

THE BEST OF THE PAST: TRADITIONAL, SUSTAINABLE AGRICULTURE IN PRINCE

by Wayne MacKinnon and Elinor Vass

Editor: Deirdre Kessler

Prepared by the Institute of Island Studies for the Prince Edward Island Department of
Agriculture

March 1989

PREFACE

Prince Edward Island, according to one agriculturist, "is no doubt the best laboratory for studying agriculture of any place in the Dominion." (J.E. Lattimer, Economic Survey of Prince Edward Island, Charlottetown, 1954, p.4.) Whatever the merits of that assertion, this project on traditional, sustainable agricultural practices has been most interesting and rewarding. Through interviews with farmers and others involved in Island agriculture and a review of the literature pertaining to agriculture since the earliest days of Island settlement, much information has been obtained about traditional, sustainable farming methods. It is hoped that this information can provide a useful contribution to the growing debate about the future development of agricultural practices and policies, particularly in current discussions of sustainability in agriculture.

It should be made clear at the outset that the terms "traditional" and "sustainable" are not intended to be synonymous. They cannot be used interchangeably; indeed, many traditional farming practices were not at all sustainable. What this project has sought to identify, among the traditional farming methods which were used, is a "best of the past," farming practices which were, in effect, sustainable, and may still have relevance for contemporary agriculture.

The report serves the additional purpose of documenting traditional farming methods on the Island. Based on interviews with those who recall the way farming was carried on before the widespread use of chemical inputs, this report has gathered a great deal of information about farming practices well back into the last century; in another few years, a project such as this would not be possible. At the same time, the extensive bibliography of agricultural information provides a comprehensive report on the sources of such information; such a report has hitherto never been available.

The Project Director of this study acknowledges with appreciation the many people who have assisted in, and contributed to, its progress: Elinor and Stan Vass, who completed the

bibliography; John Weyman, who assisted in the interviews; Harry Baglole and Catherine Edward of the Institute of Island Studies, for overall direction and advice; Teresa Mellish, Dave Rogers and Richard Veinot of the Department of Agriculture, who formed the Steering Committee and guided this project. Above all, sincere appreciation is extended to those many individuals across Prince Edward Island who gave generously of their time and knowledge throughout other oral interviews. To them, and to their predecessors, the Island's agricultural industry is forever indebted.

Wayne MacKinnon
Project Director
March, 1989

[>>>top](#)

INTRODUCTION

As part of its efforts in carrying out the Sustainable Agriculture Assistance Program, the Prince Edward Island Department of Agriculture, together with the Institute of Island Studies at the University of Prince Edward Island Department of Agriculture, together with the Institute of Island Studies at the University of Prince Edward Island, developed this project to gather information on traditional Island farming practices that could be evaluated in today's agriculture. It proposed that data on traditional, sustainable farming practices within living memory be gathered from existing literature and oral interviews with Island farmers. The objectives of the project were outlined as follows:

1. To evaluate the application of traditional, sustainable farming techniques in today's agriculture;
2. To gather information so that a database of "the best of the past" traditional, sustainable Island farming techniques can be developed; and
3. To raise the awareness of the Prince Edward Island public that sustainable farming techniques are traditional on Prince Edward Island.

The work plan for this project included an extensive literature review (see Part II), oral interviews and publicity and public education. The literature review was completed in the fall of 1988, and the oral interviews were conducted between September, 1988 and January, 1989. Details of the project were circulated to farm organizations throughout the province, and the project has been the subject of a number of media stories, both provincially and regionally. It is also hoped that this report will serve as an ongoing source of information for those involved in Island agriculture.

Part I of this report is a summary of the oral interviews, while Part II is a compilation of a comprehensive review of available literature from the beginning of Island agriculture. This report also includes a brief summary of the interviews. Copies of the tapes have been deposited at the Provincial Archives and at the Robertson Library, University of Prince Edward Island. Researchers and members of the public can consult them at either place.

This Introduction to Part I of the report -- the results of the oral interviews -- will briefly examine the methodology and comment on the oral interview process and results. (For a methodological commentary on the annotated bibliography, see Part II.)

[>>>top](#)

Methods

A total of 53 interviews with farmers and others involved in Island agriculture were completed, and 44 interviews, ranging in length up to 90 minutes, form the basis of the summary which follows. The respondents were chosen using a number of criteria: farm background, region of the province, age and role within the industry.

Together, those interviewed represent close to 4000 years of agricultural experience; the average age of respondents is 75 years. Respondents are predominantly male, and majority were full-time farmers. Others who worked in the agricultural industry (government, research stations or farm organizations) were also interviewed. Those interviewed were chosen from names suggested to the project team by farm organizations and by others knowledgeable in the industry. As well, the project team suggested people considered to have a unique perspective on the subject matter, and followed up references from people who were interviewed.

Geographically, they represent all areas of the province: 13 from Prince County (including two from the Egmont Bay-Mont Carmel area); 18 from Queens; and 13 from Kings. The majority were of a mixed farming background (reflecting the pattern of agriculture pre-1950s) although several tended towards some specialization in either dairy, hogs, poultry, fruit and vegetable or potato production.

The focus of the interviews was on agricultural practices as they existed roughly up to the 1950s before the large-scale introduction of chemicals and mechanization. The interview format was directed towards a number of major areas: personal data (age, farm/agricultural background); farming patterns (size, land type); crops (varieties, yields, rotation); fertilization (practices, methods, sources); weed and insect control (problems, methods); tree fruits (varieties, disease and pest control); livestock (breeds, feeding, production, disease control); role of agricultural organizations; nature of farm communities (sharing of ideas, workload); and folklore traditions (conventional "wisdom"). Each of the interviews has been briefly summarized with the highlights of the subjects covered (see Appendix I)

In terms of the major findings, summarized by heading in the report, no attempt has been made to evaluate the information provided. The underlying assumption that has guided the preparation of this report is that of data collection, not of analysis. In a sense, it portrays the whats, not the whys, of the particular methods or techniques which were followed by Island farmers as they were understood. One overriding impression has, however, emerged: the majority of those interviewed followed practices carried out by their predecessors, whose understanding of farming was generally considered superior to that of current generations. What stems from the interviews are sources of knowledge and information perhaps centuries old.

[>>>top](#)

PART I

The Oral Tradition: An Overview

During the first half of the twentieth century, there were more than 10,000 farms all across Prince Edward Island. By 1951, the average farm size was just over 100 acres. Twenty-two thousand people were engaged in farming at the beginning of the century; by 1950, this number had declined to 13,000. Farming with traditional methods, more than one million acres were under production by the middle of the century. Through interviews with those who remember the farming techniques, practices, methods and beliefs, a profile emerges of Island agriculture as it was carried on before the large-scale introduction of chemical inputs.

[>>>top](#)

The Family Farm

Many of those who were interviewed were third or fourth generation farmers. They farmed the land on which they were born, or settled on another available farm nearby. The vast majority were mixed farming operations: four to five acres of potatoes, 20 acres of grain, 20 of hay, 20 of pasture and two of crops such as turnips or mangels. Many farms had older, established orchards. Each farm would also boast a livestock population of six to eight milk cows, one to four sows and a few pigs, a couple hundred hens, some geese and, more rarely, sheep. The pride of every good farmer was his horses; they were regularly exercised, groomed and, because of their importance on the farm, tended to be better fed and cared for than other animals. Many farmers grew a special ration of black oats especially for the horses. "Old Island Black," as some called it, was believed to be higher in fats and would add a lustre to the horses' coats.¹ In fact, many farmers thought they couldn't raise horses without Black Oats.²

These small mixed farms were relatively self-sufficient. In the earlier days, each farm produced the bulk of its own food. Except for salt, sugar, molasses and tea (and rum), the family farm largely provided for its own needs. Milk was shipped to a local cheese factory and many farmers grew their own wheat from which they obtained flour for bread, shorts for porridge, and bran and middlings for livestock. With their own vegetables, meat, eggs and other food requirements, all processed and preserved on the farm, there was a high degree of self-sufficiency. "It was a real good life in many ways," recalls one who grew up on such a farm, "because I think we were probably better fed than we are today. Because of this diversity of farming, we had our own produce and it was certainly produced naturally because that's the only way you could produce it. There were no additives. . . ." ³

