCTION, QUE.
OPERATOR: ELZEAR LACROIX

53513—7

of the land into these two rotation systems. When drawing the new cropping plan, provisions have been made for establishing a permanent alfalfa field and also for the creation of a permanent pasture located on a rich low piece of land situated in close proximity to the farm buildings.

During the 12 years that illustration work has been carried on, the following increases in the production of the principal field crops have been obtained; 1924 yields are shown between parentheses, in comparison with the average quantity and kind of crops harvested annually during the four years covered by this report: Wheat 22 bushels (12); oats 490 bushels (215); barley 46 bushels (18); buckwheat 52 bushels (15); mixed grain 115 bushels (none); clover seed 41 pounds (none); timothy seed 98 pounds (30); hay 82 tons (76); O.P.V. fodder 5 tons (none); turnips 20 tons (4); potatoes 679 bushels (122).

Live stock kept includes a registered Ayrshire bull, eleven milch cows, three brood sows, nine sheep and 65 hens. The dairy herd has been tuberculin tested with no reactors. The poultry flock was tested for pullorum in 1936 for the first time. Seven reactors were found out of 90 birds and were disposed of. None of the 75 birds tested in 1937 reacted.

Considerable work has been done in drainage improvement since the publication of the last report. The buildings are white-washed annually, the fences kept well repaired, and the irreproachable tidiness of the home, its surroundings and yards, make this farm attractive and give a good impression. However, there is still a great deal to be done regarding the betterment of live stock as the milk production per cow is still low when compared with the progress made in field husbandry.

HONFLEUR, DORCHESTER COUNTY

Operator, Alphonse Laliberte

The parish of Honfleur is situated in the east section of Dorchester county, some 15 miles south of the St. Lawrence river. The soil is fertile but generally requires better surface drainage. An illustration station was established at this point in May, 1935, with the object of carrying on demonstration work especially adapted to this district and the adjacent municipalities of St. Gervais, St. Lazare, and Ste. Clarie. A public meeting was held in July of the same year, two months after the opening of this station, at which 250 farmers were present.

The farm has a total area of 274 acres. Of this, 224 acres are under cultivation, leaving 50 acres of wooded land, in which is located a sugar bush of a few thousand trees. Previous to the establishment of this station no systematic rotation was followed. Agricultural lime and chemical fertilizers were not used on this farm, nor in general in the district, apparently due to lack of local information regarding their economic advantages. Farm manure was the only fertilizer used and was applied to the hoed crops at the rate of 20 tons per acre, the remainder being used on the oat fields. Following is an outline of the acreage devoted to the different kinds of field crops during (1) the year previous to the establishment of the illustration station, and (2) the same kinds of crops under the new cropping plan adopted after arranging the tillable land so as to conform with the application of a systematic rotation. The figures in parentheses represent the acreage in the latter case. Hoed crops 2 acres (15 acres); cereals 50 (82); hay 110 (70); and pasture 56 (36). The improvement of pasture and the growing of more legume hay has made it possible to reduce the acreage of these crops, as shown above. Consequently the area for grain and roots has been increased in order to provide larger quantities of these and a better balanced feed supply.

The live stock kept on this farm includes one registered Ayrshire bull, twenty milch cows, three brood sows, fourteen sheep, and 350 Rhode Island Red hens. During the fall of 1936, some 445 birds received the test for pullorum. Out of that number 46 were found to be reactors and were discarded from the flock. Only two birds reacted out of the 365 tested in 1937.

RUISSEAU A L'EAU CHAUDE, DORCHESTER COUNTY

Operator, Alphee Goupil

An illustration station was established on this farm in 1931, when 11 acres of land facing the highway were selected for crop testing work. The area has been cultivated since on the basis of a four-year rotation. In 1936 the whole farm was measured to organize a five-year rotation, with provision for the establishment of a permanent pasture. The farm comprises 200 acres of land, 70 acres of which are under cultivation. The soil texture varies from light sandy loam to loam. The most fertile part of the farm still requires some drainage improvement.

The live stock kept on this farm, as at December, 1937, is as follows: Three horses, one registered Ayrshire bull, eleven milch cows, three heifers, two brood sows, six sheep, and 23 hens. The dairy herd is tuberculin tested regularly. Mr. Goupil also owns a fox ranch which brings in a good cash return each year. The annual Field Day is always well attended at that point, not only by people of the immediate vicinity, but a good representation of farmers from St. Malachie, St. Edouard, and Ste. Germaine, who make long trips, thus showing their interest in the work.

Considerable improvement in the yields of field crops has been obtained. The following data give the average yields of different crops produced in 1936 and 1937 in comparison with those harvested during 1934, which was the year previous to the establishment of the station. The latter are shown in parentheses. Oats 438 bushels (200); barley 19 bushels (none); buckwheat 14 bushels (none); clover hay 15 tons (10); timothy hay 15 tons (20); oats, peas and vetch fodder 2 tons (none); turnips 19 tons (5); and potatoes 90 bushels (40).

ST. PROSPER DE DORCHESTER, DORCHESTER COUNTY

Operator, Eugene Larochelle

Illustration station work was started at this point in the spring of 1933. This farm comprises 80 acres of land under cultivation. It is favourably situated, being located on a well frequented highway close to the village of St. Prosper. An area of 18 acres is devoted to illustration work, and cultivated under a four-year rotation system. The annual Field Meeting is always well attended by delegations of farmers from the parishes of St. Prosper, Ste. Aurelie, St. Zacharie, St. Benjamin, Ste. Rose de Watford, and St. Louis de Gonzague, which form the district that this station aims to serve.

The inhabitants of this southern part of Dorchester and Beauce counties neglected their farms during the world war and that after-war period of prosperity, when they were generally engaged in lumber exploitation. For the last few years, because of the decline of lumbering and allied industries in the vicinity, they have been forced to depend on their farms for a living, which in turn necessitates improvement in both crop production and live stock. Consequently the illustration station is called upon to render a much needed service.

When this land is well cultivated and adequately fertilized it responds favourably and satisfactory crops are obtained. The results to date, mentioned in the second part of this report, are very encouraging. Dairy cattle, sheep, hogs and hens make up the live stock enterprise on this farm. The dairy

herd was subjected to the tuberculin test, and the poultry flock received the blood test for pullorum with 17 reactors out of 100 birds in 1934, ten out of 140 in 1936, and only two out of 100 birds in 1937.

ST. EVARISTE DE FORSYTH, FRONTENAC COUNTY

Operator, Charles Veilleux

A fertilizer station was established in 1928 on this farm and operated as such until 1931, when it was replaced by the regular illustration station. Since that time 16 acres of land have been devoted to test work and demonstrations of different cultural methods. This land is divided into four plots and operated on a four-year rotation with the following crop sequence: hoed crops; cereals seeded down; clover and alfalfa hay; timothy and alfalfa hay.

Owing to the large area of rough, stony permanent pasture land in Frontenac county, a special study is being given to the pasture problem. Six acres of representative pasture land were selected for this purpose. During the spring of 1935 an area of three acres was fertilized as follows: 350 pounds superphosphate, 150 pounds nitro-chalk, and 100 pounds potash per acre. These commercial fertilizers were applied early in May, and at the same time the old sod was torn up with a diamond tooth harrow and seeded down with the following pasture mixture: Red clover, two pounds; alsike, two pounds; timothy, four pounds; Kentucky blue grass, two pounds; red top, two pounds; white Dutch clover, two pounds; orchard grass, two pounds; and alfalfa, four pounds. The other three-acre field is kept as a check for comparison of results. The results of this work are reported in the summary dealing with pasture improvement.

In 1937 Mr. Veilleux wintered the following live stock: Two horses, two oxen, one registered Ayrshire bull, ten milch cows, seven heifers, two calves, one brood sow, fourteen ewes, one registered Leicester ram, and 30 hens. The dairy herd was tuberculin tested, and the poultry flock received the blood test for pullorum in 1936 and 1937. By means of better feeding and intelligent selection, the general quality and capacity of production of the live stock has steadily improved since the establishment of the station.

Following is a list of the average quantities and kinds of field crops harvested during the period 1934-37, together with those produced in 1928 when the station was started; the latter figures are shown in brackets: Wheat, 28 bushels (none); oats, 384 bushels (300); barley, 17 bushels (8); buckwheat, 24 bushels (none); mixed grain, 28 bushels (none); peas, 12 bushels (none); clover seed, 30 pounds (none); mixed hay, 42 tons (20); O.P.V. fodder, 2 tons (none); turnips, 33 tons (none); and potatoes, 206 bushels (100).

ST. NEREE, BELLECHASSE COUNTY

Operator, Lazare Asselin

This station was established in May, 1937, with a view to serving this district which includes the municipalities of St. Neree, St. Lazare, and Armah. Mr. Asselin, the operator, is one of the pioneers of this region. The land is hilly and very stony. Some fields which are practically covered with large stones weighing a few tons each will be left uncleared, and will be used as permanent pasture. A program of fertilizer test work will be instituted in the spring of 1938 on the rough pasture. The patches of soil not covered with stone appear to be fertile, and it is expected that it will be possible to build up good pasture. This problem is of general interest because large areas of land in the district are similar.

Over 250 persons attended the Field Day held in July, 1937, when the farm was visited and the general improvement plan discussed. This included the establishment of a systematic rotation in order to increase the production

of legume hay, grain and roots, improvement of permanent pasture by fertilization and better management, planting of an orchard for home consumption, and the modernization of the vegetable garden. Special attention will also be given to live stock, which will provide the market for most of the field crops harvested.

During 1937 the following field crops were harvested: Oats, 200 bushels; barley, 20 bushels; hay, 33 tons; corn, 1 ton; turnips, 4 tons; and potatoes, 95 bushels.

Live stock on the farm in December, 1937, included one horse, two oxen, one bull, eleven dairy cows, five heifers, two calves, one brood sow, five sheep, and eighteen hens.

Illustration Stations in Lake St. John District

Since the establishment of an experimental station at Normandin in 1936 to serve the lake St. John district, the illustration stations located in that area have been supervised by the Superintendent of the experimental station.

Field Days were held annually during the growing season at each station, and generally a large number of farmers attended. The layout of the farm was explained, as well as the organization of the cropping system, fertilization of permanent pasture, live stock problems, etc. The interest shown by those present indicates that these field days serve a useful purpose. As farmers submit their problems for discussion, officers of the experimental stations are better able to appraise the problems which require study at the experimental station or on the local illustration station.

The season 1937 was one of the best experienced in this district. Although the yields of all crops were a little below average, the quality was exceptionally good. The district is one of the few in the province of Quebec where good seed grain was produced. Seeding commenced on May 1, in the region of Chicoutimi, while it was not general until May 22 in lake St. John county. However, it was well done and terminated in good time. A slight frost was registered at Normandin on June 30, but no damage resulted to any of the crops except in low-lying places. Precipitation during the growing season was sufficient, except for two periods of drought during July and August which affected the yield of hay and stunted the grain. The weather was favourable during haying operations, and for the maturing of grain and harvesting. The crops were all removed from the fields in good time and the fall ploughing terminated relatively early.

DELISLE, LAKE ST. JOHN COUNTY

Operator, Eugene Maltais

Station operations started in the spring of 1935 on this farm. The property comprises an area of 100 acres, all tillable land. The whole farm has been divided into five 20-acre fields, and the following crop rotation is being adopted, outside of a 20-acre permanent pasture field: Hoed crops, O.P.V. mixture, and grain not seeded; cereals seeded down to clover and timothy; clover hay; mixed hay.

Surface drainage was lacking, but has been considerably improved by the adaptation of the Richard method of ploughing, and the deepening of ditches where necessary. However, the full benefit of this work will not be derived until one cycle of the rotation is completed. The operator's greatest handicap is the relatively small number of animals kept on the farm. In 1936 six dairy cows were milked, no pigs were raised, and only a few hens were kept. In 1937, however, eight cows were milked, one litter of pigs raised on the farm, and the gross revenue shows an increase over the previous year.

The following table gives the yield per acre and the cost per unit of growing the different crops in 1937 on the areas devoted to illustration test work:—

Crop	Fertilizer treatment per acre	Yield per acre	Cost per unit
			$ cts.
Potatoes	16 tons manure	144·00 bush.	0 49
	16 tons manure plus 500 lb. 2–12–6 fertilizer	156·00 bush.	0 46
Turnips	16 tons manure	12·00 tons	3 07
	16 tons manure plus 500 lb. 2–12–6 fertilizer	13·00 tons	3 33
O.P.V. hay		2·18 tons	13 62
Banner Oats		25·00 bush.	0 91
Mixed hay		1·25 ton	10 50

The application of commercial fertilizer has given an increased yield of both potatoes and turnips, over the area manured only. For the potato crop the increase in the yield has been sufficient to reduce the cost of production per bushel from 49 cents to 46 cents. However, the application of commercial fertilizer to supplement manure, did not prove profitable on the turnips, low yields being obtained on both fields due to late seeding and poor drainage conditions. The extremely low yield of the oats, peas and vetch hay resulted largely from poor germination, caused by late seeding.

STE. ANNE DE CHICOUTIMI, CHICOUTIMI COUNTY

Operator, John Boucher

This station was established in the spring of 1936, on a farm of 134 acres. Two separate crop rotations were laid down, the one on light sandy loam being devoted to the growing of hoed crops, mostly potatoes, the crop sequence being as follows: Hoed crops; cereals seeded to clover and timothy; hay or clover seed production; timothy hay. The second rotation, which takes in the balance of the farm outside of the permanent pasture is as follows: Oats, peas and vetch hay or grain not seeded; cereals seeded to clover and timothy; clover hay; timothy hay.

Surface drainage on this farm was inadequate, and the operator is proceeding to improve this condition. The land was divided and ploughed according to the Richard system; with furrows and ditches dug out where necessary. The yield and cost of growing the different crops are given in the table which follows:—

Crop	Fertilizer treatment per acre	Yield per acre	Cost per unit
			$ cts.
Potatoes	16 tons manure	210·00 bush.	0 27
	16 tons manure plus 500 lb. 2–12–6 fertilizer	240·00 bush.	0 25
Turnips	16 tons manure	13·30 tons	3 21
	16 tons manure plus 500 lb. 2–12–6 fertilizer	17·70 tons	2 55
Oats, Banner		33·30 bush.	0 49
Hay, Mixed		0·95 ton	8 66

It is interesting to note that where fertilizers were applied, the crops have responded to their application. The yields of potatoes has been increased by 30 bushels on the area where manure has been supplemented with 500 pounds of 2-12-6, over the check plot treated with manure alone. At the same time the cost of production per bushel has been reduced from 27 cents to 25 cents as a result of the use of chemical fertilizer in combination with farmyard

manure. As shown in the above table, similar results have been obtained in the yield and cost of production of turnips. The low yield of oats was due to both lack of proper surface drainage and periods of drought during the growing season. However, the quality was good. The low yield of hay was attributed to the low fertility of the soil, and also to the previous severe winter and drought.

Illustrations Stations in Eastern Quebec

R. Caron, B.S.A., Supervisor

During the four-year period 1934-1937, there were 18 illustration stations operating in the eastern Quebec supervisory district surrounding the experimental station, Ste. Anne de la Pocatiere. This district comprises the lower St. Lawrence river valley, and the Gaspe peninsula.

The work relating to farm organization, and the improvement program in the process of development on each station in this area is reviewed and dealt with in geographical order, from west to east.

ST. PIERRE D'ORLÉANS, MONTMORENCY COUNTY

Operator, Adelard Rousseau

This farm is situated on the island of Orléans, 15 miles from Quebec City. Illustration station work was begun in 1927, the initial study projects being a survey of crop adaptation and the eventual establishment of a suitable cropping sequence. In 1936 a five-acre field was laid down in permanent pasture to provide adequate grazing for the live stock kept.

Live stock improvement work began with the keeping of individual production records, weeding out the low producers, and in 1930 a registered sire was purchased. The average milk production of this herd has been increased from 3,299 pounds in 1929 to 5,225 pounds of milk per cow in 1937. Hogs are gaining in importance on this farm, commencing with the purchase of an Advanced Registry Yorkshire sow in 1934, the herd now comprises a number of pure-bred sows headed by an Advanced Registry boar.

The poultry flock constitutes an efficient unit of the farm organization. The initial purchase of 300 Barred Rock baby chicks from the experimental station at Ste. Anne de la Pocatière was made in 1936. Housing conditions have been improved through the erection of a new poultry house in 1936, and the wintering over of 125 to 140 pullorum-tested and selected pullets each year is part of the farm program.