Farm life, however, was characterized by unrelenting toil, uncertain returns and constant struggle: "It was a matter, really, of health for the family and a kind of family life and a community life and survival by producing (for) your own needs."⁴

[>>>top](#)

Crop Varieties and Yields

Across the Island, many of the early varieties enjoyed a widespread popularity. In oats, varieties such as Banner and Urban were widely grown. Other oat varieties included Victory, Abegweit and Gary; there were some imports western seed, described a Peace River oats.⁵ Black oats was widely used for horses and unlike some varieties of white oats, was highly resistant to smut.⁶ Varieties of black oats included American Beauty and Clack Norway. Wheat varieties included Red Fife, White Fife, Regent and later Marquis. Barley varieties (distinguished by two-row or six-row)⁷ included the popular Charlottetown 80, Bola and Hirtle. Another grain grown more frequently in earlier days was buckwheat ("a poor man's crop"⁸). Buckwheat was often grown on newer land and was considered to be an excellent feed for hens.⁹ It was also found to be effective in getting rid of couch grass (also know as quack grass¹⁰). In fact, buckwheat is thought to be an alternative to ryegrass as a cover crop; with a short growing period, plentiful fiber and organic matter, it is also effective in bringing up trace elements from the soil.¹¹

The use of mixed grain -- oats and barley -- was common in the early days, largely as a matter of convenience, although there was some difficulty in planting varieties which would mature together.¹¹ Grain yields of 40-60 bushel per acre were common, although several farmers reported some significantly higher yields.

Certain potato varieties were common across the Island: Irish Cobblers, Green Mountains, Dakota Reds, Early Rose, MacIntyre Blues and a number of others introduced over the years were widely grown. Each had its disadvantages: Cobblers did not produce a good yield, MacIntyres were highly susceptible to blight, and so on.¹³ Yields, on average, were in the range of 250-300 bushels per acre.¹⁴

Hay crops (mainly clover and timothy) followed grain and a good crop would yield three tons per acre. Turnips and mangels (with a yield of four to five tons per acre) were widely grown on most farms, and while not generally common, other crops included corn, vetches, flax and kale.

[>>>top](#)

Rotation

Long crop rotation was the central farming practice. A root crop, such as potatoes, was followed by one year of grain, seeded out to clover and timothy, followed by two years in hay then to pasture for one to two years then back to root crops (although several farmers sowed grain after the pasture to break up the soil, which made it easier to cultivate for potatoes). This resulted in what was typically known as a seven-year rotation, although the actual length varied by farm from four to eight years.

Farmers were strongly committed to strict crop rotation practices, following the practices adhered to by their predecessors. One farmer quoted his father as a great believer in crop rotation, taking care that he "didn't drain the soil of all the nutrients."¹⁵ Said another, "You can push the ground until it becomes useless."¹⁶ Potatoes, in particular, were never grown tow years in a row: "That was just my father's idea and it was my idea too."¹⁷

Long rotations were considered to be effective in weed control, soil conservation and in sustaining organic matter and other elements in the soil. After a long rotation, for example, the sow thistle could be easily controlled.¹⁸ It was also felt that in the "old days," what people put into the soil and what they took out more or less balanced, leaving healthier soils.¹⁹

Whether there in fact existed strong sentiments about land use, the less intensive agriculture practices which were carried out tended to be less destructive to soil conditions, although much farmland was, in effect, depleted or "farmed out."²⁰ Faced with increased financial pressures, farmers turned to shorter rotations to the point that "farming is becoming so specialized today that you don't think that much about rotation anymore."²¹ However, many operations are more conscious of somewhat longer rotations, particularly as a method of eliminating diseases in the soil.²² Longer rotations are also regarded as a means of adding humus to the soil: "I feel we have to use some of these old ideas...[using] rotation as a soil builder and get your humus in the soil back. When you have nature working for you, why do something to destroy that?"²³

[>>>top](#)

Cultivation

Another central practice followed by traditional farmers was cultivation; "that's knowing the land and how to treat it."²⁴ Using, of course, much lighter equipment, cultivation was rarely greater than three to four inches deep. Deeper cultivation is regarded as a contributor to soil erosion and as requiring higher levels of fertilization.²⁵ There is a general belief that cultivation should not extend into the subsoil.²⁶ Although deep cultivation on some soil types appears necessary because of hardpan,²⁷ others suggest that deep-rooted crops, good rotation and lack of compaction tend to alleviate that problem.²⁸ Others take a dim view of deep cultivation: "That's what's ruining the land, they're working the land too deep."²⁹

If the soil was not cultivated deeply, it was cultivated often, using a spring tooth harrow, for example, for weed control.³⁰ Frequent harrowing also provided a relatively good seed bed.³¹

Fall plowing was the norm across the Island, and with the lack of cover crops, erosion was a constant threat, although smaller fields tended to lessen erosion problems. Others have moved to less cultivation on their land.³² More attention is also being revived in the importance of the top few inches of the soil.³³

The timing of cultivation was also a factor. Some farmers believed that cultivating too early encouraged weed propagation.³⁴ Others would not begin cultivating until they were able to squeeze a ball of soil in their hands and have it crumble; if it stuck together, it was considered too early.³⁵ Another farmer had a more novel approach: he would not begin cultivating until he saw dust from the horses' hooves.³⁶ According to another, "It makes a difference if you get on the land too soon."³⁷

The practice of picking stones off the land was also questioned. The belief was expressed that small stones in the soil serve the useful function of holding moisture, preventing compaction and maintaining porosity.³⁸ In this regard, it was also felt that earthworms are "the most necessary

thing in the soil" in that they contribute to deepening and mixing soil.³⁹ The destruction of earthworms (by chemicals) has been deplored,⁴⁰ and the presence of worms is regarded as a good indicator of soil conditions: "If you don't have earthworms, your soil is not working."⁴¹

[>>>top](#)

Fertilization

If traditional, sustainable agriculture rested on one thing, that was manure -- lots of manure, although there was never enough. Versatile and highly valued, manure "could be used anytime at all."⁴² It was believed that manure was the only way for the soil to maintain its "tilth."⁴³ Manure was central to the entire farming system: "rotation, manure and hedgerows, particularly in this country, were very important."⁴⁴

Although most farmers used whatever manure they had, it was customary to manure the potato crop at the beginning of a rotation. The Experimental Farm carried out fertility studies with manure on several of its Illustration Stations for over 22 years, and concluded that "the effect of manure is very beneficial."⁴⁵ Manured areas promoted longer growth periods in crops than in areas where manure was absent.⁴⁶ The benefits of manure for crop health, soil conditioning and yields were universally accepted.

The only problem with manure is that there was never enough of it. Many farmers turned to other natural fertilizers to supplement their manure. One of the more common was seaweed or kelp. It was sometimes used as a bedding⁴⁷ or composted with the manure pile. Such compost was described as being "very good for the soil."⁴⁸ In particular, kelp was considered to be excellent for potato production. One farmer stated that he'd seen "just as good a crop from kelp as they ever grew with fertilization."⁴⁹ Gathered from the shore, kelp was piled in the fields and, after some decaying, was spread early in the spring. Some farmers claimed that, perhaps because of trace elements in seaweed, there were fewer weed problems.⁵⁰ It was also claimed that seaweed resulted in "a good clean crop of potatoes."⁵¹

[>>>top](#)

In addition to seaweed, farmers also made extensive use of other products from the sea. Lobster shells in particular were widely used (although they had to be plowed down quickly before attracting too many crows!). Because they were high in potash, their use was avoided on potato ground, but they were considered excellent for turnip production.⁵² Others observed that grain tended to lodge (fall over) if there was an excess residue of lobster shells in the soil.⁵³

Whenever possible or practical, farmers would supplement their fertility requirements as best they could. Herring was sometimes used to grow potatoes,⁵⁴ either by spreading it directly on the field or planting it between the sets. Some farmers maintained the use of herring resulted in great crops with no scab.⁵⁵

Whatever the source, the application of organic matter to the soil was considered crucial. From 10-20 tons per acre of manure would be applied and plowed under; it was seen as the source, not

only of organic matter, but also of critical trace elements. Very little "green manure" (crops, such as rye grass or buckwheat, grown and plowed under) was used, but with the proper rotation practices, sods were plowed under: "The rotten sod is tremendous."⁵⁶

If manure was the fertilizer of choice, then mussel mud for many years was practically the only source of lime. Dug from rich mussel or oyster beds all around the Island, its effects were both immediate and long-lasting, even to this day. The shells slowly decomposed in the fields and added vital nutrients to the soil. Gradually, whole farms were "mudded" and mussel mud was considered indispensable.

Testimonials to the efficacy of mussel mud are universal. One farmer "often wondered how farmers found out there was this rich mud."⁵⁷ It was "wonderful stuff."⁵⁸ It was also believed to contain trace elements "that suited the soil."⁵⁹ It was especially effective on crops like clover.⁶⁰ Many considered mussel mud "way better than lime."⁶¹ Not only was it long lasting, but also one application appeared to be sufficient' it was applied up to 15 tons per acre.⁶²

The major disadvantage in using mussel mud, however, was that it tended to cause scab in potatoes. Some fields were entirely avoided for potato production.⁶³ One explanation for this, however, is that it is of the mud itself which caused scabs but rather the presence of a scab organism in the soil which was activated by changes in the pH level.⁶⁴

Certainly the use of mussel mud was considered essential to maintaining a satisfactory balance in the soil. "That was the theory of the older people."⁶⁵ Where mussel mud was not readily available, many farmers dug "back mud" from the swamps. Often mixed with manure, the black mud was spread on the land and was also used on potato land.⁶⁶ Often it was also composted with manure in alternating layers and applied on root crops.⁶⁷

Digging and spreading mussel mud was very demanding of time and energy, and its use was quickly abandoned when limestone became more readily available. The early form of quarried limestone required burning in a kiln or slaking on the ground, but it was regarded as more convenient than and not necessarily superior to mussel mud. In fact, had more effective means been available for obtaining and applying mussel mud, its use on Island soils may have continued because of its many perceived qualities and advantages. Farmers relied almost exclusively on local sources for organic fertilizers. An exception was the use of guano, high in nitrogen, which was imported from South American. The use of guano was never widespread on the Island.⁶⁸

The move to chemical fertilizers took place gradually. The earliest common fertilizer was known as superphosphates, which was mixed with manure, and applied relatively lightly. Different ingredients also came to be used: potash, superphosphates and nitrogen, and mixed by the farmer himself in varying proportions. A great deal of work was carried out to find the best mixture for varying soils and crops: 3-6-9, 8-12-16, 5-10-15, 5-10-10, 6-12-12, 6-8-8 and so on. The adoption of these chemicals was generally regarded as a sign of progress. With shortages in "natural" fertilizers, they resulted in better yields with less labour, and were generally embraced by the Island farm population. When these were accompanied by the introduction of ground

limestone, farmers generally anticipated their age-old struggle to develop and maintain soil fertility had ended.

There was some note, however, of changes in the land and in crops. Some farmers noted an increased incidence of weeds.⁶⁹ Others noted, for example, new problems such as brown heart in turnips.⁷⁰ This led to the introduction of new inputs, such as borax.⁷¹ Others maintained that fertilizers should only be used as a supplement to manures, and that fertilizers themselves produce no lasting effects.⁷² Many farmers suggested the potentially destructive effects of fertilizers on humus, the need for ever-increasing amounts of limestone, the loss of trace elements and organic material. As one said, "A true ecological system will work for you; you don't have to supply any of these nutrients."⁷³

[>>>top](#)

Weed control

The overwhelming majority of traditional farmers in Prince Edward Island agree that weeds were not considered a big problem. Where they existed, they were controlled by cultivation, hoeing or pulling by hand. Although there were, as now, some common weeds -- sow thistle, wild mustard (wild radish), lamb's quarters, daisies, in hay fields was so limited they could be pulled out by hand. It was believed that longer rotations had the effect of keeping weeds under control, and where patches of sow thistle, for example, occurred, they could be easily eliminated by cutting.⁷⁴

Successful weed control was synonymous with good farming: "It was a symbol of laziness if there was a grain of mustard left there [in the field]."⁷⁵ Good farmers took pride in weed control and practised it diligently and constantly.

Traditionally, no one thought of spraying to control weeds. Different cultivation practices were employed. Some would plow early in the fall to expose the seeds to sunlight.⁷⁶ Frequent cultivating in the spring, even after the grain crop had emerged, would eliminate weeds: "It makes a difference if you get on the land too soon."⁷⁷ Others would clip pastures before weeds went to seed.⁷⁸

Increasing weed problems are attributed to a number of factors. When grain was cut with the binder, the weeds were physically removed from the fields. Early combines had a scour cleaner which would separate the weeds from the grain. In all cases, care would be taken to destroy the weed seeds. Weed control, in effect, was largely mechanical.

On potatoes, frequent scuffling and hilling controlled weeds until they were choked out by the potato tops. Couch grass was removed or broken up mechanically, and buckwheat plowed under was claimed as an effective method for alleviating couch problems.

There is general agreement that weeds today are much more of a problem, and some of the blame is believed to be attached to the increased use of fertilizers and to soil degradation. "I don't remember too many weeds in the grain until we got using more fertilizer and the ground got built up, I suppose, richer and then the weeds came...."⁷⁹ Said another: "Sick soil causes weeds."⁸⁰

[>>>top](#)

Insect and Fungus Control

The one insect problem most commonly identified in Island agriculture is the Colorado Potato Beetle, and the one method used to control it by traditional means is Paris Green. While the potato beetles were originally either picked or beaten off the potato plants, it was the introduction of the poison Paris Green (cupric acetoarsenite) that marked the first effective steps for their control. Application methods, however, were primitive. Shaken on the leaf from a can, mounted on a hoop and dusted, and later sprayed on from the back of a horse and cart with a hand pump, the application of this insecticide was sporadic at best, although claims to its relative effectiveness were advanced by most farmers. Few farmers were aware of the possible dangerous consequences of these early chemicals.

Blight was controlled by a substance known as bluestone. To prevent burning the tips, it was mixed with lime in a mixture called 4-4-40 (four pounds bluestone, four pounds lime and 40 gallons of water). It was also regarded as effective in combatting blight.⁸¹ Another spray that was quite widely used was called a Bourdeau Mixture (eight pounds bluestone, four pounds lime and 100 gallons water).⁸²

Topkilling of potatoes was rarely carried out. With smaller acreages, farmers would simply allow the tops to be frost-killed or they were mechanically beaten off with a chain-like device. Some farmers used a light application of coarse salt to kill potato tops. As well, since potatoes were stored in cellars, they didn't have to be as "dead." Other potato diseases, such as mosaic, leaf roll, black leg, spindle tuber, and the like, were eliminated by roguing (pulling by hand).⁸³

Another spray which was used in orchards was a product derived from the tobacco plant called nicotine-40 or Black Leaf 40. It was described as a very deadly poison, but highly effective on orchards.⁸⁴

In general, traditional Island agriculture employed very few chemicals. Some work was begun at the Experimental Farm on pyrethrums and natural predators,⁸⁵ but there is little evidence that farmers had much knowledge of these or of such practices as companion planting or natural inhibitors. With the widespread introduction and adoption of chemicals such as DDT, particularly after the Second World War, natural chemicals and mechanical methods were almost completely supplanted.