ST. VALIER, BELLECHASSE COUNTY

Operator, Albert Aubé

This farm comprises an area of 50 acres of fertile soil fairly high in humus content, and about six acres of relatively light sand. Station operations were begun at this point in 1929, the initial work being directed to the study of a suitable crop rotation. At the present time two rotations are being developed, a four-year on the heavier and more fertile soil, and a three-year potato rotation on the light sandy area. Hoed crops and legume hays are featured in the main rotation with the object of providing ample roughage of a high nutritional value for live stock. A permanent pasture was laid down in 1933 and has proved to be a distinct asset, in that it supplies good fresh herbage throughout the grazing season.

Through the eight years of station operations the common stock has been weeded out and at the present time the dairy herd comprises twelve registered Ayrshire females and one grade, headed by a registered Ayrshire sire.

An Advanced Registry Yorkshire sow was purchased in 1935 as the initial step in the expansion of this branch of the farm organization. A modern poultry house was constructed in this same year, and the farm program makes provision for the wintering of 100 to 125 selected Barred Rock pullets each year.

Throughout the operations at this point, an attempt has been made to carry out a plan of improvement which would be worthy of emulation in the district.

ST. CAMILLE, BELLECHASSE COUNTY

Operator, Polydore Labbé

Since 1929, the year of establishment, the station at St. Camille has been the centre where trials have been conducted relative to fertility problems and improved cultural practices. The soil in this district is relatively poor, and a four-year rotation of crops has been found suited to the production of sufficient home-grown feed for the live stock, along with improvement in fertility. Owing to its high elevation, there is a tendency towards a short growing season and only those crops or varieties which are classed as short seasoned are certain of success. The total tillable land on the farm comprises an area of 40 acres, but each year some new land is brought under cultivation.

During 1936 and 1937 a permanent pasture program was instituted on this farm and trials relative to the value of ground limestone in combination with chemical fertilizers have been under consideration.

ST. PAUL DE MONTMINY, MONTMAGNY COUNTY

Operator, Ernest Gosselin

This farm is situated in the southern part of Montmagny county. Illustration station work was commenced in 1932, and a study directed to fertilizers was the first project considered. Swede turnips were introduced as a field crop and have since served as a valuable source of succulent winter feed for live stock. The soil on this farm is rather low in fertility and the four-year rotation system, which was originally conducted on a small trial area, has been extended to take in the whole farm. This rotation is suitable for soils of this type in that it allows for the application of manure every four years, as well as deriving the beneficial effects from the ploughing down of a clover or timothy sod. In 1935 a 12-acre field was set aside from the main rotation fields and a three-year potato rotation laid out. Commercial fertilizers are used to supplement the farm manure. The operator has acquired a reputation as a producer of high quality seed and in 1937 disposed of 260 bushels of grain and 240 bushels of potatoes to farmers in the surrounding districts. Cartier oats is featured as an early maturing variety suitable to local conditions.

The buildings and surroundings have been improved since the inception of station work. The barn has been remodelled to better house the dairy herd, which is being constantly improved by selection and the use of high quality registered sires. Hogs are kept and in 1937 the operator purchased an Advanced Registry boar of the Yorkshire breed, and whose services are available to the farmers in the district.

L'ISLET, L'ISLET COUNTY

Operator, J. C. Lemieux

This farm is one of the most progressive in the eastern Quebec district of supervision. The soil in this area is generally stony, but of good fertility, and the flat topography of the land ensures a constant supply of moisture as very little run-off occurs. Station operations commenced in 1929, suitable rotations,

clearing of land, and soil drainage being the first projects considered. During 1933 and 1934, studies relative to fertilizers on pastures were conducted, and at the present time a good permanent pasture field has been established apart from the regular rotation fields.

The live stock program which was in progress at the time of establishment, has gained impetus, keeping pace with the crop improvement work, and a high quality herd of 18 registered Canadian cows is kept, headed by a registered sire. Many of the individual females have qualified in R.O.P. with records of 10,000 pounds and over. In 1934 a silver cup was awarded to a cow in the three-year-old class with a record of 11,500 pounds of milk and 500 pounds of butterfat produced. In 1937 considerable success was attained at the local shows and a silver trophy was won by an individual from this herd in the aged cow class. The station serves as a source of improved stock in the district and since 1934, 22 cattle have been disposed of for breeding purposes. Hogs, sheep, and poultry are kept and considerable income is derived from these subsidiary enterprises.

ST. ATHANASE, KAMOURASKA COUNTY

Operator, Wilfrid Lemieux

This 60-acre farm, half of which is under cultivation, is situated in the newly settled part of Kamouraska county. The soil on this farm is a yellow gravelly loam of medium fertility. Station operations were begun in the spring of 1937 and the farm was measured and divided to conform with a four-year rotation system.

Live stock work on this farm is not extensive as yet, but in 1937 the operator purchased a registered Canadian bull and two registered cows. This initial purchase will be the nucleus for herd improvement work, which will eventually develop a source of improved stock in the district. Twenty-five Barred Rock pullets were purchased in the fall of 1937 and it is proposed to acquire a good Yorkshire sow early in 1938.

RIVIÉRE MAILLOUX, CHARLEVOIX COUNTY

Operator, René Villeneuve

Station work at this point, which is situated 100 miles below Quebec on the north shore of the St. Lawrence river, was begun in the spring of 1937. The farm area comprises 100 acres of tillable land ranging from fertile clay loam on the lower levels to light sand on the hills. The farm has been measured and laid out on a four-year rotation basis.

During 1937 a registered Ayrshire bull was introduced under the federal loan plan. A registered Yorkshire sow was purchased in this same year, marking the initial step in a more extensive hog rearing program. At the present time milk and vegetables, which are disposed of in the small town of La Malbaie, form the main sources of revenue on this farm.

ST. SIMÉON, CHARLEVOIX COUNTY

Operator, Arthur Harvey

The illustration station at St. Simeon is located on the north shore of the St. Lawrence river approximately 120 miles east of Quebec. The soil in this area is low in fertility and decidedly lacking in humus content. Work was commenced at this point in 1932, the initial trials being directed to a study of cultural methods, crop adaptation, and the eventual establishment of a suitable rotation. A four-year roation was established on a small field in 1933, and in 1936 the whole farm was measured and divided to conform with this sequence of crops. Improvement of pastures through fertilization and management was begun in

1935. The results to date have been quite encouraging and indicate that a permanent pasture field is a profitable adjunct to the farm organization.

The live stock program has not as yet received intensive study, but since the inception of station work, daily milk records have been kept and selection is being carried on from a production basis. At the present time the operator has a herd of nine cows of Canadian breeding and headed by a registered Canadian bull. One registered Yorkshire sow is kept and her offspring are disposed of each year. A flock of 25 hens provide eggs for home consumption and any surplus is sold in the immediate district.

GRANDES BERGERONNES, SAGUENAY COUNTY

Operator, Elzear Simard

The farm comprises an area of 175 acres of tillable land, 135 acres being fertile loam and the remaining 40 acres grading to a sand loam. Illustration work began at this point in 1934 and in 1935 a four-year rotation consisting of hoed crops, Cartier oats, clover hay, and mixed hay, was established.

The live stock kept on the farm consists of 13 grade cows, five heifers, one Yorkshire Advanced Registry boar and a Yorkshire sow, eight sheep, and 50 Barred Rock hens. The registered hogs were purchased from the experimental station at Ste. Anne de la Pocatiere in 1937, with the idea in mind of building up a high quality herd. Individual production records are kept on the dairy herd and a program of selection on this basis and the use of a registered sire, is expected to give very satisfactory results.

ST. ELEUTHERE, KAMOURASKA COUNTY

Operator, Damase Dumont

Illustration station operations were commenced in 1932 on this farm which is situated southeast of Ste. Anne de la Pocatiere, near the New Brunswick border. Early station work was directed to rotational studies, a four-year crop sequence being adopted as suitable to local conditions, and in 1935 the whole farm was organized on this basis.

Live stock improvement work had its inception in 1933 through the introduction of a registered Ayshire sire, individual records of milk production, and approved methods of feeding and management. Hogs have a place of major importance on this farm, a herd of Yorkshires headed by an Advanced Registry boar, being kept. A profitable poultry enterprise has been established on the farm and in 1935 a modern insulated henhouse and brooder house was built. A good flock of Barred Rock hens adds markedly to the farm revenue.

ST. ARSENE, TEMISCOUATA COUNTY

Operator, Antonio Caillouette

The year 1937 marks the first year of illustration station work on this farm which is situated ten miles from Riviere du Loup, a town of 8,000 population. The farm comprises a tillable area of 100 acres of which 40 acres is relatively light sand, the remainder being rich clay loam. This variability in soil type has allowed for the establishment of two rotations; one of three-year duration consisting of potatoes, grain seeded to grasses and clovers, and one year in hay; the other a four-year rotation which is designed to furnish the necessary home-grown feeds for the live stock kept. In addition to rotational studies, a definite pasture improvement program has been laid out and 15 acres of land reserved for this project. It is proposed to fertilize and improve five acres each year and to maintain the area as a permanent pasture. The initial fertilizer applications were made in 1937.

At present the operator maintains a herd consisting of 13 registered Ayrshire females and three grades. The herd is headed by a registered Ayrshire sire and selection work is governed by individual records as well as conformation. Hogs are kept but have not assumed a place of any great importance as yet. A small flock of registered Leicester sheep adds to the general farm income. A good flock of Barred Rock hens is a profitable enterprise. This flock is subjected to the pullorum test each year, with the idea in mind of establishing a source of disease-free chicks and hatching eggs in the district.

LUCEVILLE, RIMOUSKI COUNTY

Operator, Jos. Belanger

This 100-acre farm is situated in what is known as a potato district, about 15 miles below Rimouski near the town of Luceville on the Canadian National Railway line to the Maritimes. The illustration station was established in 1933 and since that time the farm has been measured and two separate rotations are established. A three-year potato rotation has been laid out on an 18-acre area which is particularly suited to this crop, and the remainder of the farm has been divided to conform with a four-year cropping sequence, the final measurements and arrangement being effected in 1935. A permanent pasture program has been progressively developed on this farm and at the present time there is a total area of 12 acres of improved pasture apart from the rotation fields.

The cattle improvement policy has been based on the introduction of Canadian blood, replacing a low-quality herd sire with one of this breeding. The live stock kept on the farm consists of 15 grade cows, two sows of good type, three horses and 25 hens. The buildings and surroundings have been made more comfortable and sanitary to conform with a constructive policy of care, breeding, feeding, and management of the live stock.

STE. ANGELE DE RIMOUSKI, RIMOUSKI COUNTY

Operator, Rene Langlais

The farm comprises an area of 150 acres of tillable land ranging from gray fertile loam to poor gravelly upland soil. A four-year rotation laid out in 1928 on a trial area has been extended and in 1934 the whole farm was measured and brought under this cropping system. A constructive plan of pasture improvement has been mapped out on this station and a ten-acre area was fertilized in 1937.

Dairy cattle, hogs, sheep, and poultry combine to form a profitable farm enterprise. A herd of 28 grade Ayrshires headed by a registered sire is the most important unit in the live stock organization. Individual records are kept and selection work carried on from this basis. Three registered Yorkshire sows, one boar of the same breed, 15 grade Oxford sheep, and 130 Barred Rock hens complete this unit of the farm business. The poultry program had its inception in 1937, when improvements to brooding and housing equipment were made and 300 chicks purchased in the spring. Advanced registry work with hogs is under consideration at this station and the progress made to date augurs well for this venture.

SAYABEC, MATAPEDIA COUNTY

Operator, J. A. Belanger

Crop improvement programs, remodelling and renewing of farm buildings, as well as a definite live stock policy, have been projects of major importance on this farm since the inception of illustration station activities in 1930. The farm comprises 190 acres of land of which 90 acres are tillable, the remainder being bush and partly cleared areas. The old cropping system has been discarded and the farm measured and divided to conform with a four-year cropping

sequence. Permanent pasture is provided for outside of the rotation fields. The old barn was demolished in 1930 and a modern structure erected to more suitably house the live stock. The henhouse and piggery were remodelled in this same year and a marked improvement in the surroundings was effected by this work.

The dairy heard of Ayrshire breeding is composed of 18 females, 13 of which are registered, and a registered Ayrshire sire. Swine breeding has gathered considerable momentum since 1934 when Advanced Registry Yorkshire stock was introduced from the experimental station at Ste. Anne de la Pocatiere. A flock of 80 hens is kept and considerable revenue is derived from this enterprise.

CAUSAPSCAL, MATAPEDIA COUNTY

Operator, Jos. Valois

This station is situated in the Matapedia valley, 250 miles east of Quebec City. The soil on this 140-acre high-land farm could be classed as being medium to low in fertility and containing a relatively low percentage humus. The initial study project was the establishment in 1929, of a four-year rotation with the purpose in mind of raising the fertility level, as well as providing the proper balance of home-grown feed for the live stock. Applications of chemical fertilizers have not always given distinctly positive results, except where applied to the permanent pasture when the carrying capacity of the treated area almost tripled that recorded on the check plot.

Live stock improvement work has been carried on since 1929 through the use of a good registered Ayrshire sire, and selection of the females based on their individual production records. At the present time the dairy herd comprises 14 cows, five of which are registered, and a registered bull. A registered Yorkshire boar, three Yorkshire sows, eight grade sheep, and 35 Barred Rock hens, combine to round out the agricultural unit, and assure a relatively constant income throughout the year.

NOUVELLE, BONAVENTURE COUNTY

Operator, Leon Lavoie

Station work was begun on this farm in 1927. The soil is typical of the district, ranging from a fertile loam to poor gravelly upland. The primary project on this station was a study of the fertility needs of the soil, and the eventual establishment of a rotation which would provide a suitable balance of crops to feed the live stock kept. The four-year rotation system, which was first laid out on a trial area in 1928, has been extended and in 1934 the whole farm was brought under this system. Permanent pasture has been provided for outside of the rotation fields, the initial improvement work being done in 1936 when five acres were seeded with a suitable pasture mixture and fertilized.

Live stock improvement began in 1929 with the keeping of individual records on the dairy herd and weeding out the low producers. In 1932 a registered Ayrshire bull was purchased and since that year a high class sire has been maintained at the head of the herd. Hogs form a profitable adjunct to the farm organization and the operator keeps three brood sows the year round, the revenue from this enterprise contributing markedly to the farm income. The poultry project has not assumed any great importance as yet but plans for the expansion of this department are under way for 1938.

MARIA, BONAVENTURE COUNTY

Operator, Adhemar Cyr

Station operations were commenced on this farm in 1932. Geographically the farm is situated on the north shore of Chaleur bay, 375 miles east of Quebec City. Preliminary observations of the topography and soil types indicated the

need of a constructive drainage scheme and soil management program. A four-year rotation has been established and turnips, grain, clover, and timothy hay, are doing very well on what was formerly distinctly marginal land.

Live stock work has not as yet attained any great importance on this farm, being secondary to the crop improvement program. However, milk records are kept, and in 1937 a registered Ayrshire bull was purchased by the operator. A permanent pasture area has been laid out, a two-acre field being limed, fertilized, and seeded in 1937 in order to provide a source of highly nutritive forage throughout the duration of the grazing season.

The poultry house was remodelled in 1937 and the extension of this branch of the farm organization is contemplated in 1938.

STE. ANNE DES MONTS, GASPÉ COUNTY

Operator, Octave Deschêne

This 90-acre farm is situated 335 miles east of Quebec on the north shore of the Gaspé peninsula. Station work was begun in 1930, the initial program being the establishment of a four-year rotation on a 20-acre field. In 1934 this rotation system was extended to the whole farm, and an area was set aside for permanent pasture. In addition to rotational studies, a systematic drainage program has been a project of great interest and value. The uneven topography of the farm with the incidence of a great many low wet spots has emphasized the need for this work, and under-drainage has been resorted to, supplementing a system of open ditches. This program has increased the agricultural value of the land and facilitates the cultivation of crops which formerly could not be grown.

The dairy herd of nine grade Ayrshire cows is on a daily record system. The produce from the herd is retailed in the nearby town of Ste. Anne. A registered Ayrshire sire is kept and grading up is practised by raising heifers from the higher-producing dams. A registered Yorkshire boar and two sows of the same breeding form an enterprise which adds to the general farm income. A small flock of eight sheep is kept, as well as a flock of 30 Barred Rock hens.