[>>>top](#)

Livestock

One of the most challenging aspects of traditional, sustainable agriculture across Prince Edward Island was the care and feeding of livestock. While practically every farm boasted milk and beef cattle, hogs, poultry, horses and sometimes sheep, animal husbandry practices were constant challenges to the farmer's ingenuity. At the same time, however, there were several prizewinning

herds and animals on the Island, and it is claimed that one Island farmer produced the first registered Leghorn hen in the world.⁸⁶

One of the major problems was lack of feed. Hay, straw and crushed grain were fed to cattle, sometimes with supplements, but because of a limited supply, and with the overwhelming necessity to keep horses well fed, the diets of cattle were "pretty thin in the spring of the year ... mostly it was a matter of bringing the cows through the winter alive."⁸⁷ One farmer noted that they considered it lucky to get cattle out over the doorstep in the spring.⁸⁸ Indeed, there was some skepticism about the introduction of larger breeds, such as Holsteins, because farmers feared it would be too hard to get them to their feet after the winter.⁸⁹ Getting cattle to pasture was a matter of "swinging feet after the winter. Getting cattle to pasture was a matter of "winging them by their tails ... years back people didn't understand the protein requirements or nutrition ... the general consensus was a full belly should suffice."⁹⁰

The basic diet of cattle, in addition to hay and pasture, was grain (oats and barley) supplemented by turnips, mangels, sometimes kale and vetches, and other supplements such as fish meal, linseed oil, bran (considered important for milk production) and salt. Poultry was given a standard ration of grain, occasionally supplemented with buttermilk.⁹¹ Before the introduction of poultry rations, some farmers baked cakes for feeding from corn meal and eggs.⁹² Pigs were fed grain, skim milk and many farms had a "boilerhouse" where potatoes were boiled in a mash with grain. When sows were nursing their litters, some farmers increased the ration of bran; "they were great believers at nursing time to feed considerable bran."⁹³

A common practice in early time was the feeding of "green sheaves" of grain to cattle. While not assigned a high value as feed, it was done through a combination of convenience and necessity.

Black oats was particularly valued as feed for horses. Generally, horses were the best-fed animals on the farm, and timothy hay (no clover) was first reserved for them. A potato or two every night was considered a good laxative, and wheat or scalded bran was considered good for digestive problems.⁹⁴ One farmer considered wild radish (wild turnip) as having a beneficial effect on horses.⁹⁵

With some exceptions, cattle were rarely milked year-round and feeding was directly related to milk production. Cows produced on average 40-60 pounds of milk per day during peak production. While pigs generally took longer than at the present time to grow to market weight, there appears to be little change in such areas as litter size, survival rates and so forth.

Treatment of diseases was minimal. Many areas of the province had a local "horse doctor," someone who was considered too much of a problem in the early days, perhaps because animals were not overfed, and were milked by hand. There were few known cures other than perhaps bathing udders with hot water for long periods of time; "that was mainly what they would be doing."⁹⁶ Scours in pigs was believed to result from an iron deficiency and some farmers used a form of dry iron at first.⁹⁷ In calves, some older farmers treated scours with a mixture of flour and water.⁹⁸ Horses with heaves were treated with a combination of damp hay and sometimes molasses.⁹⁹ One farmer recalls his father had a practice of bleeding a bucket of blood from a

horse for certain sicknesses.¹⁰⁰ Another recalls a local "horse doctor" effectively using bichloride of mercury for treating boils, as well as for some other problems.¹⁰¹

In general, animal diseases were considered symptoms of dietary deficiencies, whether protein, mineral or whatever. Considerable success in dealing with some problems, such as toxic mastitis, was reported by one man who attributed a balanced diet with feed supplements to alleviating the condition: "The vets figured we had a little bit of something else going for us and I think our ecological approach had to be it."¹⁰²

The treatment of animal disease did not advance significantly until the practice of veterinary medicine spread across the province. Some farmers also had taken short courses in veterinary medicine and were regularly called on by neighbours to assist at calving and other times.¹⁰³

Other advances in caring for livestock, such as the introduction of farrowing crates, were regarded as beneficial.¹⁰⁴ With sometimes poor housing, ventilation, temperature controls, diets and the like, the general view is that animal husbandry has greatly improved in recent years. Herd improvement was considered to be increasingly vital. In early times, farmers were highly vulnerable to disease infestations and were often ill-equipped to deal with them.¹⁰⁵ Although many farmers had excellent livestock herds, animal husbandry, according to one "was a rugged way of life."¹⁰⁶

[>>>top](#)

Farm Organization

In general, farmers learned from one another. There was a great deal of sharing of information, ideas and manpower and equipment. Peer pressure brought about a great many improvements. While there were good farmers and poor farmers, it was considered that traditional farmers possessed a great deal of wisdom: "Farmers in those days perhaps didn't have a lot of formal education but they were very wise people. They knew an awful lot of things that they just acquired as they grew up. They certainly didn't get it through a formal education but they know an awful lot of things that perhaps some of us don't know today."¹⁰⁷ In many cases, the generation of farmers of the early to mid-1900s were the beneficiaries of a more ancient wisdom which they may not have understood as well. Referring to some old methods, practices and beliefs, one commented that these were "just the things my grandparents were doing."¹⁰⁸

Formal extension efforts in the early days were primarily the responsibility of the Experimental Farm. Through the work of its Illustration Stations, one-on-one contacts and its Field Days (often great social events as well), a great deal of information was disseminated.¹⁰⁹ The work of farm organizations, such as the Farmers' Institutes, marketing co-ops and later the Federation of Agriculture, was directed to education, marketing and lobbying.¹¹⁰ The early work of the Women's Institutes was regarded as important in terms of such issues as farm and family health.¹¹¹ Earlier organizations, such as the Boys' and Girls' Clubs, served as effective means of educating younger, prospective farmers in the science of agriculture.¹¹² Events, such as exhibitions and school fairs, were also intended to inspire and encourage improved agricultural methods. Co-operation more generally extended to all aspects of farm life. In some areas, even

machinery co-ops were established and, with a relatively limited land base, rotation was better assured with the sharing of land among farmers.¹¹³

It was not until after the Second World War that the Provincial Department of Agriculture mounted concerted extension efforts. At the same time, the increased involvement of specialists such as potato inspectors encouraged the adoption of more scientific practices. The general impression of traditional farmers was that traditional agriculture was not all that scientific. One echoed the sentiment of the farm community: "If [the Experimental Farm] did nothing more than give us a reason for many of the things we were doing, then they're worth their money."¹¹⁴ Science and tradition appeared to co-exist easily.

There was, however, very little in the way of record keeping. Aside from some use of records of production and the like, farmers kept few records. "The bank was my record" according to one.¹¹⁵ There was generally a greater intimacy with the land and with cattle; people carried records around in their heads; "Farmers knew the potential of every field on their farm."¹¹⁶ One reported that his father kept his records of farming activity on the barn door, and with the old barn gone, the farm record disappeared: "I always thought we should have saved that door."¹¹⁷

[>>>top](#)

Fruit Crops

Practically every farm across Prince Edward Island had at least some fruit trees. They had generally been established before 1900, and produced apples, pears, plums and cherries. One estimate is that around the turn of the century, somewhere between four and five thousand acres were under cultivation in fruit trees, and at that time during an exposition in Paris, an Island apple was awarded first prize in its category.¹¹⁸ "The generation older than me," said one, "all had beautiful apple orchards. That was just routine. Every farmer had an apple orchard, anywhere from ten to twenty-five trees."¹¹⁹

Orchards required a great deal of work to establish and maintain. Pruning was an intensive task, and there were a number of itinerant tree pruners who toured the province.¹²⁰ Spraying was done with nicotine sulphate or Blackleaf 40, a powerful poison derived from the tobacco plant.¹²¹ Many of the older farmers do not recall major problems with scab or worms on apples. One believed that the practice of grazing animals such as pigs in the orchards, who would eat the windfalls, helped keep the apple maggot under control.¹²² Spraying with copper sulphate helped control scab.¹²³ Some people would place seaweed around apple trees in the spring as a fertilizer.¹²⁴ One farmer reported that his grandmother had a practice of digging in pieces of scrap iron (old plow shears, hoops or whatever) around the roots of the trees.¹²⁵

If there were disease problems in fruit trees, they were not pronounced until after the first quarter of the century. The spread of fungus, the development of black knot in cherry trees, and increasing neglect took their toll on orchards. Apples were increasingly infested with worms and trees with insects, which had theretofore been practically non-existent. "A lot of things happened in the 1930s" and the demise of orchards was accelerated.¹²⁶

[>>>top](#)

Folklore Traditions and Folkways

Folklore was regarded by farmers in one of three ways: beliefs which shaped the practices of an older generation; beliefs which they tried to incorporate when they could; or the subject was ignored entirely. "A few people had ideas" about folklore, said one.¹²⁷ Another commented about the application of certain traditions: "No, we didn't, but we knew about it."¹²⁸ Said another, "You tried to do it."¹²⁹ "The older people had more knowledge than they have today," another farmer commented.¹³⁰ "The older people were full of that," said another, and added that he tried to follow certain conventions "just in case" there was anything to it.¹³¹

The moon was considered to be the major influence on crops and the phases of the moon served as a planting guide. "The moon controls the earth and everything that's on it," claimed one farmer.¹³² In general, crops which produced above ground, such as cucumbers and pumpkins, were planted in the dark phase of the moon in June; otherwise, they would produce too many blossoms.¹³³ It was believed that potatoes should be planted in the dark of the moon in May.¹³⁴ Grain was sowed by the light of the moon.¹³⁵

The moon also served as a guide for killing pigs. Pigs were killed in the dark of the moon; the resulting pork would not shrivel nearly as much as the pork from a pig killed in "the growing of the moon."¹³⁶ Wood was also cut in the dark of the moon.¹³⁷ If cut in the dark of the moon, it was easier to peel the bark off longers (fence rails) and firewood was easier to split.¹³⁸ The moon also served as an aid in weather forecasting.¹³⁹ Its location in the sky, position and whether it was "dry" or "wet" served as basic indicators of forthcoming weather conditions.

There were a number of other conventional beliefs. A spring snow was regarded as beneficial because of the number of trace elements and increased levels of nitrogen which accompanied it. (This snow was also regarded as good medicine for eyes.¹⁴⁰) Lightning was regarded as beneficial because of the nitrogen it released. Thistles would be moved according to certain phases of the moon because they would be more effectively eradicated.¹⁴¹ The east wind was not welcomed at planting time because it was a harbinger of cool, damp weather. Someone reported his neighbour never planted grain until the arrival of the swallows.¹⁴² Green Christmases, sheep storms and January thaws all had their place in the cycle of the seasons and the beliefs associated with them.

There were some other practices of unknown origin. One of these was "roping the grain," whereby a length of rope was dragged by two people across a grain field to control rust.¹⁴³ Dishwater was poured over gardens as insect control, and was considered effective against earwigs.¹⁴⁴ Some people were noted for their ability to locate wells; such people were distinguished with "a crown in their thumb."¹⁴⁵ Some people would also cut potato sets before a full moon.¹⁴⁶ Others maintained that putting potato sets out in the sun for a few days was beneficial; "they always claimed it gave them a few days advantage."¹⁴⁷ There were also cures and tonics for a variety of animal diseases. Scours, for example, was treated with a tea or drench made from the inner bark of a birch tree.¹⁴⁸

Certain weeds were used as indicators of soil conditions. The presence of sorrel, corn spurry or ox-eye daisy was evidence of an acidic soil. White clover was indicative of a good, sweet soil.

Central to these beliefs and practices was a sense that natural forces were important: "Every time we move further away [from nature] the more we get in trouble."¹⁴⁹

[>>>top](#)

The Introduction of Chemicals

The use of chemical fertilizers, insecticides, pesticides and fungicides was extremely limited on Island farms until after the Second World War. Fertilizer ingredients were imported in raw form and mixed on the farm. Paris Green and bluestone were the common spray materials. Weed control was accomplished by mechanical methods. The introduction of chemicals, and their widespread adoption by farmers, revolutionized the agriculture industry across Prince Edward Island.

Chemical inputs were welcomed as labour-saving, and effective, and held the promise of higher crop yields and quality. Chemical inputs "were pushed as miracles, and they really were in a way."¹⁵⁰ The adoption of chemicals was "considered the sign of a progressive farmer."¹⁵¹ In general terms, there was little overall concern about the effects of chemical inputs.¹⁵² Some farmers, for example, believed DDT safe enough to drink, and there was a broad range of abuses stemming from the early use of such chemicals.¹⁵³

Although there had been some early work on natural controls conducted at the Experimental Farm during the 1930s, it was generally acknowledged that the promotion of chemicals after the Second World War was spearheaded by government and the chemical companies, and the interest in natural, ecological methods declined. "The generation of farmers after 1950 seemed to lose the grasp that one natural phenomenon or one thing in nature might take care of another. They had to buy it in a package."¹⁵⁴

A number of farmers, nonetheless, maintained reservations about widespread chemical use. Many used chemicals in limited quantities, or stuck to older methods; "I thought that was a lot better than polluting the land."¹⁵⁵ Others observed that "we did get more results from lesser amounts of fertilizer."¹⁵⁶ There is also a sense that the use of chemicals was accompanied by newer, larger problems. Recalls one, "We didn't seem to have so much trouble with weeds then" and certain problems, such as brown heart, and an increase in insect populations became evident: "All these things got worse as time went on."¹⁵⁷

Others maintained much more skepticism. Referring to the widespread promotion, and subsequent adoption, of chemicals, one farmer stated: "I've changed my mind about chemicals now.... Chemicals are poison."¹⁵⁸ One farmer recalls the warning given to his father by the local doctor about the use of chemical fertilizers; he warned that chemicals, once they got in the soil, would become part of the food chain and lead to increased levels of heart attacks, cancer and other health risks.¹⁵⁹ Others have noted the loss of wildlife, such as bees, wasps and birds, and the reduced levels of worms in the soil, as indicative of the destructive effects of chemical use;

"Farmers were more careful than they are today... there's something going on that our bird life is disappearing."¹⁶⁰ Some believe that chemicals are destroying soil conditions, organisms, humus, and creating more problems than they solve: "Sick soil causes weeds."¹⁶¹ Others suggest that changes in farming patterns, such as infestations.¹⁶² Practically everyone agrees that chemicals have brought about major transformations; "All the new technology they've got, it's ruining the earth really, and the soil is so badly corrupt now with chemicals it's going to take nature a long time to heal that."¹⁶³

Many older farmers embraced the use of chemicals and present agricultural methods are largely based on chemical inputs. Many of those in the industry believe that the problems with chemicals arise from their abuse, not from their use.¹⁶⁴ Others remain unconvinced: "Farmers don't understand what's happening."¹⁶⁵

[>>>top](#)

Mixed Farming

Perhaps one of the most important factors in the success of traditional and sustainable agriculture in Prince Edward Island was the pattern of farming itself, and that pattern was based on mixed farming. The mixed farm resulted in a diversity of crops and manure for fertilizer, and provided for rotation practices considered important, not only for soil health, but also for weed and insect control. Admittedly, there were some drawbacks in farming, but maintaining proper soils was regarded as important. Referring to farming methods to maintain the soil, one observed: "To me it says that farm will be there for generation after generation after generation... not degraded but sustainable. It comes back to the use of that land."¹⁶⁶ There is a general impression that mixed farming was a vital component of traditional, sustainable. It comes back to the use of that land." There is a general impression that mixed farming was a vital component of traditional, sustainable agriculture; it was considered "pretty hard for to beat mixed farming in this country."¹⁶⁷

Indeed, the size, scope and nature of farms is seen not simply in terms of farm operations but also in economic and political terms. "If there's any salvation to save the small family farm, I think this is the way to go."¹⁶⁸ While it has not been the intent or purpose of this report to reach any conclusions or to formulate any recommendations, it might be observed that the traditional model of mixed farms should be taken into account in the future of a sustainable agricultural industry.

[>>>top](#)

Conclusion

By the end of the 1980s, the nature of Island agriculture had undergone profound and revolutionary changes from the 1950s. The number of farms had declined to just under 3000 and the average size had more than doubled from a generation earlier. Yet, these numbers obscure another important fact: the number of commercial farms, those with revenue of \$ 25,000 and higher, actually numbered around 1,400, one-half the total number of farms. Agriculture on

Prince Edward Island is now dominated by larger, more specialized operations; one-half the number of total farms account for more than three-quarters of the land under production.

At the same time, an even more profound – perhaps revolutionary – change has taken place. Agriculture, up to the 1950s, was essentially based on traditional methods, methods which had been followed by generations of farmers. The widespread introduction of chemicals marked a significant break with the past, and exerted a major change on the way farming was carried out. Agriculture after the Second World War was at a crossroads between the continued development of biological and ecological approaches on the one hand, and chemicals on the other.