Improvements to the farm buildings have been constant since the inception of illustration station work. A new poultry house was constructed in 1937 in addition to other improvements which have been made to the farm and home surroundings.

Yield and Cost of Production Studies

As in the past and from 1934-1937 inclusive, the cost of production has been determined for all field crops grown on each of the illustration stations. This information has been found of value to farmers as a check on the efficiency of their cultural practices. On this basis it is possible to determine which crops can be grown most economically in the different farming localities of the province. To arrive at these costs, information is assembled as to the horse and manual labour, seed, charges for machinery, manure, fertilizer, etc., which is required to grow each crop. From these data and the yield obtained, the cost per unit is calculated. All labour costs are based on prevailing rates for the district and all labour which the operator, his family and team do on a particular crop, is charged against it at local prevailing rates. Thus when considering these costs it will be apparent that the farm owner received compensation for his labour and that of his family during the period of crop production.

The following table lists the yield and cost of producing the five most important crops being grown at the different stations, namely, corn, turnips, oats, clover and timothy hay. In addition to the yields for 1937, long-period crop data with respect to yields, cost of production per unit and per acre are also given.

Station	Corn					Turnips				
	Number of years grown	Average			Yield per acre 1937	Number of years grown	Average			Yield per acre 1937
		Yield per acre	Cost per ton	Cost per acre			Yield per acre	Cost per ton	Cost per acre	
		ton	$ cts.	$ cts.	ton		ton	$ cts.	$ cts.	ton
L'Annonciation	12	8·08	3 82	30 86	8·38	12	5·59	5 46	30 52	4·75
Joliette	14	11·69	2 96	34 60	13·45	12	21·87	1 41	30 84	24·58
St. Etienne des Grès	17	f3·02	1 72	22 39	14·60	17	16·62	1 88	31 24	21·28
St. Hermas	1	13·86	1 82	25 22	13·86	1	28·08	0 92	25 83	28·08
St. Jérôme	17	14·83	1 89	28 03	13·49	17	20·54	1 90	39 02	15·87
St. Constant	10	14·09	1 98	27 90	22·82	8	16·65	3 16	52 61	9·75
L'Acadie	1	12·46	1 82	22 68	12·46	1	16·24	2 37	38 49	16·24
St. Simon de Bagot	17	17·22	1 75	30 14	20·57	17	20·06	1 69	33 90	17·24
South Roxton	5	10·68	2 91	31 08	.....	9	26·60	1 75	46 55	25·00
Plessisville	18	15·60	2 41	37 60	10·86	9	29·40	1 45	42 63	32·00
Laurierville	5	12·76	2 24	28 58	14·10	6	29·70	1 63	48 41	38·66
Lotbinière	.....	.....	.....	.....	.....	6	21·21	1 73	36 69	20·00
St. Apollinaire	.....	.....	.....	.....	.....	7	29·59	1 42	42 02	12·50
Pintendre	.....	.....	.....	.....	.....	3	13·68	2 58	35 29	10·60
Scott Junction	.....	.....	.....	.....	.....	9	24·16	2 44	58 95	15·52
Honfleur	2	8·75	3 69	32 29	5·00	3	16·52	2 35	38 82	12·00
Ruisseau à l'Eau Chaude	.....	.....	.....	.....	.....	6	18·27	2 06	37 64	15·07
St. Prosper de Dorchester	.....	.....	.....	.....	.....	5	18·22	2 24	40 81	21·40
St. Evariste de Forsyth	.....	.....	.....	.....	.....	6	26·58	1 52	40 40	24·00
St. Pierre d'Orléans	.....	.....	.....	.....	.....	10	16·50	2 42	39 93	15·00
St. Vaüer	.....	.....	.....	.....	.....	8	16·39	2·07	33 93	31·00
St. Camille de Bellechasse	.....	.....	.....	.....	.....	5	16·50	3 30	54 45	15·00
L'Islet	.....	.....	.....	.....	.....	8	27·39	1 49	40 81	25·00
St. Siméon	.....	.....	.....	.....	.....	5	22·00	2 14	47 08	25·00
St. Eleuthère	.....	.....	.....	.....	.....	7	18·87	2 10	39 63	15·00
Luceville	.....	.....	.....	.....	.....	6	19·70	2 35	46 30	22·00
St. Angèle de Rimouski	.....	.....	.....	.....	.....	6	16·58	2 62	43 44	14·80
Sayabec	.....	.....	.....	.....	.....	9	18·50	2 55	47 18	25·00
Causapscal	.....	.....	.....	.....	.....	10	18·50	2 18	40 33	19·50
Nouvelle	.....	.....	.....	.....	.....	11	16·60	2 32	38 51	15·00
Maria	.....	.....	.....	.....	.....	4	21·57	1 98	42 71	25·00
Ste. Anne des Monts	.....	.....	.....	.....	.....	8	17·20	2 37	40 76	22·00
Average	.....	12·75	2 42	29 28	13·60	.....	20·18	2 18	40 80	19·81

ON ILLUSTRATION STATIONS IN QUEBEC

Oats					Clover hay					Timothy hay				
Number of years grown	Average			Yield per acre 1937	Number of years grown	Average			Yield per acre 1937	Number of years grown	Average			Yield per acre 1937
	Yield per acre	Cost per bushel	Cost per acre			Yield per acre	Cost per ton	Cost per acre			Yield per acre	Cost per ton	Cost per acre	
	bush.	$ cts.	$ cts.	bush.		ton	$ cts.	$ cts.	ton		ton	$ cts.	$ cts.	ton
9	23·0	0 69	15 87	.....	10	0·52	25 51	13 26	0·28	9	0·48	21 07	10 11	0·32
14	32·2	0 46	14 81	9·0	4	2·42	6 26	15 15	2·37	11	1·65	8 04	13 27	1·88
17	25·5	0 54	13 77	16·0	15	1·07	10 09	10 80	0·60	16	1·28	6 65	8 51	1·00
1	20·0	0 64	12 80	20·0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
16	41·2	0 49	20 19	15·0	12	1·94	8 60	16 68	2·80	14	1·38	9 37	12 93	1·60
16	42·0	0 32	13 65	28·0	7	1·53	7 84	12 00	0·69	13	1·72	6 20	10 66	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
9	43·2	0 48	20 74	18·0	1	2·99	5 09	15 22	.....	12	1·80	7 33	13 19	1·50
10	41·3	0 48	19 80	40·0	7	2·98	5 33	15 88	.....	2	3·14	3 05	9 58	3·25
9	64·5	0 32	20 64	56·7	18	2·05	8 49	17 40	3·25	.....	.....	.....	.....	.....
9	56·5	0 34	19 21	34·8	1	2·22	5 55	12 32	2·22	6	1·51	7 71	11 64	2·06
5	34·5	.....	.....	61·3	5	2·37	5 60	13 27	2·00	6	2·42	4 86	11 76	3·20
6	39·3	0 46	18 08	32·0	3	2·50	4 81	12 02	1·90	11	1·66	7 40	12 28	.....
2	25·1	0 70	17 57	.....	2	2·41	6 53	15 74	1·34	1	1·25	7 89	9 86	1·25
14	33·8	0 60	20 27	36·0	4	1·27	9 71	12 33	1·69	10	1·31	9 32	12 21	1·41
2	35·1	0 67	23 48	22·0	2	3·32	3 39	11 25	3·60	1	2·48	3 32	8 23	2·48
3	40·1	0 43	17 24	37·6	5	2·06	6 86	14 13	1·64	6	1·31	8 64	11 32	1·18
5	42·4	0 41	17 38	47·2	4	2·01	5 56	11 18	2·01	3	1·60	6 54	10 46	1·79
6	49·2	0 36	17 72	45·0	4	2·16	5 06	10 93	2·25	10	1·50	9 31	13 96	1·75
7	32·0	0 75	24 00	30·0	8	1·46	10 03	14 64	1·50	7	1·80	6 74	12 13	2·00
.....	.....	.....	.....	.....	8	3·82	4 96	18 95	2·90	8	2·89	5 33	15 40	3·00
4	47·0	0 42	19 74	45·0	6	1·33	9 17	12 20	1·50	6	1·32	8 22	10 85	1·00
8	59·0	0 34	20 06	44·0	8	2·37	6 90	16 35	2·40	7	2·55	5 11	13 03	2·30
4	38·0	0 52	19 76	35·0	5	1·50	9 55	14 32	1·50	4	1·15	8 54	9 82	1·30
7	40·0	0 55	22 00	30·0	5	1·42	8 99	12 76	1·50	4	1·43	6 75	9 65	1·50
.....	.....	.....	.....	.....	4	2·50	6 32	15 80	2·50	4	2·00	5 66	11 32	2·00
.....	.....	.....	.....	.....	6	2·70	6 50	17 55	3·00	7	2·71	5 08	13 77	3·00
.....	.....	.....	.....	.....	6	2·53	6 24	15 79	2·20	6	2·25	5 14	11 56	2·50
11	45·0	0 52	23 40	37·0	9	1·85	7 68	14 21	2·00	9	2·05	5 64	11 56	2·20
11	43·0	0 52	22 36	35·0	13	2·63	5 49	14 44	3·50	8	1·48	6 92	10 24	1·50
.....	.....	.....	.....	.....	5	2·63	7 11	18 70	1·50	4	1·25	10 38	12 98	1·00
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	1·66	5 58	9 26	2·00
.....	39·7	0 50	18 94	33·7	.....	2·16	7 56	14 32	2·02	.....	1·76	7 30	11 43	1·85

It will be noted from a review of the accompanying table that the average yield of corn per acre was 12·75 tons, and the cost of production $2.42 per ton or $29.28 per acre, also that the production of the crop is confined principally to the southwestern section of the province. It is obvious that yield is the primary factor affecting the cost of growing the crop. This will be noted from the fact that at L'Annonciation, with a yield of 8·08 tons, the cost of production was increased to $3.82 per ton. The average yield of corn in 1937 was 13·60 tons. The average yield of turnips was 20·18 tons, the cost of production being $2.18 per ton or $40.80 per acre. Oats were produced at an average cost of $0.50 per bushel, when the average yield was 39·7 bushels. Clover hay yielded 2·16 tons per acre, costing $7.56 per ton or $14.32 per acre. The cost of producing timothy hay was $11.43 per acre, the yield 1·76 tons, and the cost of production per ton $7.30.

COST OF POTATO PRODUCTION

On the stations in Quebec potatoes are generally grown and are an important cash crop. They are grown following sod or grass land in a crop rotation of from four to six years' duration. In the following table the different items of cost are summarized under use of land and taxes, manure and fertilizer, labour, including horse and manual, seed, use of machinery.

Station and District	1937		Itemized statement of cost per acre					Average			
	Yield per acre (bushels)	Cost per bushel	Use of land and taxes	Manure and fertilizer	Labour	Seed	Machinery	Number of years grown	Yield per acre (bushels)	Cost per bushel	Cost per acre
		$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.			$ cts.	$ cts.
WESTERN QUEBEC DISTRICT											
L'Annonciation	100	0 58	1 84	11 85	33 17	8 00	2 85	11	130	0 39	50 70
St. Etienne des Grès	119	0 28	1 31	11 85	15 89	8 00	2 85	18	265	0 15	39 75
St. Hermas	67	0 53	1 26	8 82	15 52	7 50	2 85	1	67	0 53	35 51
St. Jérôme	172	0 21	4 47	8 70	10 18	9 25	2 85	14	264	0 21	55 44
St. Constant	108	0 35	2 79	8 82	15 56	7 50	2 85	3	65	0 61	39 65
L'Acadie	136	0 25	0 97	8 82	14 15	7 50	2 85	1	136	0 25	34 00
St. Simon de Bagot	150	0 24	3 01	3 00	17 15	7 50	2 85	2	165	0 21	34 65
CENTRAL QUEBEC DISTRICT											
Plessisville	252	0 15	4 90	9 30	11 64	9 00	2 85	2	176	0 26	45 76
Laurierville	325	0 12	2 48	10 02	16 18	9 00	2 85	6	324	0 14	45 29
Lotbinière	120	0 36	2 99	10 02	18 71	9 00	2 85	1	120	0 36	43 20
St. Apollinaire	66	0 51	3 21	10 02	8 68	9 00	2 85	2	188	0 31	59 38
Scott Junction	528	0 10	2 12	9 30	30 69	9 00	2 85	6	480	0 12	55 65
Honfleur	240	0 16	1 60	10 02	15 14	9 00	2 85	3	218	0 22	48 03
Ruisseau à l'Eau Chaude	186	0 20	1 90	10 02	13 76	9 00	2 85	6	202	0 21	42 38
St. Prosper de Dorchester	185	0 19	1 63	10 02	11 04	9 00	2 85	4	191	0 28	53 62
St. Evariste de Forsyth	210	0 19	2 15	10 02	15 84	9 00	2 85	6	276	0 17	46 85
Average 16 stations	185	0 28	2 41	9 60	16 46	8 52	2 85	.....	204	0 28	45 62

The average cost of growing and harvesting potatoes, not including marketing, was $45.62 per acre, or 28 cents per bushel for table stock when the average yield was 204 bushels per acre. The different items of expense listed according to their importance were: labour $16.46, manure and chemical fertilizer $9.60, seed $8.52, use of machinery $2.85, use of land and taxes $2.41. At Scott Junction the cost of production was reduced to $0.12 per bushel due to the relatively high yield obtained, namely 480 bushels.

Soil Fertility Tests

On many of the farms operating as illustration stations, the supply of farmyard manure is inadequate to provide the necessary plant food for maximum growth of farm crops, thus soil fertility is a major problem. For several years the supplementary value of artificial manures or chemical fertilizer, associated with the production of legumes, drainage and general crop management, has been under study in an effort to ascertain the most economical fertilizing practice which farmers in the different districts might employ. Space will not permit a complete enumeration of the tests and results obtained on the 52 stations in Quebec, but these results are available for those interested and experiencing similar practical soil fertility problems.

Response of Swede Turnips to Different Manurial, Lime, and Fertilizer Treatment

In 1934 tests of manure, chemical fertilizer and lime were laid down on the Quebec stations, to study their respective effects on succulent crops, particularly turnips, corn and potatoes. The response has been somewhat variable, resulting to a degree from differences in soil type, natural fertility, drainage and soil management. Thus soil fertility studies have quite a local application. The manure was applied in the spring and disked in, the chemical fertilizer and lime were broadcast and harrowed in before planting. The treatment in the test under consideration compared manure alone at a rate of 16 tons, the same application of manure supplemented with lime and superphosphate, also manure at 8 tons per acre associated with lime and chemical fertilizers compounded on the basis of a 2-12-6 and 4-8-10 formula. In all cases it will be noted that the available phosphorus in the different treatments where superphosphate occurred singly or in the mixture, was balanced, 48 pounds of available phosphorus being supplied in each case. The response as measured by turnip yields resulting from the different treatments during the three-year period 1934-37 is indicated in the table below.

TURNIP YIELDS—RESPONSE FROM DIFFERENT MANURIAL, LIME AND FERTILIZER TREATMENTS PER ACRE

Station		Manure 16 tons	Manure 16 tons Lime 2 tons	Manure 16 tons Lime 2 tons Superphosphate—300 lb.	Manure 8 tons Lime 2 tons 2-12-6 400 lb.	Manure 8 tons Lime 2 tons 4-8-10 600 lb.
		ton	ton	ton	ton	ton
South Roxton	(1934)	30·14	30·80	31·46	32·39	33·44
	(1935)	21·61	21·61	26·46	28·98	31·24
	(1936)	14·74	14·74	18·26	21·23	23·76
3-year—Average		22·16	22·38	25·36	27·87	29·48
Laurierville	(1934)	34·07	32·69	31·10	37·70	35·28
	(1935)	25·98	26·02	28·71	29·16	30·15
	(1936)	30·85	33·18	34·68	33·84	37·31
3-year—Average		30·30	30·63	31·50	33·57	34·25
St. Apollinaire	(1934)	29·54	29·97	34·10	35·20	37·10
	(1935)	22·00	29·60	33·00	35·20	35·20
	(1936)	24·00	27·00	31·00	34·00	35·00
3-year—Average		25·18	28·86	32·70	34·80	35·77
Ruisseau à l'Eau Chaude	(1934)	11·55	15·01	15·67	12·71	14·91
	(1935)	21·45	18·15	19·80	20·90	20·90
	(1936)	16·20	16·20	20·28	20·30	21·28
3-year—Average		16·40	16·45	18·58	17·97	19·03
St. Evariste de Forsyth	(1934)	22·80	22·80	23·50	17·80	24·30
	(1935)	30·69	24·75	32·34	29·85	23·10
	(1936)	.....	16·50	28·80	29·50	31·20
3-year—Average		26·24	21·85	28·21	25·72	26·20
3-year average of 5 stations.		24·06	23·94	27·27	28·55	28·95

The most interesting practical results accruing from this work may be observed from the treatments where manure at 8 tons per acre was applied with lime and 2-12-6 and 4-8-10 fertilizers. Here the most consistent increased yield of turnips was obtained, indicating the feasibility of stimulating crop growth, on farms where the supply of manure is limited, by supplementing it with a dressing of a suitably balanced chemical fertilizer. From the five stations under review, manure alone at 16 tons gave a turnip yield of 24·06 tons, whereas manure at 8 tons along with chemical fertilizers gave yields of 28·55 and 28·95 tons respectively.

At Plessisville and Scott Junction, similar tests were carried out with the exception that ground limestone was not included in the manure or fertilizer combinations. In these two tests 16 tons of manure gave an average yield of 24·13 tons, 16 tons of manure and 300 pounds of superphosphate 29·06 tons, 8 tons of manure and 400 pounds of 2-12-6 fertilizer 27·68 tons, and 8 tons manure and 600 pounds 4-8-10 fertilizer 30·02 tons. It will be observed that an increase of 3·21 tons of turnips per acre was obtained from the area where manure was supplemented with an application of 300 pounds of superphosphate 20 per cent, over the area where manure was used alone. Increases of 4·49 and 4·89 tons of turnips per acre were obtained from the application of 400 pounds of 2-12-6 fertilizer and 600 pounds of 4-8-10 fertilizer, used in each case along with 8 tons of manure, over the check area which received a standard treatment of 16 tons of manure.

Manure Compared with Manure and Fertilizer at Different Rates for Potatoes

Being a heavy feeder, the potato crop requires an abundant supply of plant food. This must be supplied from the soil reserves or through the application of manure or chemical fertilizer. On the stations in Quebec, the land for potatoes is fall ploughed out of sod, the decomposed clover and timothy sod associated with thorough seed bed preparation promotes favourable conditions for potato growing. In the fertility studies carried out on nine stations, manure at the rate of 16 tons was compared with manure and superphosphate, manure 8 tons plus 400 pounds of 2-12-6 fertilizer, also manure 8 tons with 600 pounds fertilizer of a 4-8-10 formula. The manure was applied in the spring and disked in. Where potato planters were available, the fertilizer was drilled in at planting time, otherwise it was broadcast before planting.

The following table gives the three-year average yield of potatoes for the period 1934-36, inclusive.

POTATO YIELD—MANURE ALONE *vs.* MANURE SUPPLEMENTED WITH COMMERCIAL FERTILIZER—AVERAGE 1934-35-36 RESULTS PER ACRE

Station	Manure 16 tons	Manure 16 tons Super. 300 lb.	Manure 8 tons 2–12–6, 400 lb.	Manure 8 tons 4–8–10, 600 lb.
	bush.	bush.	bush.	bush.
Campbell's Bay	259·5	299·0	308·0	263·0
L'Annonciation	114·3	164·3	158·3	159·3
St. Etienne des Grès	272·0	269·3	258·3	228·0
St. Jérôme	195·3	279·7	205·7	246·3
St. Pierre d'Orléans	215·0	239·0	275·0	306·0
St. Camille de Bellechasse	201·0	227·0	214·0	208·0
Luceville	184·0	232·0	173·0	241·0
Ste. Angèle de Rimouski	202·0	247·0	256·0	268·0
Causapscal	257·0	298·0	293·0	260·0
Average 9 stations	211·1	250·6	237·9	242·2

The three-year average yield of potatoes from the nine stations was 211·1 bushels per acre on the area treated with 16 tons of manure. Where a similar amount of manure was supplemented with 300 pounds of superphosphate, a 39·5 bushel increase was obtained. On the area manured at the rate of 8 tons per acre and supplemented respectively with 400 pounds of complete fertilizer of a 2-12-6 and 600 pounds of a 4-8-10 formula, the yield was increased by 26·8 and 31·1 bushels per acre.

In 1937 a fertilizer test was conducted on 12 stations in the eastern Quebec district of supervision. Two treatments were compared, namely the use of manure alone at 16 tons and manure 8 tons with 400 pounds 2-12-6 fertilizer. The resulting yields were 163 bushels and 218 bushels per acre respectively. The 55 bushel increased yield obtained from the combined manure and fertilizer treatments cost $10.10. Other fertilizer trials have been conducted on corn, oats, peas and vetch with similar trends. This work generally indicates the practical possibility of increasing crop yields where the supply of farmyard manure is limited, by making light applications to a larger crop acreage than otherwise would be possible, then supplementing the manurial applications with well-balanced chemical fertilizers where the phosphorous content is relatively high such as that of a 2-12-6 or 4-8-10 formula to offset the usual phosphorous deficiency in manure.

The Value of Lime

In many agricultural districts soil acidity is a limiting factor in the successful production of clover and alfalfa. When seeding down land to hay, the mixture of eight pounds of timothy, five pounds of red clover, two pounds

of alsike, and five pounds of alfalfa is found to have a wide adaptation on farms operating as illustration stations. Where soils are acid and the necessary drainage is not provided, the proportion of alfalfa should be reduced due to the unlikelihood of its succeeding. In 1934, tests were started on seven stations in eastern Quebec, namely at St. Vallier, Maria, St. Simeon, St. Camille, Nouvelle, L'Islet and Causapscal, to study the response of clover to applications of ground limestone. The four-year average yield on the unlimed check area was 1·6 tons in comparison with 2·09 tons where two tons of ground limestone had been applied when the land was being seeded down the previous year. The average increased yield of clover hay for the four-year period obtained at the nine points named amounted to 1,540 pounds per acre.

The Control of Brown-heart in Swede Turnips

Swede turnips are grown generally on the illustration stations in Quebec, as fall and winter feed for cattle, brood sows, growing hogs, and poultry. In districts adjoining the larger towns and industrial centres they are in demand for table use, thus providing an added source of revenue. As labour represents a large proportion of the cost of growing turnips, varying from approximately $10 to $30 per acre, it has been found advantageous to thoroughly prepare, manure and fertilize land intended for turnips, aiming to produce a 20- to 25-ton crop.

Within recent years turnip growers have experienced difficulty from a disorder known as brown-heart, which has adversely affected the keeping and table qualities. The effect of boron in controlling this physiological disorder is being studied on the stations as a supplementary test to experimental work being conducted on the experimental farms.

In a test carried out on 14 stations in eastern Quebec, rates of 10 and 15 pounds of borax were compared with an untreated area. The borax was broadcast before planting. The results for the years 1934-35 have been averaged. The 1936 results from a 15-pound borax application are indicated in the table given below:

BROWN-HEART CONTROL OF TURNIPS WITH BORAX

Stations	1936						Average 1934-35					
	15 lb. borax per acre			Without borax			10 lb. borax per acre			Without borax		
	Free	Trace	Severe	Free	Trace	Severe	Free	Trace	Severe	Free	Trace	Severe
	%	%	%	%	%	%	%	%	%	%	%	%
St. Vallier							80	20		50	45	5
Luceville	100			75	15	10						
St. Lazare							87	3	10	10	30	60
Ste Anne des Monts	100			80	20							
St. Eleuthère	95	5		75	20	5						
Montmagny	100			70	30		100			50	50	
St. Paul de Montminy	70	30			40	60						
St. Hilarion	100			60	25	15	40	50	10	10	10	80
St. Camille	80	20		55	10	35	95	5		60	30	10
Ste. Angèle							75	15	10	50	20	30
Nouvelle							95	5		95	5	
L'Islet	80	20		40	20	40	100			80	15	5
St. Pierre d'Orléans	98	2			10	90	50	50		10	40	50
Causapscal	100			85	15		90	10		90	10	
Average	92	8		54	20	26	81	16	3	50	26	24

It will be noted from the results obtained that with the ten-pound application of borax, 81 per cent of the turnips were free from brown-heart, 16 per cent showed a trace, and 3 per cent were badly infected. Where no borax

was applied, only 50 per cent were free, 26 per cent showed a trace, and 24 per cent were bady infected. In the 1936 test, where the rate of applying borax was increased to 15 pounds per acre, 92 per cent were found to be free of brown-heart, 8 per cent showed a trace, with none showing a severe infection, in comparison with 54 per cent free, 20 per cent showing a trace, and 26 per cent badly affected where no borax was applied.

Pasture Improvement

In 1934, the improvement of permanent pasture land was established as an active station project. The plan employed included liming, fertilizing and re-seeding certain specified test areas. Lime was used in the form of ground limestone at the rate of two tons per acre supplemented on heavy soils by 500 pounds superphosphate 20 per cent, and on light soils by 600 pounds of a 0-16-6 chemical fertilizer. This system of fertilizing and associated necessary pasture management has proved to be highly efficient on the station farms in promoting grass and clover coverage, in the control of competitive plants and in raising the live stock carrying capacity. It is worthy of mention that on these eastern Quebec stations, lime seems to be a vital factor for success in pasture improvement work.

The following table gives the average results for the four-year period 1934-37 on the stations named in the eastern Quebec district of supervision. The grazing capacity is computed on the basis of a 122-day grazing period.

RESULTS WITH PASTURE FERTILIZATION

Stations	Grazing days per acre		Carrying capacity per acre		Increase of milk per acre due to improvement by fertilizer
	Fertilized	Without fertilizer	Fertilized	Without fertilizer	
	day	day	cow	cow	lb.
St. Vallier	142	89	1·16	0·73	1,552
Sayabec	157	75	1·29	0·62	2,519
L'Islet	200	104	1·64	0·86	2,643
Luceville	141	59	1·15	0·49	1,880
St. Pierre d'Orléans	135	42	1·11	0·35	1,591
Causapscal	89	20	0·73	0·16	2,587
St. Siméon	100	30	0·82	0·25	.....
Average	138	60	1·13	0·49	1,824

It will be noted that the period of grazing was increased from 60 days on the unimproved to 138 on the improved and fertilized land. Where fertilizers were applied, the carrying capacity per acre was increased from 0·49 to 1·13 animal units. This increase of 130 per cent in carrying capacity for the improved pasture is of considerable importance where there is a shortage of pasturage and where more intensive farming is economically essential.

Corn Growing

Corn growing commands an important place in the cropping program on farms operating as illustration stations in the southwestern section of the province. Here it is advantageously used as fall feed, supplementing pasturage at a time of the year when grass growth is frequently inadequate for the herds, and as a succulent crop for winter feeding, either as silage or stover. On the stations, land infested with couch grass is summer-fallowed out of sod, rolled, frequently cultivated, preferably on hot sunny days. In the case of clay land,

it is again ploughed in the fall before the freeze-up. On sand and sandy loam soils the fall ploughing operation is omitted. When perennial weeds are not present, fall ploughing alone has been found a desirable practice, especially on clay soils. On loam and sandy loam soils spring ploughing has been found to produce good corn yields, although increasing the amount of horse and manual labour at a rush season of the year. If available, 16 tons of manure is disked into the soil in the spring, otherwise a light application of manure supplemented with a 2-12-6 or 4-8-10 chemical fertilizer is used. Early Leaming, Wisconsin No. 7, and Longfellow are favoured by the operators as varieties well suited to their districts. Approximately 45 pounds of seed, having a high germination, is planted in rows 36 inches apart. Before the corn is up, and until five inches high, the land is harrowed crosswise and lengthwise alternately to control weed growth. Further necessary cultivation is performed with a single or two-row cultivator.

From the table showing the yield and cost of growing crops, it will be noted that the average yield of corn obtained in 1937 from the 12 stations concerned, was 13·60 tons per acre in comparison with a 12·75-ton per acre average. The period of years covered by these averages varies because of certain stations being more recently established than others. From tests conducted on the stations at Campbell's Bay, St. Etienne des Gres, and St. Jerome, the application of 300 pounds of superphosphate to land manured at 16 tons per acre increased the three-year average yield from 13·91 to 14·74 tons per acre. Manure at 8 tons along with 400 pounds of a 2-12-6 fertilizer gave a yield of 14·97 tons. An 8-ton application of manure and 600 pounds of 4-8-10 fertilizer yielded 15·6 tons per acre. It may be concluded from this test that corn responds favourably to supplementary dressings of fertilizers strong in nitrogen and phosphorus.

Variability of Revenue Derived from the Sale of Milk

From a farm management standpoint a steady monthly income is very desirable. With this in view a study is being made of the farm revenue taken in from the different departments. In the graph on the next page three types of dairy farm organizations are illustrated with respect to the revenue derived from the sale of milk. These three farms have approximately the same area, namely 100 acres of tillable land.

A dairy herd of 18 cows was kept on farm No. 1 in 1937, giving a total income of $1,980.11 for the year, or an average monthly income of $165.01. As shown in the graph, the highest monthly revenue, $207.49, was obtained in November, while the lowest, $133.53 was in August. Farm No. 2, with a herd of 23 cows produced an income of $787.24 from the sale of milk. The lowest monthly revenue was $21.70 in January, and the highest, $176.26, in July. It is obvious from the line indicating income from milk on farm No. 3, that the dairy production is not well organized. The ten cows kept during 1937 gave an income of only $250 for the year. During three months, namely,—January, February, and March, no milk was sold.

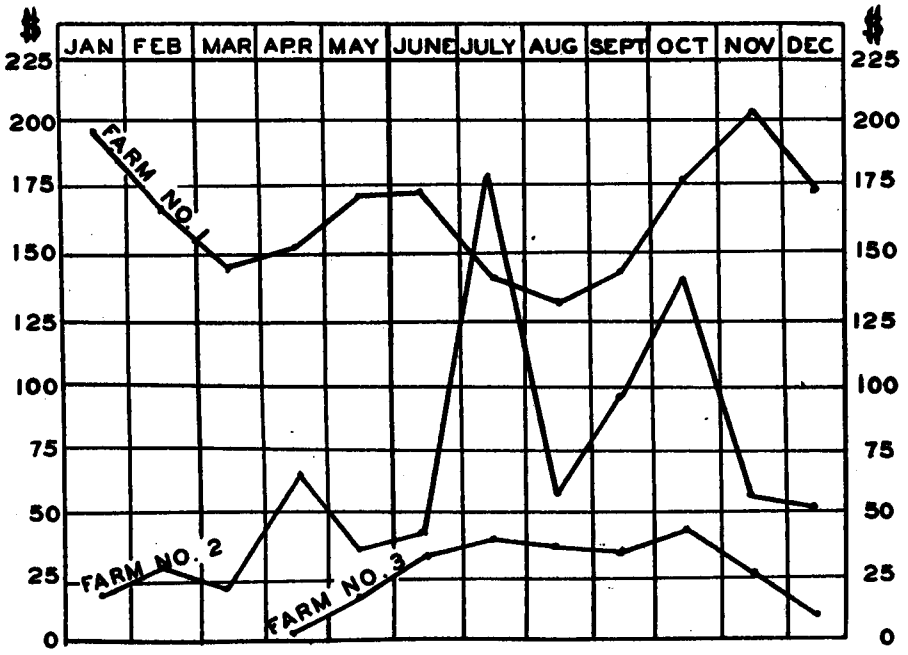
Progress in Herd Improvement

Improvement of the dairy herds on the illustration stations is being approached from three angles, namely, better feeding and breeding practices, also general health. With the organization of these farms on a systematized cropping program, provision is made for the growing of such necessary succulent crops as turnips, mangels or corn; for ample supplies of legume hay and home-grown concentrates, also for better pastures through fertilization and improved pasture management.

All operators use pure-bred sires, and keep individual milk records of their dairy herds. These sires are selected from the standpoint of production and breed type, in keeping with the financial status of the different operators. Buildings are being steadily improved with respect to ventilation and light. Each year additional herds are being brought under the accredited herd system. The effect of employing these principles systematically over a period of years may be appraised from the results obtained in the way of increased milk production. For the 12-year period from 1926 to 1937 inclusive, the average milk production for the herd at Joliette increased from 5,326 to 7,365 pounds; at L'Annonciation 3,482 to 4,973 pounds; St. Constant 5,691 pounds to 9,791 pounds; St. Etienne des Gres 5,026 to 6,755 pounds; St. Jerome 3,480 to 7,863 pounds; and St. Simon from 7,042 to 7,128 pounds. The average production per cow on the stations named, has increased by 2,603 pounds during the 12-year period.