[>>>top](#)

APPENDIX 1

INTERVIEW SUMMARIES

People who were interviewed:

Raymond Acorn

David Ling

Augustine Arsenault

Norman MacDonald

Earl Ballem

William MacDonald

Claude Barrett

Douglas MacFarlane

Norman Black

J.B. MacIsaac

Lyall Boswall

Bruce MacLaren

Austin Bowman

Raynal MacNeill

Amy Campbell

Charlie MacNevin

Gordon Carver

Ernest MacPhee

John A. Cheverie

Percy MacPherson

Brent Currie

Bob MacRae

Zeno Gallant

Leo McIsaac

Neil Garrett

Tom Murphy

Ralph Gay

Alton Raynor

Gerald Handrahan	Earl Richards
Everett and Betty Howatt	Eric Robinson
Arthur Hughes	Wilfred Shaw
Emmert Hughes	Don Stewart
Ruby Jay	Lloyd Wilkie
William Johnston	Johnny Wilson
Charles and Frances Jones	Preston Wood

Copies of tapes have been deposited at the Provincial Archives and at the Robertson Library, University of Prince Edward Island.

Raymond Acorn

Born in Dundas, 1921. Raised on, and operated, mixed farm. Active in dairy and hogs.

Topics covered

- description of early farming practices and beliefs
- sources of fertilizer, including seaweed, mussel mud, black mud and lobster bodies
- cultivation and weed control
- crop yields and varieties
- harvesting methods
- introduction of fertilizers and chemicals
- animal feeding
- treatment of animal diseases
- some folklore traditions

Augustine Arsenault

Born 1908 in Egmont Bay. Mixed farmer and fisherman. Descendant of early Acadians.

Topics covered

- early farming practices in region
- composting methods
- objections re use of chemicals
- weed and insect control
- discussion of cultivation practices
- use of lobster shells and herring for crop production
- description of use of field tiles

Earl Ballem

Born 1901, Crossroads. Took over operation of mixed farm.

Topics covered

- description of early life on farm
- digging and use of mussel mud
- rotation methods
- weed and insect control
- livestock feeding practices
- milk production
- effects of mechanization

Claude Barrett

Born on farm in St. Eleanors, 1920. Farmed with father, later started on own in Springfield, 1953. Mixed farmer, with specialization in hogs and dairy.

Topics covered

- description of early farming practices (rotation, fertilization)
- grain production methods (cultivation and weed control)
- control of insects on livestock
- grain and forage production practices
- insect control on potatoes
- swine production and feeding
- changes in insect and bird populations

[>>>top](#)

Norman Black

Born on a farm in the Sussex area of New Brunswick. Trained as agricultural scientist. Came to P.E.I. Experimental Farm in 1940. Worked on forage crops and involved in operation of a number of Illustration Stations across the Island.

Topics covered

- early work on increasing yields, chiefly through fertility trials
- use of seaweed
- description of various fertility studies
- mechanical methods of weed control
- drawbacks of corn production
- importance of organic matter
- description of trials on permanent pastures
- P.E.I. soil types and cultivation practices
- early work on lupins, alfalfa
- discussion of yields under varying circumstances

- importance of trace elements

Lyll Boswall

Born and raised on Tulloch Farm, Marshfield. Took over in 1951, operated mixed farm (cattle, sheep and hogs). Major livestock exhibitor.

Topics covered

- description of early farm
- manure and mussel mud as fertilizer
- rotation practices
- lack of weeds in early days (also relatively blight-free)
- cultivation practices
- use of seaweed for bedding
- introduction of new plant varieties/chemicals
- two-row vs. six-row barley production

Austin Bowman

Born North Wiltshire, 1931. Farmed until 1960. Went on to Cornell University (Ph.D. in agriculture).

Topics covered

- description of farm where grew up
- animal breeding practices
- fertilization, weed control and rotation practices
- treatment of pests in animals
- feeding practices
- technological changes in agriculture (mechanization, introduction of chemicals, attitudes of farmers)
- rotation and land use
- importance of soil management
- lengthy description of early farm machinery
- early beliefs re moon, thunderstorms, weather forecasting

Amy Campbell

Former schoolteacher and farm wife. Active on mixed farm in Fortune with husband.

Topics covered

- description of farm life, practices and production
- early potato production methods
- use of manure and seaweed
- weed control methods
- feeding practices

- rotation methods

[>>>top](#)

Gordon Carver

Born on family farm in Hazelbrook, 1991. Farmed there all his life. Mainly mixed farming operation.

Topics covered

- description of early days in farming
- varieties/yields of crops
- introduction of fertilizers to improve yields
- rotation methods
- cultivation practices
- development of greater incidences of blight
- description of poultry hatchery operation
- feeding/care of animals
- some folklore traditions
- weed control and introduction of herbicides
- description of farrow to finish operation

John A. Cheverie

Born East Point, 1921. Raised on family farm, and took over from father.

Topics covered

- description of early farm (crops, livestock)
- production of oats (white and black)
- use of manure, seaweed, kelp and lobster shells
- potato production methods
- livestock feeding
- rotation practices
- description of weeds and control methods
- effects of salt spray on crops

Brent Currie

Born Fairview, 1914. Third generation on family farm. Mixed farmer for 40 years.

Topics covered

- rotation practices
- advantages of mussel mud, especially on new land
- grain production methods and early varieties
- benefits of plowing sod
- sentiments re use of chemicals

- crop production methods and weed control
- insect control
- livestock feeding
- overuse of land
- poultry production methods and disease control

Zeno Gallant

Farmed in Urbanville since 1937. Operated Illustration Station for the Experimental Farm; field trials in pasture, grain and potato production. Mixed farmer.

Topics covered

- description of farm, crops, animals
- rotation practices (including sharing of land among farmers)
- early use of fertilizers and chemicals
- effects of mussel mud
- composting techniques
- sources of information

Neil Garrett

Born in 1911 in Forest Hill. Raised on and operated mixed family farm. Farmed 45 years, mostly without chemical inputs.

Topics covered

- description of early farm (acreage, crops, animals)
- rotation and fertilization methods
- early potato production methods, diseases, control techniques
- animal feeding

Ralph Gay

Born in O'Leary area, 1911. Worked in butter factory, then farm hand in Ontario. After the Second World War, started dairy farm in Winsloe.

Topics covered

- description of early farm life in West Prince
- experience on "modern" Ontario farm
- development of dairy business in Winsloe
- use of nitrogen to improve hay crop
- description of composting manure
- benefits of poultry manure to alleviate wire grass
- introduction of mechanization, effect on crops and weeds
- use of buckwheat as soil conditioner
- livestock feeding practices
- description and benefits of short course in veterinary medicine

Gerald Handrahan

Born 1910, Tignish. Took over family farm. Active in community organizations.

Topics covered

- rotations, yields and varieties of crops
- weed and insect control
- fertilization practices, including mussel mud and lobster shells
- cultivation practices
- potato production methods
- seed selection

[>>>top](#)

Everett and Betty Howatt

Everett born in Tryon, Betty in Charlottetown, 1920s. Tryon farm in Howatt family since 1783. Specialized in fruit and vegetable production.

Topics covered

- discussion of early family poultry hatchery operation; care and feeding practices
- establishment of orchards and disease control
- rotation and use of green manure
- early use of mussel mud and seaweed
- transition in land use practices and production patterns
- monoculture, insects and weeds
- weeds as indicators
- vegetable crop production practices
- orchard spraying
- discussion re ecological practices
- orchard spraying
- discussion re ecological practices
- some folklore traditions and their origins
- sentiment re chemical use
- early utilization of marsh hay
- addition of organic matter to soils
- cultivation practices
- natural production methods

Arthur Hughes

Born in 1917 in Bedford. Farmed there all his life. Mixed farmer.

Topics covered

- soil management policies
- harmful effects of sprays

- importance of livestock production in P.E.I.
- Description of soil rotation practices
- importance of manure to soils
- trace elements in mussel mud
- benefits of lobster shells in turnip production
- timing of cultivation, planting
- mechanical methods for control of couch
- importance of worms in soil
- description of early potato varieties, cultivation methods, weed and pest control
- care of orchards
- early condition of livestock
- early erosion control methods

[>>>top](#)

Emmert Hughes

Born 1921, Donagh. Farmed on own since 1946. Some specialization in strawberries.

Topics covered

- fertilization practices
- use of black mud
- insect and weed control
- strawberry production methods
- some folklore traditions

Ruby Jay

Born and raised in Mt. Stewart area on family farm.

Topics covered

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- active recollection of folklore traditions related to agriculture
- the moon and weather forecasting
- planting crops by phases of the moon
- slaughtering animals by phases of the moon
- cutting potato sets before full moon
- food preservation techniques
- role of farm women
- treatment of animal diseases and complications

William Johnston

Born in Long River, 1892. Farmed from the age of 13-14. Later operated Illustration Station for Experimental Farm. Considered to be very progressive farmer.

Topics covered

- rotation practices, crop varieties
- early use of fertilizer, mussel mud and manure
- aimed at eradication of weeds
- anecdotes re cattle buying, credit practices
- development of mechanization
- livestock feeding practices
- use of permanent pastures
- limited use of insecticides and herbicides
- early experiments with corn production
- activities with Farmers' Institute

Charles and Frances Jones

Operate family farm in Pownal. Charles born there in 1921; Frances born and raised on family farm in Uigg. Active in farm organizations.

Topics covered

- wheat production
- use of mussel mud
- crop rotation practices
- introduction of mixed fertilizers
- early work of boys' and girls' clubs, Farmers' Institute, exhibitions, buying clubs
- feed production (mangles, corn, kale, vetches)
- development of oats production
- weed control, cultivation and seed bed preparation
- changes in cultivation techniques
- importance of soil tilth
- care of orchards
- introduction of chemicals
- work of agricultural organizations

David Ling

Started farming, North Winsloe in 1970. Mid 1980s, switched to ecological/sustainable agriculture. Offered lots of practical advice on how and why he made the switch.

Topics covered

- farming methods with "conventional" practices
- why switched to ecological/sustainable methods
- effects on soil with sustainable methods, sources of fertility, green crops, cultivation
- mechanical methods of weed control
- composting techniques
- importance of humus
- strip grazing methods
- mixed farming and ecological agriculture

[>>>top](#)

Norman MacDonald

Born 1903 in Glen Valley. Third generation on family farm (established 1832). Mixed farmer.

Topics covered

- description of early life on farm
- crop rotation practices, varieties
- livestock production
- use of buckwheat
- fertilization (quantities and uses)
- weed and insect control
- conditions for healthy soil
- livestock feeding

William MacDonald

Born on family farm, North Lake, 1925. Took over farm after the Second World War. Good recollection of early agricultural methods.

Topics covered

- description of early farm life
- importance of rotation
- use of manure and composting
- sentiment re introduction of chemical fertilizers
- weed and insect control methods
- livestock feeding practices
- care of orchards
- early treatment of livestock disorders
- folklore traditions and practices

Douglas MacFarlane

Born and raised on family farm, Salutation Cove, near Bedeque. Now mainly livestock operation (dairy and beef).

Topics covered

- benefits of long (eight-year) rotation
- development of pastures (grasses and perennial legumes)
- heavy reliance on manure
- cultivation methods
- weed control (clipping)
- use of mussel mud on farms
- livestock feeding practices, benefits of supplements as disease control
- early work of "horse doctors"

- importance of ecological agriculture
- benefits of seaweed
- control of scabs in orchards

J.B. MacIsaac

Born Big Pond (near Priest Pond), 1922. Took over family farm. Mixed farm operation.

Topics covered

- description of early days on farm, with reference to seed potato production
- potato diseases and production problems
- manure and kelp as potato fertilizers
- rotation methods
- introduction of mixed grain
- weeds -- varieties and methods of control
- reference to development of browntop (long grass) industry in area
- control of insects in potatoes
- swine production methods
- ethnic differences in Island farming

Bruce MacLaren

Born on family farm, New Perth, 1910. Worked at Experimental Farm 1929-1970, mainly on cereal crops.

Topics covered

- description of early family farms (acreage, crop varieties, livestock production)
- farms as self-sufficient entities
- production and utilization of grain crops
- description of common weeds
- rotation practices (short vs. Long rotations)
- species of insects and insect control
- introduction of chemicals
- description of potato varieties and potato production methods
- fertilization practices
- effects of mussel mud and wood ashes
- role of agricultural extension
- early storage techniques
- some folklore traditions
- use of black oats

Raynall MacNeill

Born Mt. Royal in 1920. Started mixed farming as teenager. Later worked with Provincial Dept. Of Agriculture on soils and crops.

Topics covered

- description of early farm life
- fertilizer use and application, proportions mixed
- early use of chemicals
- crops, varieties and yields
- care and feeding of livestock
- cultivation practices and weed control
- rotation methods and importance of rotation
- seedbed preparations
- discussion of early "sustainable" practices
- cultivation practices
- weed control methods in potatoes
- pH conditions of soils
- sentiment re chemical use
- pasture production methods
- land use practices
- discussion of livestock feeding methods (lead feeding, rations, hay and grain, supplements) and importance of forages
- importance of soil organics

[>>>top](#)

Charlie MacNevin

Born Canoe Cove, 1925. Took over family farm as teenager. Generally farmed with traditional methods.

Topics covered

- description of early farm practices
- rotation methods and yield
- benefits of mixed farming
- fertilization practices
- treatment of potato sets
- weed control and cultivation practices
- potato production practices
- reservations about chemical inputs
- some folklore traditions

Ernest MacPhee

Born 1897 in Priest Road, fourth generation on farm. Started mixed farming as teenager.

Topics covered

- description of early farming practices
- grain production methods
- rotation practices
- use of fertilizers, manure, mussel mud for crops and kelp for potatoes

- application of mussel mud
- feeding of livestock, milk production
- benefits of grain binder
- weed and pest control in potatoes, varieties and yields
- turnip production
- some folklore traditions
- comments on land use, cultivation, soil management

Percy MacPherson

Born Glen William, 1913. Raised on family farm, operated on own since 1950.

Topics covered

- early production of grain, discussion of varieties and yields
- timing of cultivation for weed control
- some rotation practices
- use of lobster bodies on turnips
- insect control on potatoes
- development of weed problems
- cultivation practices
- livestock feeding
- control of diseases in cattle
- infestations of army worms and grasshoppers

Bob MacRae

Born in Waterside, 1911. Fourth generation on family farm.

Topics covered

- description of farm in early times
- grain varieties, yields, pest and weed control
- four-year rotation method
- cultivation practices
- use of mussel mud
- introduction of commercial fertilizers and effects
- care of orchids
- livestock feeding practices
- development of poultry production on farm
- introduction of mechanization, effect on crops and weeds

Leo McIsaac

Born in Earnscliffe, early 1920s. After the Second World War, worked with Provincial Department of Agriculture. Was machinery dealer and mixed farmer.

Topics covered

- extensive description of early farm life and practices
- importance of wildlife, insects, etc. as indicators
- importance of rotation methods
- early agricultural organizations
- marketing practices
- yields
- cultivation and weed control
- weeds as indicators
- discussion re introduction and use of chemicals
- use of mussel mud, seaweed and trace elements
- use of manure, applications
- care and feeding of horses and livestock
- dependence on chemicals
- early work of extension services
- changing economics of agriculture

Tom Murphy

Born in Cumberland, 1914. Raised on, and now operates, mixed farm.

Topics covered

- description of early days on farm
- varieties of grain for different feeds
- sources of fertilization
- description of lime kiln
- planting methods and production of potatoes
- sentiment re land use, rotation practices, soil conservation

Alton Raynor

Born in Cascumpec, in 1902. Raised on family farm. Became a potato inspector and for nine years involved in operation of the Elite Seed Farm.

Topics covered

- description of potato production, weed and disease control methods
- importance of seed in potato production
- description of potato diseases and treatments
- potato storage requirements
- discussion of potato varieties

Earl Richards

Born 1908. Farmed in Alberry Plains. Started farming on his own in 1933. Mixed farmer, cleared some of his own land.

Topics covered

- weed control
- animal feeding practices
- fertilization methods
- cultivation techniques

[>>>top](#)

Eric Robinson

Born 1918 in Augustine Cove. Raised on mixed farm. Became large potato producer in Albany.

Topics covered

- evolution of potato industry (production, storage and marketing)
- early methods of insect and blight control
- use of mixed fertilizers
- mechanical weed control
- causes of potato scabbing
- changes in rotation practices
- introduction of chemicals
- soil management practices
- changes in cultivation practices
- use of cover crops

Wilfred Shaw

Born in Campbellton, 1912. Farmed in Nine Mile Creek since 1942. Mixed farm.