For five station herds in eastern Quebec production figures for 1929 and 1937 are as follows: At St. Vallier, the milk produced per cow in 1929 was 4,562 pounds and 6,066 pounds in 1937; St. Eleuthere in 1929, 4,094, and 6,346 in 1937; Nouvelle in 1929, 3,427 and 5,237 in 1937; St. Pierre d'Orleans in 1929, 3,291, and 6,805 in 1937, and Causapscal in 1929, 5,146, and 6,891 pounds in 1937. For the five stations, the average annual increase per cow during the eight-year period was 2,165 pounds of milk.

MONTHLY REVENUE FROM THE SALE OF MILK THROUGHOUT THE YEAR 1937 ON THREE FARMS TYPICAL OF CENTRAL QUEBEC



POULTRY FLOCK IMPROVEMENT

Considerable progress has been made in the improvement of poultry flocks during the four-year period 1934-37, due largely to the work of the operators and the co-operation of the Poultry Division, Central Experimental Farm, Ottawa. Special efforts were made to build up, on illustration station farms, high quality flocks of 100 laying hens. Barred Plymouth Rock is the breed generally kept, although, a few operators are breeding Rhode Island Red and White Leghorn.

Through the co-operation of the Poultry Division, all the flocks owned by station operators in the province of Quebec, have been blood tested for pullorum disease. In 1936, 5·7 per cent were found to be reactors, and in 1937, 3·9 per cent. In 1936, nine flocks were found to be free of pullorum disease, and 14 free in 1937.

The following table summarizes the production of the flocks on the illustration stations in eastern Quebec:—

POULTRY FLOCK RECORDS IN EASTERN QUEBEC

Station	—	Number of birds	Egg production	Average price per doz.	Total revenue
				$ cts.	$ cts.
St. Pierre	Per bird		223		6 22
	Whole flock	115	25,680	0 33	716 01
Causapscal	Per bird		203		4 39
	Whole flock	35	7,135	0 26	153 95
L'Islet	Per bird		154		3 69
	Whole flock	39	6,039	0 29	144 27
St. Angèle de Rimouski	Per bird		186		4 31
	Whole flock	95	17,688	0 28	410 13
Maria	Per bird		164		3 37
	Whole flock	30	4,929	0 25	87 09
Nouvelle	Per bird		138		2 77
	Whole flock	20	2,760	0 24	55 55
Luceville	Per bird		138		2 90
	Whole flock	36	4,952	0 28	104 41
St. Vallier	Per bird		152		2 75
	Whole flock	79	12,036	0 22	217 88
St. Arsène	Per bird		134		2 85
	Whole flock	83	11,152	0 27	237 17
St. Eleuthère	Per bird		88		1 87
	Whole flock	109	9,566	0 26	203 46
Sayabec	Per bird		107		2 35
	Whole flock	83	8,948	0 26	195 78
Average		65·8	153	0 27	3 44
Average 1935-36		47·0	135	0 25	2 81

The above table shows a total revenue of $3.44 per bird for 1937, an increase of $0.63 over the average for the two preceding years. This increase was due mainly to increased egg production and to a higher average selling price. The sale price was raised considerably at St. Pierre by disposing of 295 dozen eggs to the co-operative hatchery.

Production records kept at the various stations in the western Quebec district of supervision show the following profits per bird: L'Acadie $1.61, L'Annonciation $0.25, Joliette $1.94, St. Constant $1.39, St. Etienne des Gres $3.19, St. Jerome $2.07, St. Hermas $1.00, St. Simon $3.64 and an average of $1.89 for all stations. The average number of birds kept at the above stations was 75 and the average number of eggs per bird was 144.

Swine Breeding

Hog raising has developed as a leading project during recent years in eastern Quebec. With the exception of three station farms, operators head their swine with registered Yorkshire sires. Throughout the past few years there has been a steady grading up to a point where in the 1937 season nine operators were keeping pure-bred Yorkshire swine. The majority of this breeding stock traces back to the advanced registry herd of the experimental station Ste. Anne de la Pocatiere.

The infusion of superior bacon blood has been of widespread benefit to the neighbourhoods surrounding the stations. In the winter of 1936-37, 175 sows

came to station farm boars. The sales of advanced registry stock from Ste. Anne through operators and supervisor amounted to 25 animals in 1936.

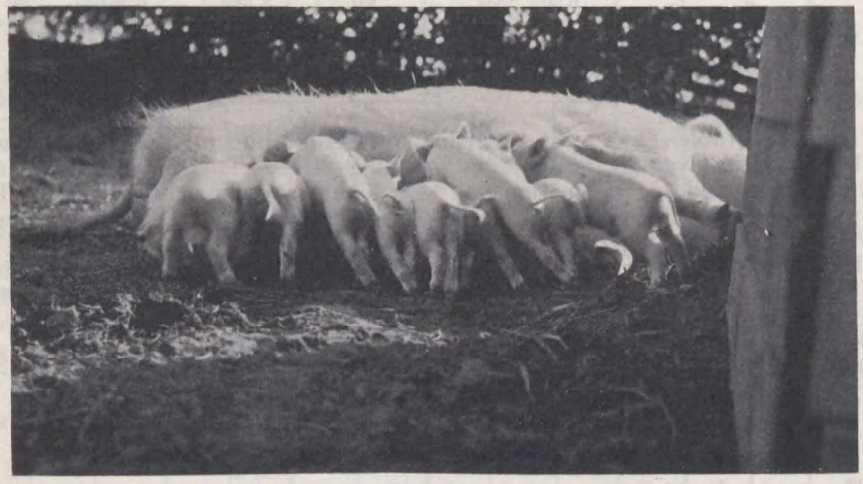
The table below gives a summary of hog production on the illustration stations of the eastern Quebec district in 1937.

HOG PRODUCTION IN EASTERN QUEBEC

Station	Number of sows	Number of litters	Pigs per litter	Revenue	Expense	Profit	
						per station	per sow
				$ cts.	$ cts.	$ cts.	$ cts.
St. Vallier	2	3	11	309 09	180 40	128 69	64 34
Sayabec	2	2	10	325 73	325 00	0 73	0 36
Luceville	1	2	13	146 50	120 60	25 90	25 90
Maria	1	1	9	92 84	34 50	58 34	58 34
Ste. Anne des Monts	2	2	10	208 38	111 55	96 83	48 41
St. Eleuthère	1	1	13	152 40	140 00	12 40	12 40
St. Paul de Montminy	1	2	11	242 00	197 08	44 92	44 92
St. Siméon	1	1	9	98 00	56 10	41 90	41 90
Ste. Angèle de Rimouski	2	4	10	291 00	141 80	149 20	74 60
Nouvelle	2	2	9	132 50	77 65	54 85	27 42
L'Islet	2	3	8	235 82	134 00	101 82	50 91
St. Pierre I.O.	1	2	13	159 42	110 55	48 87	48 87
Grandes Bergeronnes	2	3	10	231 75	119 00	112 75	56 37
Causapscal	3	6	10	539 17	180 31	358 86	119 62

Sales of four-month-old boars at breeding stock prices explain the relatively higher receipts at Causapscal and Ste. Angele.

For the young pigs alfalfa and barley meal in equal parts made available through a self-feeder, worked out economically at Causapscal. Skim-milk at all stations was a recognized part of feeding procedure.



The sale of hogs made up ten per cent of the revenue on farms operating as illustration stations in 1937.

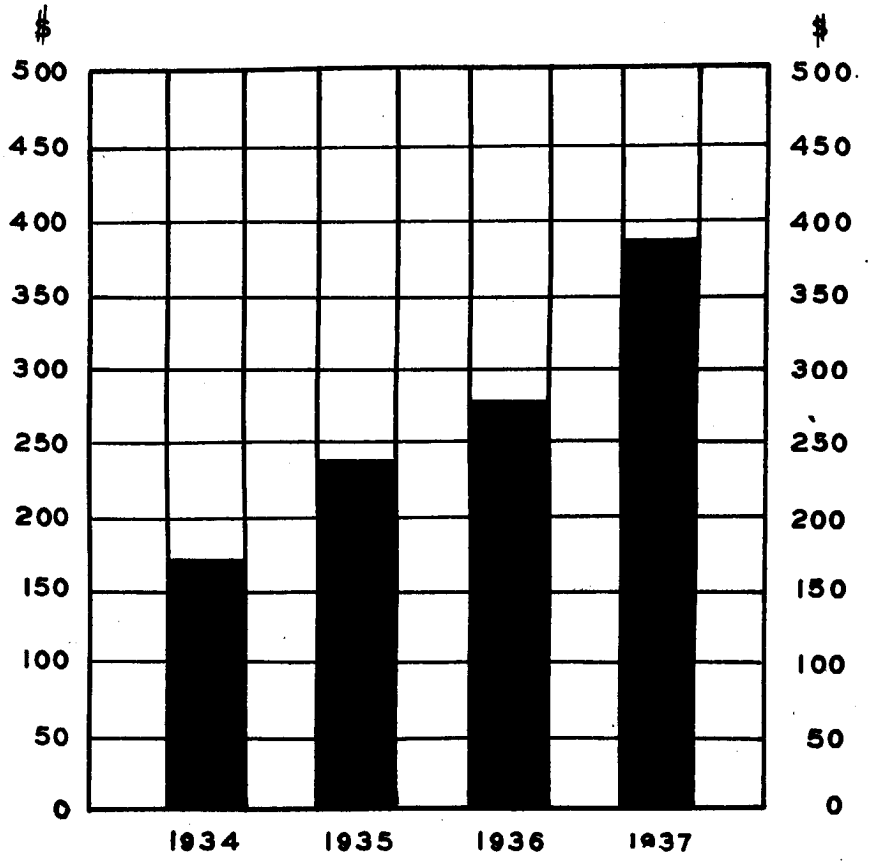
Poultry as a Contributor to Farm Revenue

Poultry is increasing in importance as a contributor to the revenue taken in on farms operating as illustration stations in Quebec. Larger, healthier and better bred flocks associated with improved feeding rations, are the main contributing factors. In 1937 the sales of poultry products represented 18 per cent

of the total sales of produce made by operators in this province. From the accompanying graph it will be noted that the sale of eggs on the stations in central Quebec has substantially increased each year during the period 1934 to 1937 inclusive.

The average sale of eggs per station during the years 1934-35-36 and 1937 amounted to $172.24, $233.19, $277.44 and $389.83 respectively.

AVERAGE INCOME FROM THE SALE OF EGGS ON FARMS OPERATED AS ILLUSTRATION STATIONS IN CENTRAL QUEBEC



Field Days

During the period covered by this report, 127 Field Days were held on the illustration stations located in the province of Quebec, with a total attendance of 20,088 persons or an average of 158 per meeting.

The Field Days were organized by the District Supervisor in co-operation with the county Agronome, as representative of the provincial Department of Agriculture. At several points, in addition, live stock and poultry specialists took an active part in the program. Fieldmen of the Production Service gave generous assistance at these events, particularly Mr. Camille Bouchard, who lectured at all the Field Days organized in central Quebec. Among other co-operators might be mentioned Mr. Everett MacKey, Assistant, Flax Division, Jean L. Roy, Inspector, Poultry Division, and Mr. P. E. Sylvestre, Division of Animal Husbandry.

REPORT ON THE ILLUSTRATION STATIONS IN ONTARIO 1934 TO 1937

There are 17 illustration stations in active operation in the province of Ontario. Of this number five are situated in the counties of Prescott and Russell, dealing with problems incidental to eastern Ontario agriculture, and are supervised from the Central Experimental Farm at Ottawa. The station at Caledonia Springs is conducting a special study of problems with peat soils, while that at Bourget deals specifically with the home canning of vegetables. In 1937 studies of a special nature were begun at Fournier with reference to the fertilizer requirements of hops, and considerable progress has been made during this first year of work.

The seven stations located in the extreme north are in the Temiskaming and Cochrane districts in the great clay belt. This group of stations have specific problems which, while they vary individually, are representative of conditions under study at the experimental station at Kapuskasing, and are supervised from that point. The remaining five stations, which are classified as the northwestern region, are supervised from the Central Experimental Farm Ottawa, with exception of those situated at Emo and Dryden, in the Kenora-Rainy River districts, which come into the territory supervised from the Brandon experimental farm.

The locations of the stations, the names of the operators and the officers in charge of work at these points, are as follows:—

EASTERN REGION: *W. L. Chauvin, A. E. Barrett, B.S.A.*

St. Eugène	Prescott County	Albert Séguin
Caledonia Springs	Prescott "	A. D. & H. Gauthier
Fournier	Prescott "	Leonard McCulloch
Bourget	Russell "	Jules Potvin
Casselman	Russell "	Hector Laflèche

NORTHERN REGION: *F. X. Gosselin, B.S.A.*

Earlton	Temiskaming District	Michel Paiement
Ramore	Cochrane "	Jeremie Hérard
Val Gagné	Cochrane "	Hector Labrèche
Timmins	Cochrane "	A. Bélanger
Cochrane	Cochrane "	E. D. Carrère
Mattice	Cochrane "	Arthur Brouard
Moonbeam	Cochrane "	Alex. Lacroix

NORTHWESTERN REGION: *D. A. Brown, B.S.A., A. E. Barrett, B.S.A.*

Verner	Nipissing District	André Beaudry
Mindemoya	Manitoulin Island	Wm. A. Hare, Jr.
Thessalon	Algoma District	R. H. Seabrook
Dryden	Kenora-Rainy River	R. J. Johnston
Emo	Kenora-Rainy River	Charles Linquist

The purpose of grouping these stations is to establish their geographical location, where soil and seasonal conditions usually bring about a similarity in the type of agriculture. Throughout this report reference will be made to work conducted at the above named points and in co-operation with the operators as listed.

Precipitation and Growth of Crops

Precipitation is usually considered as one of the most important factors controlling crop production. The total precipitation for any one year is not of as great interest as the amounts received at various times throughout the growing season. The weather for the four years under study may briefly be reviewed as follows.

The spring of 1937 was about normal in regard to precipitation in the eastern region but in the northwestern area a period of prolonged dry weather had a serious effect on germination, thus in many cases the root crops were a total failure. The spring of 1936 was cold and wet, and seeding operations were generally delayed throughout the province, being one to two weeks later than in 1934 or 1935. The growing season was quite favourable in the eastern region in 1936 and 1937, several beneficial rains being experienced during this period. In 1934 conditions were favourable to growth in the east but drought experienced in the northern and northwestern regions seriously affected crop growth. In general the season of 1935 was satisfactory for growth at all stations excepting Thessalon, which suffered rather severely from drought during the latter part of the growing season. Drought conditions in 1937 damaged the grain crops at Thessalon and Mindemoya but not to the same extent as in 1936 where in many instances complete failures were recorded.

The fall of 1936 was unfavourable to successful harvesting of grain crops and considerable losses were sustained throughout the province. The grain crop of 1937 was in many cases markedly reduced by rust infection which practically wiped out all susceptible varieties. The unfavourable winter of 1936-1937 caused considerable injury to the new meadows and the yields recorded on the first-year hay crop were very much reduced in 1937.

Description and Organization of Station Farms

ST. EUGENE, PRESCOTT COUNTY

Operator, Albert Séguin

This station is located in the county of Prescott within two miles of the Quebec border and has been in operation since 1926. The soil can be classed as clay grading to sand and gravel and is of medium fertility. The farm comprises an area of 100 acres which in 1936 was divided into five equal fields with the object of establishing a five-year rotation of crops. The purpose of this arrangement is to reduce the hay acreage and encourage greater production of cereal grains and ensilage corn, thus tending to increase the operating efficiency of this farm.

The dairy herd of 16 grade Holsteins is an important enterprise on this station and was responsible for a total revenue of $870.75 in 1937. Individual milk records are kept and selection work is carried on from this basis with the aim of developing a higher average production in the herd. Hogs form a constant source of revenue, $352.88 being derived from this enterprise in 1937. The three-year rotation practised on the hog pasture ensures a constant supply of green feed and allows production of a finished hog at a relatively low cost per unit. A flock of 72 Barred Rock hens is another profitable enterprise on this farm. The flock is pullorum tested each year and surplus breeding stock or hatching eggs are available to farmers in the immediate districts. Cash crops combine with the other enterprises in making up the farm income.

CALEDONIA SPRINGS, PRESCOTT COUNTY

Operators, Messrs. A. D. and H. Gauthier

The illustration station is located in the county of Prescott about 60 miles east of Ottawa. The farms in this area are so laid out that practically all have a portion of their area extending onto the Alfred peat bog. In the original state, the peat soils of the Alfred bog, in common with other like deposits, are too wet to produce cultivated crops. A municipal drainage canal with its outlet at Caledonia Springs has been excavated to provide the necessary drainage for the individual holdings. Because of the value of peat lands and their importance to the farmers in the district, where large portions of their farms were on the bog, the illustration station was established in 1931. The aim as set forth in the original establishment was to study the problems incidental to the cultivation of peat soils, and what crops were best adapted to this particular peat land. During 1934, 1935, 1936, and 1937, work has continued in furtherance of the previous results published in 1933, when the general outline and preliminary findings were discussed.

Burning Compared with Clearing without Burning

The common practice in the Caledonia district, when clearing peat lands for cultivation, is to brush, plough, and burn off the top five- to seven-inch layer, the ash thus formed supplying some plant food to stimulate crop growth. This practice has served as the basis for all experimental work, one-half the area being subjected to a burning and the other half brought into cultivation from the natural state. Indications are that burning is an unnecessary practice, removing a great deal of the active organic matter, even though a certain contribution to crop growth is made through the ash. The corn crop over a period of four years has averaged 15·01 tons on the unburned area as against 8·14 tons on the burned. Potatoes registered a yield over the four-year period of 120·6 bushels on the unburned check plot, against 67·8 bushels on the burned check area. Potatoes on the unburned have shown a more definite response to chemical fertilizer than they have on the burned area. The celery crop displayed another type of result in that it tended to succeed better on the burned area, producing on the average a larger, better quality head than that harvested on the unburned section. Turnips and mangels are doing slightly better on the burned section but not to an extent which would warrant such a practice.

Crop Response to Manure and Fertilizer on Peat Soil

To ascertain the plant food requirements of the Caledonia peat soils, a series of plots was laid out in 1931 and subjected to treatments of different fertilizers and fertilizer combinations. This work has been continued on a larger scale and the combined results for the four years under discussion afford some interesting data.

Applications of potash have continued to give the greatest response in terms of crop growth. Where potash was excluded from the fertilizer mixture, a definite drop in yield was recorded. The lack of phosphate exerts a downward influence on yield but not to the same extent as does the absence of potash. The highest yields are registered from a combination of barnyard manure at the rate of 10 tons per acre and 750 pounds of a 4-8-10 fertilizer. The presence of manure serves to generate bacterial activity in the peat land thereby aiding the release of plant food materials. With the potato crop, an application of 10 tons of manure and 750 pounds of 4-8-10 chemical fertilizer gave an average yield, over the four years, of 289·58 bushels, against the check which registered 120·6 bushels and the no-potash plots which yielded 218·2 bushels.

Celery shows a remarkable response to high potash fertilizers on the Caledonia peat soil, giving an average yield of 12·24 tons from an application of 1,500 pounds of a 4-8-10 chemical fertilizer, against an average recorded on the check plot of 4·0 tons. Celery on the unburned area registered the greatest returns from an application of 10 tons of manure and 750 pounds of a 4-8-10 fertilizer per acre. The optimum fertilizer application seems to be barnyard manure applied along with a complete chemical fertilizer. The results over the seven years of experimental work indicate that for successful hoed crop culture, potash is essential in the fertilizer application, and that phosphorus may, to a certain extent, be considered as a limiting factor.

Clover Hay at Caledonia Springs, Ont. Left, production from plot which received an application of complete fertilizer; centre, no potash; right, no nitrogen. These soils respond to potash treatments, particularly where the land is burned when clearing.

Cereal Crops

A great deal of difficulty is experienced in the growing and successful ripening of cereal crops on the Caledonia peat deposit. Until 1936 it had been found that even barley, a normally early maturing crop, while making adequate vegetative growth, failed to fill and develop a normal kernel. It would seem that some element other than nitrogen, phosphorus, or potash might be the limiting factor. In 1936 a series of trace-element trials was conducted, using boron, magnesium, sulphur, copper, and zinc as the elements most likely to be lacking in this type of a peat deposit. The commercial preparation, rocksol, was also included in the test. The positive results derived from applications of boron and magnesium and the surprisingly negative result derived from copper, was sufficient incentive to include these three in a further test during 1937.

Through the two years boron has registered an average yield of 42·0 bushels per acre, magnesium 31·1 and copper 23·0 bushels in comparison to the check which recorded a return of 31·8 bushels per acre. A survey of the above results would indicate that possibly the minor elements may have a bearing on cereal crop production on this area but at the present time any conclusions drawn must be of a tentative nature. Work is proceeding on this problem and a more intensive study is planned during the 1938 crop season.

Crops Adapted to Calendonia Peat Soils

In general it can be stated that most crops which succeed well on mineral soils can be successfully grown on the Caledonia peat lands. Hoed crops such as turnips, mangels, potatoes, celery and other truck crops attain relatively high yields and excellent quality. Very satisfactory hay crops are grown and in 1936 clover gave a yield of 3·23 tons to the acre. From information gathered to date oats and barley succeed much better than wheat. The trace-element work conducted during 1936 and 1937 adds further to the knowledge concerning the successful growing of cereal crops on the peat land. Crop adaptability depends to a great extent on length of growing season. Those crops or varieties which have a relatively short growing season should succeed well on peat soils. The danger in growing a long season crop is that late spring and early fall frosts introduce a certain hazard to ultimate success.

FOURNIER, PRESCOTT COUNTY

Operator, Leonard McCulloch

The year 1937 marks the inception of work directed to the study of suitable fertilizer applications for hops in the Fournier district. The prevailing soil type in this area is sand loam, well drained and admirably suited to hop culture. At the present time there are some 100 acres devoted to hop growing in this area, the baled product being marketed through the brewing corporations in the nearby city of Montreal, Que.

Hop yard on the farm of Leonard McCulloch, operating as an illustration station at Fournier, Ont. Clean cultivation is important.

There are three well known varieties of hops cultivated in Canada, the Cluster which is a late high yielding variety but susceptible to mildew, the Golden Kent and Fuggles which are classed as early varieties resistant to mildew. The Cluster variety is a higher yielder than either Golden Kent or Fuggles, but its susceptibility to mildew renders it more hazardous to cultivate. The Fuggles is generally cultivated in the Fournier area and all fertilizer trials have been carried out on this variety.

The object of the experiment has been to test the effect of the three main fertilizer elements in the presence and absence of lime on a hop garden, the whole of which receives a uniform basal dressing of manure at the rate of 20 tons per acre. This series of treatments was laid out in two replicates, each treatment appearing twice in the area under consideration. Nitrogen was

applied in three forms, nitrate of soda 65 pounds per acre, sulphate of ammonia 100 pounds, and tankage 167 pounds per acre. Superphosphate (20 per cent) applied at 350 pounds per acre and muriate of potash at 200 pounds per acre were the respective sources of phosphoric acid and water soluble potash. The complete fertilizer plots received an application corresponding to 750 pounds of a 4-8-10 commercial fertilizer per acre. The finely crushed limestone was applied to all plots receiving lime, at the rate of one ton per acre.

The results from this one year of experimental work bring several interesting facts to light. Nitrogen has consistently given an increase in yield wherever it has appeared in the fertilizer mixture. Phosphate has given a greater response than has the potash application and might have a certain effect on the cone set. The greatest yield has been derived from an application corresponding to some 750 pounds of a 4-8-10 fertilizer per acre, a yield of 1,322 pounds of kiln-dried hops per acre being recorded. Lime has offered some stimulation when applied in combination with nitrogen but the same result is not observed when it is applied along with phosphate or potash. It would not be practical to form any conclusions from one year's results but present indications are that results of a fact-finding nature should be derived from these trials.

BOURGET, RUSSELL COUNTY

Operator, Jules Potvin

Bourget is located in the easterly part of the county of Russell. The farm comprises an area of 123 acres of which 111 acres are under cultivation. The soil can be classed as sand excepting one field at the lower levels of the farm. The remainder is rough land which provides a certain amount of pasturage for the dairy herd.

The station activities are pretty much confined to the home canning project which has been under study since the first year of establishment. Six acres of land has been set aside for this special study and a three-year rotation is practised, the produce from two acres being canned each year. The remainder of the tillable area has been measured and divided so as to conform to the establishment of a five-year rotation. The most common crop grown in the district is potatoes which succeed very well on this sandy soil. Appreciable crops of corn are grown and a silo has been erected to provide storage.

The dairy herd of eight grade Ayrshire cows is on an individual milk record system thus allowing for improvement through selection. A flock of 70 Barred Rock hens is an important part of the farm organization, considerable income being derived from this source. The flock is pullorum tested each year and all reactors are removed. Surplus stock and hatching eggs are available to the farmers in the immediate district. Two brood sows are kept and the increase is marketed each year.

Vegetable Growing and Home Canning

The policy of growing a plentiful supply of vegetables is encouraged at all stations, but at Bourget the main activities have, to date, centred around the production of vegetables for canning. This study includes the production and processing of vegetables as well as the most profitable procedure to follow in disposing of the finished product. The sandy loam soil type has been found to be well adapted to this work and considerable interest has been developed in the home canning of vegetables, as a cash crop. A three-year rotation is practised, a clover sod being broken up after the hay is removed, and summer cultivated to control weeds, in preparation for planting to vegetables the

following season. For the years 1934, 1935, 1936, and 1937 the operator recorded an average yield per acre of 3,114 cans of corn, 3,161 cans of tomatoes, and 5,179 cans of string beans. The average costs per can over the same period were, corn 4·08 cents, tomatoes 6·62 cents, and beans 6·00 cents. These products have been in good demand and are readily disposed of through the wholesale grocery houses.

CASSELMAN, RUSSELL COUNTY

Operator, Hector Laflèche

The illustration station at Casselman is situated about 45 miles southeast of the city of Ottawa. The farm comprises an area of 79 acres which is practically all under cultivation. Because of its location on the Canadian National line to Montreal, a ready market is available for all surplus live stock. The farm is on the outskirts of the village where, in addition to the live stock marketing facilities, an egg-grading station has been established. The soil is a clay loam in a high state of fertility. The dairy industry predominates in the district and some very fine herds can be found in the vicinity.

The dairy herd of ten registered Ayrshire cows is the most remunerative enterprise on this farm. Individual records are kept and selection is carried on from a production and conformation standpoint. The bacon market at Montreal offers considerable attraction and two Yorkshire sows are kept the year round for breeding purposes. A good flock of Barred Rock hens contributes substantially to the revenue derived from the farm.

EARLTON, TEMISKAMING DISTRICT

Operator, Michel Paiement

The station is located within 20 miles of New Liskeard in the clay belt of northern Ontario. The farm has an area of 148 acres which is all under cultivation. The soil on this farm, like others in the district, is a clay loam of relatively high fertility. The original study project, a six-year rotation, has proved well suited to prevailing conditions and the whole farm has been brought under the same system. Such a rotation consists of a hoed crop, grain seeded, followed by four years in hay.

The general crop work deals largely with the production of cereal and fodder crops. Alfalfa has been introduced into the hay mixture and has served to increase the yield and quality of the forage to a great extent. Red clover succeeds very well in this district and a yield of 2·0 tons per acre was recorded in 1935. Red clover seed is harvested whenever the season permits, and some very acceptable yields have been registered. Early maturing varieties of cereals are grown in order to conform with the relatively short growing season.

The herd of nine grade Ayrshire cows is on a daily record system and an effort is being made to develop a higher producing herd. Three brood sows are kept each year. The poultry enterprise is assuming greater importance and in the fall of 1936 a foundation stock of 50 pullets was purchased from the experimental station at Kapuskasing.

RAMORE, COCHRANE DISTRICT

Operator, Jeremie Herard

Ramore is in the Cochrane district within 35 miles of the mining district of Kirkland Lake. The farm comprises an area of 80 acres of which 60 acres is under cultivation. The soil is characteristic of the clay belt area in that it is rather heavy and does not lend itself to the easy preparation of a seed bed. A six-year rotation is in practice and forms the basis for crop testing work.

O.P.V. is one of the common fodder crops grown and good yields have been obtained. Alfalfa has been grown experimentally on small plots and in 1936 five pounds per acre was included in the seeding mixture. Alaska oats have been introduced into this district, replacing a later variety which had given only mediocre results.

The dairy herd is still a minor enterprise but constant impovement is being made. A pure-bred Yorkshire boar is kept and its services are available to the farmers in the district. The poultry enterprise has not been developed except to provide for home consumption.

VAL GAGNE, COCHRANE DISTRICT

Operator, H. Labrèche

This station is located midway between Kirkland Lake and Timmins. The area of the farm is 151 acres, all under cultivation. The soil is characteristic of the area being a relatively heavy clay. In 1935 the six-year rotation, which had been under study on the experimental fields, was extended to include the whole farm. Alfalfa has been introduced into the seeding mixture and a much higher quality of hay has resulted. Early maturing varieties of cereals are grown and any surplus seed is disposed of in the district.

The dairy herd of 11 cows contributes in a substantial way, to the total farm revenue. The herd is headed by a pure-bred Ayrshire sire and two heifer calves are reared each year. Individual milk records are kept so that the low producers can be segregated from the herd. Four brood sows are kept and the surplus stock finds a ready market in the district. A flock of 30 hens supplies eggs for home consumption as well as being a source of hatching eggs and breeding stock to farmers in the district.

TIMMINS, COCHRANE DISTRICT

Operator, Arthur Belanger

The farm on which this illustration station is operating comprises an area of 160 acres, of which 100 are under cultivation. Since the establishment of work at this point, four years ago, some 60 acres of land have been brushed, cleared and prepared for cropping. This clearing is part of the farm program, which aims to develop a six-year rotation consisting of hoed crop, grain seeded to grass and clover, mixed clover hay, mixed clover hay, timothy hay, and pasture. This arrangement of crops aims to supply a balance between forage and mill feeds to adequately provide for the dairy herd of 22 pure-bred and grade Holstein cattle.

The station being located within close proximity to the mining town of Timmins, the operator disposes of the milk from his herd to the city fluid milk trade. Individual milk records are kept and production has been satisfactory, because of the abundance of feed and the use of brewers' grain.

COCHRANE, COCHRANE DISTRICT

Operator, E. D. Carrère

This station is situated two miles north of Cochrane in the great clay belt. The total area of the farm is 150 acres of which 118 acres are under cultivation. The six-year rotation which has been under study for ten years on a trial area, has been extended, taking in the whole farm in 1936. Drainage and cultural practices have been important projects considered. Alfalfa has been introduced into the hay mixture resulting in a decided increase in yield and quality of the hay crop. Early maturing varieties of grain are grown and surplus seed is available to the farmers in the district.

The dairy herd improvement policy is in practice on this farm and three cows were put on a daily record system in 1936. The stock is of mixed dairy breeding, but grading up has been practised by using a registered Ayrshire sire. One brood sow is kept and her offspring are disposed of for breeding purposes. A flock of Shropshire sheep which is headed by a pure-bred ram provides a certain revenue each year. The lambs and surplus stock are sold on the local market at Cochrane. Poultry and cash crops combine to form a very profitable marketing enterprise. Vegetables and small fruits are produced and find a ready market in Cochrane. The flower garden has assumed a commercial value and considerable additional revenue is derived from this source.

MATTICE, COCHRANE DISTRICT

Operator, Arthur Brouard

This farm is located 20 miles east of Hearst in the Cochrane district. The area of the farm is 122 acres of which 60 acres are under cultivation. The station has been measured and the fields laid out so as to conform with the establishment of a six-year rotation. Early maturing grains are grown and very acceptable results have been obtained. Alfalfa was introduced in 1934 and has influenced the yield and quality of the hay to a marked extent. Two or three acres of potatoes are grown each year as a cash crop.

The live stock set-up is still a minor enterprise. Five cows are kept to provide milk and butter for the needs of the household.

MOONBEAM, COCHRANE DISTRICT

Operator, Alex. Lacroix

Illustration station work was begun on this 150-acre farm in 1937. During this same year the farm was measured and divided to conform with the establishment of a six-year rotation so as to provide the proper balance of home grown feeds for the live stock as well as to allow for the inception of a constructive fertility maintenance program. Potatoes, O.P.V., oats, barley, clover, and timothy hay are the crops featured on this station and some very acceptable yields are recorded. Station operations have as yet been confined to the reorganization of the farm with the idea in mind of creating a self-sustaining agricultural unit.

The live stock set-up is a project of major importance. A herd of 20 cows of Ayrshire breeding headed by a pure-bred Ayrshire bull constitutes a profitable enterprise. The whole milk is disposed of in Kapuskasing through the fluid milk trade. A flock of 180 Barred Rock hens recorded an average profit of $3.80 per bird through the 1936-37 season. In the spring of 1937, some 1,050 chicks were purchased from the experimental station at Kapuskasing and it is proposed to increase the flock to 500 hens in 1938.

A new poultry house was constructed in 1937 to coincide with the expansion of this branch of the farm business.

VERNER, NIPISSING DISTRICT

Operator, A. Beaudry

The illustration station at Verner is situated within marketing distance of the city of Sudbury. The type of agriculture carried on is typical of the area served, in that all departments of the farm organization are developed to assume equal importance. This arrangement tends to evolve a self-sustaining enterprise which, on these northern farms, is an important feature.

The farm comprises an area of 80 acres of which 77 acres are under cultivation. During 1936 the farm was laid out so that a six-year rotation could be

practised. The operator is undertaking to fence, ditch, and make any necessary improvements to one field each year. The idea in mind is to complete the arrangement by the time the sixth year has elapsed. The soil can be classed as clay loam grading to clay, and sand. The soil reaction is slightly alkaline and alfalfa serves as the basis around which the cropping program is built.

The dairy herd, which is of predominantly Ayrshire breeding, has been tuberculin tested since 1931, and is in the accredited herd class. Daily milk records are kept and form the basis of selection with the object of building up a high-producing herd. The herd sire is of experimental farm breeding and since his use, a decided improvement in conformation has been acquired. His daughters have come into production in 1937 and are proving the advisability of using a pure-bred sire. The poultry flock of Barred Rocks forms an important branch of the station activity. The flock is subjected to the pullorum test with the object of providing disease-free hatching eggs in the district. A number of cockerels are available as breeders each year to the surrounding farmers, who are using them to grade up their flocks.

MINDEMOYA, MANITOULIN ISLAND

Operator, Wm. A. Hare, Jr.

This station is situated centrally on Manitoulin island, near lake Mindemoya. The soil is a clay loam and the underlying rock is largely a shale formation. The soil reaction is such that alfalfa does very well, thereby simplifying the production of forage crops of a high nutritive value.

The farm comprises an area of 65 acres of which 45 acres are under cultivation. During 1936 the farm was measured and divided off into six fields of equal areas to conform with the establishment of a six-year rotation. The operator undertakes to make all the necessary improvements to one field each year. By the end of the sixth year a systematic cropping arrangement will have been established without incurring an exceptionally heavy expense in any one year.

The dairy herd on this station is of mixed breeding. Daily milk records are kept by the operator and selection work is based on the individual performances. A flock of sheep of Oxford Down breeding forms a very important department and the operator has attained some success at the local agricultural shows. A flock of 35 Barred Rocks is maintained to provide eggs for home consumption as well as for sale. The birds are subjected to the pullorum test each year with the object of developing a source of disease-free stock in the district. During the summer a large flock of turkeys is raised and marketed each fall. The arrangement is such that a relatively constant income can be derived from these enterprises.

THESSALON, ALGOMA DISTRICT

Operator, R. H. Seabrook

This station is situated within 50 miles of Sault Ste. Marie, hence it is well located in regard to shipping facilities.

The farm proper comprises an area of 156 acres of which 75 acres are under cultivation. The remainder of the farm is in bush and rough pasture and does not lend itself to successful cultivation. During 1936 the farm was measured and divided in order to conform with a five-year rotation plan. The topography of the tillable area is such that a great deal of leaching takes place, thereby seriously lowering the fertility level from year to year. The top soil, or humus-bearing layer, is pretty much washed away and the land is in a relatively high acid condition. Previous trials, on a small scale, have demonstrated the value of lime from a production standpoint, and further experimental work will be conducted along this line.

The herd is of Hereford breeding and milk records are kept. A poultry project is being instituted on this station in 1938 with the idea of increasing the general income and developing a self-sustaining agricultural unit.

DRYDEN, KENORA DISTRICT

Operator, Robt. J. Johnston

The main projects on this station relate to field crops, poultry and horticulture. Since the inception of station work in 1930, field crop activities have been confined to an 18-acre piece of land near the buildings. In 1937 plans were drafted for the purpose of including all of the 100 acres of arable land on this farm in a rotation of crops considered suitable for the needs of the operator, and which could be regarded as a good practical farm layout to demonstrate in this district. Mixed farming must of necessity be engaged in. Farm planning should therefore relate live stock to field crops. With this in view, the present rotation system provides a suitable balance between field crops of grain, hay, pasture, intertilled crops, and clover for seed production.

A herd of dual-purpose Shorthorns is kept. Several are registered, being bred from stock secured at the Brandon experimental farm. Hogs form an important branch of the farm enterprise and sales of pork account annually for a considerable portion of the farm income. The poultry flock of some 45 laying hens produced 6,379 eggs in 1937, an average of 142 eggs per bird. These valued at a price of 30·3 cents per dozen brought an income of $161.45.

During recent years the appearance of the farmstead has been greatly enhanced by the establishment of annual and perennial flower borders. Three years ago a modern poultry house was built and in 1937 a fully modern farm dwelling was constructed to replace the old homestead house. This new home is prominently situated and stands out as a building worthy of emulation within the district.

EMO, RAINY RIVER DISTRICT

Operator, Chas. J. Linquist

The operator of this station owns a herd of high-producing Holstein cows and sells milk to residents of the town. Feed and pasture are therefore necessities on this farm, in common with the majority of Rainy River district farms where live stock farming is largely engaged in. Because of this all the cultivated land on the 160-acre station farm was arranged into a rotation of crops in 1937, which allotted crops and acreages as follows: Oats and barley 22 acres, grass and clover hay 22 acres, pasture 22 acres, alfalfa for hay or seed 22 acres, with a fifth field of 22 acres to be devoted to required acreages of potatoes, turnips, mangels, corn, millet, and cereal test plots.

As at Dryden, hogs contribute markedly to the farm income, and until three years ago, when a serious fire destroyed the house and birds, the poultry flock was an important project on the station.

Much progress has been achieved at this station in the matter of beautifying home surroundings since work began in 1930. The dwelling house has been remodelled and painted, a new lawn, bordered by hedges and flowers, laid out, and to the south side of the house a small orchard for testing apples, plums and cherries has been planted.

Crop Rotations and Soil Management

The main advantage of improved crop rotations is to assist in maintaining the fertility of the soil, and thereby increase the yields of farm crops. A specific soil condition requires a rotation best suited to the factors involved. The projects on all illustration stations aim to study local conditions with the eventual establishment of a rotation suitable for the entire farm. Aside from the fertility

standpoint, the sequence should be such that each crop contributes to the success of the crop immediately following. Soil types influence the duration of a rotation system and particular attention is given to this factor. The rotation systems commonly practised on the illustration stations and the conditions influencing their selection are pointed out.

THREE-YEAR ROTATION

The three-year rotation has been adopted in connection with the home-canning project conducted on the illustration station at Bourget. It is primarily practised where the area devoted to this type of work is limited and constant recropping on the same area is held to be necessary. The rotation comprises: first year, hoed crop, corn, tomatoes, and beans; second year, grain seeded to grasses and clovers; third year, clover hay. The clover sod is ploughed as soon as the first crop is removed and worked so as to provide for the hoed crop the following year. This type of rotation is also suited to very light sandy soils where the fertility level requires constant bolstering.

FOUR-YEAR ROTATION

The four-year rotation is in general use on a great many eastern farms. It differs from a three-year rotation in that the second year hay is harvested as a crop. With this rotation, provision is usually made elsewhere for permanent pasture. Illustration stations are established in localities where the fertility level is often a major problem. A four-year rotation has distinct advantages in that a soil building program can readily be instituted. Such a rotation makes possible the application of farmyard manure to each field every four years. The beneficial effect of clovers is derived by turning the sod under every four years thereby making considerable contribution to the soil humus content.

FIVE-YEAR ROTATION

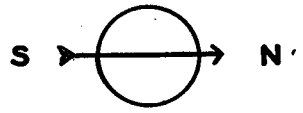
A five-year rotation has been under study on the illustration stations located at St. Eugene and Casselman, and in 1937 the main farm at Bourget was measured and laid out to conform with this cropping system. It is commonly practised in eastern Ontario where permanent pastures have not been established, and where an increased acreage in grain crops is desired. The crop sequence of a five-year rotation is as follows: Corn, turnips, or potatoes; oats, barley, or wheat, seeded to grasses and clovers; clover hay; mixed hay; pasture to August, then ploughed.

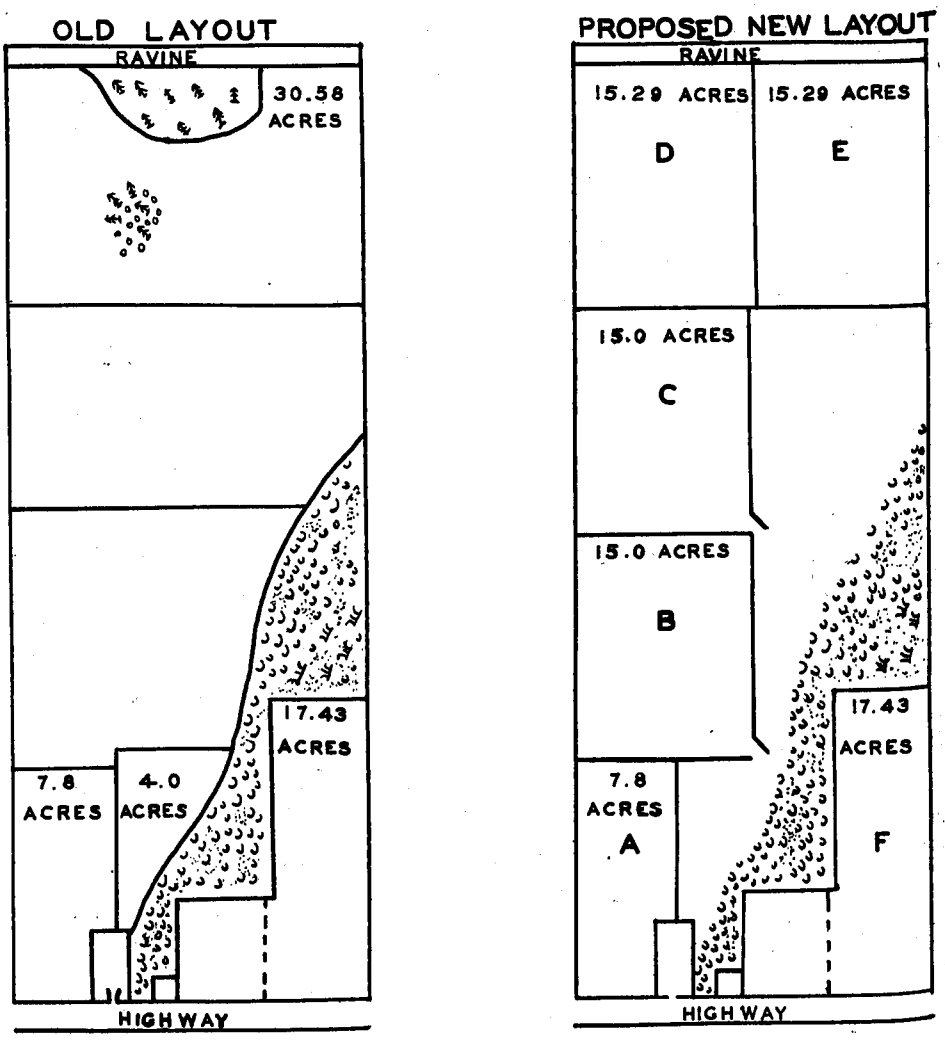
A project featured on all illustration stations in the province of Ontario has been the reorganization of the farm and the establishment of a suitable rotation of crops. In this connection the farm at Bourget was measured in 1937, and divided to conform with a five-year crop sequence. The following plans indicate the procedure in regard to the rearrangement program and the "Old" and "Proposed New Layouts" are discussed.

The improvement program instituted on this station requires the minimum amount of additional expenses. Field A is devoted to the home canning project which is in operation on the farm and comprises an area of 7·8 acres. The three large fields have been broken up into four smaller fields of approximately equal areas, namely: B, C, D, and E, which are of 15·0, 15·0, 15·29, and 15·29 acres respectively. This change can be effected with very little additional fencing and allows for a pasture field bordering the bush land which opens into all the five rotation fields. This is an important feature in that it allows for the utilization of the aftermath as pasture, thus contributing to greater flexibility in the farm management program.

BOURGET ILLUSTRATION STATION

OPERATOR: JULES POTVIN





SCALE

600'

With the evergrowing popularity of alfalfa in the eastern part of the province, the tendency has been to leave down the meadows for a greater length of time. This factor may lead to the adoption of a longer rotation so that the returns from this crop may be more fully realized, and to warrant the relatively high cost of including alfalfa in the seeding mixture.

SIX-YEAR ROTATION

The six-year rotation is in general use on the illustration stations in the northern and northwestern regions. It is especially suited to heavy soils of relatively high fertility and where hay is the most successful and economical forage crop grown. Alfalfa succeeds very well on the stations at Ramore, Earlton, Val Gagné, and Cochrane, in the northern region, and at Verner and Mindemoya in the northwestern region, and persists along with some of the hardier grasses through the sixth year of the rotation. On the stations at Timmins, Val Gagné, and Mattice, early red clover and alsike combine with timothy to yield a highly nutritive forage crop. The sequence of a six-year rotation is similar to a five-year rotation except that it provides for four years hay or three years under hay and one year pasture.

Cost of Production Studies

Illustration stations serve as outposts of the Experimental Farms System. Experimental work conducted on the centrally located farms is further verified through trials conducted on the illustration stations. On each a careful record is kept of the yields of all farm crops grown. An itemized account is kept of the hours of labour expended on each crop, any manure or fertilizer applied, and amount of seed sown on a definite area. From this information the cost of producing a unit of each crop is determined. Rent of land, taxes, and use of machinery are other items which are considered in cost of production analyses.

COST OF PRODUCING POTATOES

On 12 of the 17 illustration stations in the province of Ontario, potatoes are grown in the general rotation. Seasonal variations in precipitation and temperature influence yields to a great extent. A well-prepared seed bed and the proper balance of plant food in the soil are the best assurances of a profitable crop. The great variations in soil and climate throughout the province influence the respective costs of production at each individual station. The Green Mountain variety is featured on most of the Ontario illustration stations.

During 1937, fertilizer trials on potatoes have been conducted on the stations at Casselman, in the eastern region, Cochrane and Val Gagné in the northern region, and at all stations in the northwestern region. At Casselman an application of 10 tons of manure plus 400 pounds of 2-12-6 per acre was outstanding with a yield of 300 bushels. At Cochrane and Val Gagné 10 tons of manure per acre gave an average yield of 238 bushels at a cost of $0.24 per bushel, while the same manurial application supplemented by 500 pounds 4-8-10 fertilizer recorded 306 bushels at a unit cost of $0.22. At Verner and Mindemoya the greatest yields were derived from an application of 10 tons of manure and 600 pounds of a 4-8-10 fertilizer; 217·8 bushels and 385·0 bushels being recorded respectively at these points. On the light sand at Thessalon another type of result was recorded when 319 bushels were harvested from an application of 400 pounds of 2-12-6 supplementing 10 tons of manure. At Emo and Dryden 12 tons of manure per acre gave the most economical yield followed closely by 6 tons of manure and 250 pounds of 3-10-8 per acre. At Dryden the respective yields for these treatments were 225 bushels and 208 bushels, while at Emo a three-year average for the same treatments gives 175·3 and 175·4 bushels respectively.

The following table gives a summary of the items entering into the cost of producing a unit of this crop during the year 1937, as well as the average cost per bushel since station work was begun at these points.

POTATOES YIELD AND COST OF PRODUCTION BY STATIONS

Station	1937		Itemized statement of costs per acre 1937						Average		
	Yield per acre	Cost per bushel	Use of land and taxes	Manure and fertilizers	Miscellaneous labour	Preparation of land, planting, harvesting	Seed	Use of machinery	Number of years grown	Yield per acre	Cost per bushel
	bush.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.		bush.	$ cts.
Casselman	257·0	0 20	5 13	8 10	3 90	23 88	8 00	2 85	3	226·0	0 22
Earlton	112·0	0 37	3 05	6 00	.....	17 72	11 70	2 85	7	194·0	0 30
Ramore	360·0	0 21	3 80	6 00	.....	35 72	27 00	2 85	5	158·0	0 37
Val Gagné	295·0	0 21	2 64	6 00	.....	31 01	18 00	2 85	13	186·3	0 37
Timmins	180·0	0 29	2 80	6 00	.....	22 38	18 00	2 85	4	139·0	0 47
Cochrane	180·0	0 29	3 33	6 00	.....	22 85	18 00	2 85	4	188·0	0 34
Mattice	80·0	0 67	2 90	6 00	.....	24 04	18 00	2 85	7	165·1	0 51
Verner	202·6	0 20	4 16	8 40	4 91	13 53	7 20	2 85	3	159·7	0 27
Mindemoya	305·0	0 17	4 03	8 40	3 49	21 59	10 80	2 85	7	235·5	0 26
Thessalon	270·0	0 14	1 94	8 40	4 54	10 16	9 00	2 85	6	145·0	0 41
Dryden	196·6	0 19	2 40	6 00	4 70	20 11	15 00	1 35	6	171·6	0 20
Emo	94·4	0 37	2 50	1 20	7 36	7 89	15 00	1 35	7	147·1	0 25

A review of the tabular data presented discloses that a great variation is experienced in the charge made for land preparation and planting. This condition arises mainly because of the variation in soil types as well as the extent and class of weeds present. The heavy clay soil in the northern Ontario region does not work down as readily after rains, hence more hours of labour must be expended in order to secure the proper state of tilth. Cost of seed is greater on the average in the north and serves to increase the unit cost of production to a certain extent. The charge for seed is based on the market price in the respective districts at seeding time. In compiling these costs the charges for horse and manual labour have been calculated on the basis of the prevailing rate of wages paid in the individual districts.

TURNIPS

Turnips are grown on eight of the 17 illustration stations in Ontario. They are not grown as stock feed farther north than Earlton. This crop is usually sown following a timothy sod which is ploughed in the early summer, worked throughout the summer until fall to control weeds, then ploughed just before the freeze-up. Manure is applied at rates varying from 10 to 15 tons per acre, the average application being 12 tons. Due to unfavourable weather conditions, the yields in 1937 were considerably reduced, but over a number of years the crop has proved profitable in the areas where it is grown. An examination of the table indicates that the highest yields are recorded at St. Eugene and Casselman where 22·53 tons and 23·11 tons were recorded respectively through 10- and 13-year periods.

Drought in 1936 exerted a depressing influence on the crop at Thessalon, while in 1937 the crop at this point was a total failure, no yields being recorded. The greater part of the expense in growing turnips is incurred through cultural operations where a great deal of manual labour is required.

CORN

Fodder corn is grown on the illustration stations at Casselman and St. Eugene, in the eastern region, and at Verner, Mindemoya, and Thessalon in the northwestern region. Over an eleven-year period Mindemoya records a yield of 13·71 tons per acre at a unit cost of $2.13. Slightly higher yields are recorded on the eastern farms, Casselman registering a 17-year average of 19·22 tons per acre at $1.92 per ton, and St. Eugene an 11-year average of 17·82 tons at a unit cost of $1.94. Corn was introduced at Verner and Thessalon in 1937 and yields of 14·69 tons at $1.51, and 12·20 tons at $2.34 were recorded at these two points. Increased yields tend to lower the cost of production yet the unit costs at Mindemoya, Verner, and Thessalon are low enough to warrant the cultivation of this crop.

The following table entitled Cost of Growing Crops in Ontario deals with the actual cost of producing a unit of turnips, oats, clover hay, and timothy hay during 1937, as well as the long-time averages recorded at the different points since the inception of illustration station work. Throughout the body of this report references are made to this tabular data and any conclusions drawn are based on the figures contained therein.

—	Turnips					Oats					Clover hay					Timothy hay				
	Number of years	Yield per acre		Cost per ton		Number of years	Yield per acre		Cost per bushel		Number of years	Yield per acre		Cost per ton		Number of years	Yield per acre		Cost per ton	
		1937	Average	1937	Average		1937	Average	1937	Average		1937	Average	1937	Average		1937	Average	1937	Average
		ton	ton	$ cts.	$ cts.		bush.	bush.	$ cts.	$ cts.		ton	ton	$ cts.	$ cts.		ton	ton	$ cts.	$ cts.
EASTERN REGION																				
St-Eugène	10	12·58	22·53	3 17	2 09	.....	.....	.....	.....	.....	7	0·96	1 58	13 43	6 59	4	1·15	2·01	9·30	8·38
Bourget	.....	.....	.....	.....	.....	10	22·5	27·0	0 73	0 61	8	0·75	0·95	19 78	15 58	.....	.....	.....	.....	.....
Casselman	13	13 ·75	23·11	3 62	2 24	10	28·0	42·6	0 71	0 45	8	1·55	2·05	9 48	6 40	.....	.....	.....	.....	.....
NORTHERN REGION																				
Earlton	6	.....	18·00	.....	3 24	7	38·0	46·8	0 39	0 37	9	0·50	1·64	25 22	8 62	7	0·75	1·21	12 01	7 58
Ramore	.....	.....	.....	.....	.....	6	63·0	43·8	0 24	0 34	5	1·00	1·42	13 78	8 48	4	1·25	1·33	7 46	7 02
Val Gagné	.....	.....	.....	.....	.....	18	42·0	39·5	0 37	0 51	17	1·00	1·88	12 96	7 30	12	1·00	1·64	9 01	7 04
Timmins	.....	.....	.....	.....	.....	4	25·0	33·4	0 60	0 54	3	1·25	1·41	10 07	9 12	2	1·00	1·00	8 71	8 84
Cochrane	.....	.....	.....	.....	.....	12	51·0	34·4	0 34	0 65	9	1·00	1·36	13 49	9 64	12	1·00	1·50	10 24	8 03
Mattice	.....	.....	.....	.....	.....	8	26·0	32·6	0 55	0 64	11	.....	1·64	.....	7 47	7	1·00	1·18	9 74	8 21
Moonbeam	.....	.....	.....	.....	.....	1	25·0	25·0	0 75	0 75	1	1·00	1·00	12 33	12 33	1	1·25	1·25	7 08	7 08
NORTH-WESTERN REGION																				
Verner	11	10·56	18·78	2 62	2 36	2	41·0	43·0	0 43	0 37	9	2·00	2·72	6 85	5 36	9	1·00	2·08	9 66	5 35
Mindemoya	12	11·25	20·28	2 42	2 13	10	.....	41·0	.....	0 43	10	1·25	1·74	10 52	9 06	9	1·00	1·56	8 40	6 73
Thessalon	3	.....	7·30	.....	3 58	4	25·0	18·5	0 65	0 81	5	1·25	1·83	8 24	6 62	6	1·25	1·57	5 69	5 59
Dryden	1	8·00	8·00	3 18	3 18	6	60·0	41·2	0 17	0 25	6	1·00	1·31	5 65	6 20	6	1·12	1·28	5 40	6 42
Emo	7	19·00	15·54	1 34	1 91	7	42·0	37·9	0 29	0 35	7	1·50	1·63	4 81	6 05	6	.....	1·21	.....	7 28

The growing of improved varieties of cereal crops with the aim of establishing a source of good seed in the respective districts is a definite project in the set-up of the Ontario illustration stations. During 1936 the stations at Cochrane, Earlton, Mindemoya, Ramore, Thessalon, Val Gagne, Verner and St. Eugene, were responsible for the distribution of a total of 945 bushels of seed grain in their immediate districts. Oats and barley are the cereals featured. From a feed standpoint these two grains are the most suitable in a mixed farming program in these districts. Oats are grown on all stations, barley on eleven, and wheat has a place on six of the stations.

OATS

The production of oats on the Ontario illustration stations is governed to a certain extent by locality. In the northern region Alaska oats succeed much better than later maturing varieties such as Banner. In the eastern and north-western regions Banner and other later maturing varieties are grown and some very satisfactory yields are recorded. A perusal of the table on page 140 discloses that the average yields at the different stations vary from 18·5 bushels, at Thessalon to 46·8 bushels at Earlton. Seasonal conditions affect the average yields to a great extent. In 1936 the oat crop was a complete failure at Thessalon and in 1937 drought and rust had a marked depressing influence on the yield. These two very unsatisfactory seasons were responsible for the reduced average yield at this point.

BARLEY

Barley is becoming more popular on the illustration stations and the acreage devoted to this crop becomes greater each year. The variety O.A.C. 21 is grown on most of the stations. At Dryden, the variety Peatland is most successful since it displays a certain degree of rust tolerance. The long-time averages recorded up to and including 1937 are as follows: Verner a three-year average yield of 32·9 bushels at a cost of $0.44 per bushel; Cochrane a three-year average of 30·7 bushels at $0.52; Earlton a three-year average of 34·7 bushels at a unit cost of $0.41; Moonbeam recorded 32·0 bushels in 1937 at $0.64, and in this same year Ramore recorded 48·0 bushels at $0.35. At Timmins and Val Gagne respective yields over two-year and three-year periods were 20·0 bushels at $0.79, and 35·0 bushels at a unit cost of $0.60. In 1937 Casselman recorded a yield of 32·5 bushels at a cost of $0.55, and at Mindemoya the average for five years is 33·6 bushels per acre at $0.53 per bushel.

WHEAT

Wheat on the eastern and northern stations is grown mainly to provide grain for the poultry flock. The adaptation of the different varieties must be ascertained before this cereal can be grown extensively in the northern areas. Wheat is not grown to any extent on the eastern stations. A two-year average for the years 1935 and 1936 records a yield of 20·0 bushels at Earlton, 14·0 bushels at Ramore, 9·5 bushels at Val Gagne, and 18·6 bushels at Verner. A yield of 10·0 bushels per acre was recorded at Cochrane in 1936 and at Mindemoya the average yield registered for 1936 and 1937 was 10 bushels at a unit cost of $1.73.

Hay and Supplementary Forage Crops

Red clover and alfalfa are grown generally on most of the illustration stations. In the extreme north, where conditions are too rigorous for alfalfa, early red clover is the most important legume grown. Two mixtures have been in use on the northern stations, the first composed of ten pounds of timothy, eight pounds of early red clover, and two pounds of alsike clover per acre, and

the second composed of eight pounds of timothy, five pounds early red clover, three pounds alfalfa (Ontario Variegated), and two pounds of alsike clover per acre. Where alfalfa has been found to succeed well, the following mixture has been adopted: timothy eight pounds, red clover five pounds, Ontario Variegated alfalfa five pounds, and alsike clover two pounds. At Emo and Dryden the mixture is composed largely of alfalfa, western rye grass, and meadow fescue or timothy.

Alfalfa flourishes on the station at Verner and is responsible for a nine-year average yield of 2·72 tons per acre which was produced at a unit cost of $5.36. The highest yield in the eastern region was produced at Casselman where an average of 2·05 tons was recorded for the eight years of station work at a cost of $6.40 per ton. In the northern area the high average yield at Val Gagne was produced at a unit cost of $7.30.

Seed Production

The production of clover and grass seed has become a remunerative enterprise on many of the illustration stations. During 1936 the sales from the stations at Emo, Dryden, Earlton, Ramore, Verner, and Casselman, totalled 3,630 pounds of high grade grass and clover seed. This policy of local distribution promotes the sowing of seed which is best suited to the specific district, in that it has been produced under local conditions of soil and climate.

Oats, Peas and Vetch

Oats, peas and vetch is grown on nine of the illustration stations in Ontario. This mixture is grown mainly to furnish extra forage during a dry pasture season or to supplement a light hay crop. It is usually grown on the hoed crop area, manure, horse and manual labour, forming the most important items of cost. This crop is popular in the northern region where turnips and corn cannot be grown profitably and a substitute source of highly nutritive forage is required. The seeding mixture is usually two bushels of oats, one bushel of peas, and one peck common vetch per acre.

The yields and costs of producing oats, peas and vetch at the different stations for the years under study are as follows:—

Cochrane	1·94 tons	at $14.52	per ton
Earlton	2·00 tons	at $13.69	per ton
Mattice	2·12 tons	at $16.66	per ton
Moonbeam (1937)	2·50 tons	at $10.60	per ton
Ramore	2·44 tons	at $ 9.80	per ton
Timmins	2·44 tons	at $12.40	per ton
Val Gagné	1·94 tons	at $12.70	per ton
Verner (1934)	2·50 tons	at $ 9.62	per ton
Thessalon (1936)	1·00 ton	at $19.42	per ton

Drought conditions at Thessalon are responsible for the low yield and relatively high cost of production at this point.

Dairy Herd Improvement

The improvement of the dairy herd is a project of major importance on the illustration stations. It is realized that through this medium, home-grown forage and coarse grains can be marketed most profitably. Improvement is being effected through the use of selected pure-bred sires, the rearing of heifers from the higher producing dams, improved feeding methods with reference to growing stock as well as the mature cows, and the removal from the herd of all low producers. All operators who maintain a dairy herd are keeping daily milk records.

The following table summarizes the records from these stations for the year 1937.

SUMMARY OF MILK RECORDS—ONTARIO 1937

Station	Breed	Number of cows	Average days of lactation	Average		Highest		Lowest	
				Milk production	Butterfat	Cow production, milk	Butterfat	Cow production, milk	Butterfat
				lb.	lb.	lb.	lb.	lb.	lb.
St. Eugene	Holstein Grades	13	279	7,139	235·0	8,643	285·0	4,489	148·0
Bourget	Grades	6	250	4,818	183·0	5,504	209·0	4,469	170·0
Casselman	Ayrshire	9	305	6,937	257·0	9,013	333·0	4,713	174·0
Earlton	Ayrshire Grades	9	280	6,868	253·3	7,974	299·2	5,221	201·0
Val Gagné	Ayrshire Grades	9	251	6,462	258·5	8,211	332·0	5,157	224·8
Timmins	Holstein	18	334	9,350	304·2	11,117	358·9	7,313	248·6
Cochrane	Grades	5	268	6,974	309·9	8,025	348·1	6,434	260·1
Ramore	Grades	2	230	7,468	327·8	7,858	330·0	7,079	325·6
Verner	Ayrshire Grades	10	338	8,758	295·0	11,238	382·0	7,267	221·0
Mindemoya	Ayrshire Grades	6	282	6,721	215·7	8,145	293·2	4,459	120·3
Thessalon	Hereford Grades	4	412	4,773	159·8	6,335	240·7	3,531	105·9

A perusal of the preceding table would indicate that in many cases further selection will be necessary to increase the average production of the herds. However some results of an encouraging nature have been recorded at Earlton where the herd average of 5,074 pounds of milk in 1934 has been increased to 6,868 pounds in 1937. At Timmins the average production in 1935 amounted to 7,646 pounds of milk and 274·73 pounds of fat and in 1937 the average production was recorded as 9,350 pounds of milk and 304·20 pounds of fat. The need for further selection is apparent, however, the results cited above indicate that constant progress is being made.

Poultry Flock Improvement

The poultry flock has a definite place in the general organization of Ontario farms and considerable additional revenue is derived from this enterprise. In the north where a balanced farm unit is essential, and the price of eggs is usually high during the winter months, the poultry flock often constitutes the main source of income. The illustration stations at Moonbeam and Cochrane were outstanding in this regard in that $3.80 and $3.52 were the respective profits recorded per bird at these points for the year 1937. Earlton and Ramore registered returns over expenses of $1.12 and $1.66 per bird for the last four months of the 1937 production year.

Field Days

Field days are an important feature of illustration station work. They provide the farmers of the district with an opportunity for meeting the supervisor, and discussing the various trials being conducted on the station. During 1937, 13 field days were held in Ontario, the total attendance being 1,652 persons or an average attendance of 127 per meeting.

Ottawa: Printed by J. O. Patenaude, I.S.O., Printer to the King's Most Excellent Majesty, 1938.