Topics covered

- rotation practices
- sources of fertilizer (manure, kelp, mussel mud, green crops) and composting
- animal feeding practices
- varieties of grain
- potato production techniques
- cultivation and weed control, including preparation of seed bed
- effects of mechanization

Don Stewart

Born in Charlottetown in 1910. Graduate MacDonald College. Worked at Experimental Farm and later with Agriculture Canada as Inspector for "seeds, feeds, fertilizer, pesticides, and binder twine." Retired 1973.

Topics covered

- discussion re development of pesticides (Paris Green, bluestone, Blackleaf 40) in early days, to introduction of systemics
- attitudes re use of chemicals

- description of natural chemicals and pyrethrums, and early work on natural predators and natural inhibitors
- description of weeds as indicators of soil conditions
- early varieties and yields
- observations on crop rotations
- effects of boron deficiencies
- early use of mussel mud and development of the use of limestone
- discussion of early practices
- use of seaweed and kelp
- use of superphosphate and manure
- extension efforts of Experimental Farm
- description of development of fertilizers

Lloyd Wilkie

Born in Alberton, 1902. Started farming on his own in 1938. Mixed farmer.

Topics covered

- early varieties
- rotation methods and fertilization
- grain production, weed control
- care and feeding of animals
- evolution of potato production
- changes in insect populations

Johnny Wilson

Born in Glencoe, 1920, on family farm. Farmed in Alberry Plains since 1939. Mixed farm.

Topics covered

- early grain varieties
- treatment of rust and weeds
- composting methods
- weed and disease control
- rotation practices
- swine production methods
- livestock feeding
- development of farm mechanization
- spread of wild oats and mustard
- importance of hedgerows

Preston Wood

Born in Kinlock, 1906. Started farming on own 1931. Operated mixed farm and also kept foxes.

Topics covered

- description of farm
- rotation methods
- yields
- use of manure and introduction of fertilizer
- feeding methods for year-round milk production
- control of blight and insects on potatoes
- cultivation practices
- discussion on early days of fox industry
- use of buckwheat for alleviation of cooch
- use of green manure

[>>>top](#)

PART II

Selected Literature on Prince Edward Island Agriculture

An Annotated Bibliography

This report summarizes a consulting service to the Institute of Island Studies, University of Prince Edward Island, as part of the Institute's contract with the P.E.I. Department of Agriculture to evaluate the practicality of using traditional and sustainable farming methods in today's agriculture. The objective of the study as outlined in a working paper were reviewed with Mr. Harry of the study as outlined in a working paper were reviewed with Mr. Harry Baglolo of the Institute and with Mr. Wayne MacKinnon. The working paper set forth some of the particulars of earlier agricultural practices which were being sought.

This bibliography was compiled after a comprehensive review of available literature from the beginning of Island agriculture, and, while every effort was made to search all sources, it is inevitable that material was overlooked or not available for review.

[>>>top](#)

Methods

Books, pamphlets, manuscripts, government documents and reports, newspapers and films were examined at the major libraries, the public archives, the Media Centre and Le Musee Acadien in Prince Edward Island, followed by those at three institutional libraries and the public archives in Nova Scotia.

(For details see the "Key to Location Symbols" prefacing the bibliography.)

Excepting the Agriculture Canada Research Station library in Charlottetown where access to them where access to them was not available, card catalogues at each location were read under the appropriate subject heading, and works rejected or selected for further inspection according to information evident from the card content. Promising works (and many marginally

appropriate) were then obtained and scanned either in their entirety or as the table of contents indicated. Pertinent passages were read carefully and bibliographies scanned for additional references.

Results

The most productive sources for information on Island agriculture were the Confederation Centre Public Library, the Robertson Library at U.P.E.I., and the Government Services Library.

Although the references located in the Legislative Library at the Confederation Centre Public Library were few, they proved to be very informative. Elsewhere there were found few historical publications on earlier agriculture not already found in Island repositories. One significant collection in P.E.I. not examined was that of the Institute of Man and Resources because of its being in storage. However, many of its publications were reviewed at other locations. Other known publications of the Institute which were not available for review were included but not annotated.

Interpretation

Although by the terms of reference there was no requirement to assess the merits of the literature apart from estimating relevance, some degree of evaluation was necessary when determining usefulness. In selecting or rejecting material several criteria were employed. All located works on farming activities that influenced soil quality were included. Also examined and often included in the bibliography were works that appeared to be only marginally useful, but had some historic interest. Some publications post-1950 were also included because they treated early agriculture in general or were currently relevant. This latter was particularly true of the contemporary soil studies.

Comparatively little was written on the subject before 1870 and much of it simply repeated or elaborated on some earlier writing. Most of it was critical of the farmer's methods and attitudes, stressing his failure to manure the land adequately, to maintain buildings and equipment, to improve the care and feeding of his livestock, to improve his breeding stock, to keep them fenced, and to change his practice of long rotations of the cash crops of oats, hay and potatoes.

[>>>top](#)

Many of those writers were visitors or newly arrived immigrants from Britain and other provinces of Canada, where agriculture was well established and soils and climate often quite different from those of the Island. Seldom did they acknowledge that most who had settled here had little if any experience of farming and were obliged to learn by trial and error.

It became evident that the nutrients in the newly-opened and tilled land were quickly depleted through cropping. The initial amazement at the fertility and bounty of the soil changed to one of concern as yields diminished. From earliest times, the settler seemed aware that the soil needed

lime, and concern for soil fertility proved to be the dominant theme in the literature throughout the entire period examined.

Virtually all formal literature on Island agriculture during the 1800s has three serious faults. The first is that the farmer's voice was seldom heard; we never learn of his opinions, nor if he heeded what "expert" advice came his way. Second, there was constant criticism of what was wrong with farming practices of the time but little acknowledgment of what was being done correctly. The third fault is that the literature lacks details of fundamental practices of farming: plowing depths, row spacing, seeding density, manuring, etc. These deficiencies were somewhat compensated for by articles in the newspapers devoted to farming.

The literature beginning in the late nineteenth century began treating agriculture by sectors (train, fruit, row crops, dairying, etc.). This is most evident in the government reports which from 1870 to 1915 were more informative than those which preceded or followed. The annual reports of the Department of Agriculture 1901-1915 and their appendices proved to be full of interesting and worthwhile information. The appendices were often annual reports of various sector organizations such as the Fruit Growers' Association, Dairymen's Association, etc. After the federal Research Station was opened in Charlottetown in 1909, it seemed as though the provincial Department of Agriculture relinquished its interest in agricultural research. Still it is not known if the recommendations of these agencies had widespread acceptance in the farming community. There is one notable exception. In the early 1890s, Professor J.W. Robertson of the Dominion Research Station in Ottawa came to the province to encourage farmers to expand the dairy industry. He suggested that there would be multiple benefits to the farmer in that he would be feeding his own stock instead of selling his hay, he would increase the animal wastes which could be returned to the land, and he would have a cash crop of milk. Robertson also promoted the establishment of cheese and butter factories to process this extra milk. It can be determined from census records that Robertson's promotion was successful, for in the next several decades the number of dairy cows, production factories and output increased significantly.

The literature from 1910 on became more numerous and technical, but must be carefully scanned for particulars of farming practices.

All Island newspapers from earliest times devoted space to agricultural news and advice. In the 1820s, for example, J.L. Lewellin, writing under the pseudonym of "Rusticus", began a series of articles on farming in the Prince Edward Island Register which prompted a good exchange of views from others. However, beginning in 1883 and continuing until 1949, the Journal Publishing Company of Summerside published the P.E.I. Agriculturist, a weekly newspaper devoted to serving the agricultural community. Although it was not possible to scan more than a couple of years of its issues, the P.E.I. Agriculturist appears to be the best reference encountered in this survey regarding the particulars of practical farming advice and news. A similar newspaper published weekly during that same period by the Pioneer Publishing Company of Summerside, the Island Farmer, deserves further inspection also, although a cursory scanning gave the impression that its focus was on horse raising and racing. Since the French language newspaper L'Impartial, published in Tignish from 1893-1915, is already indexed under appropriate subject heading (see LeBlanc, Gabrielle), a review of its contents should be worthwhile.

We close this summary with some responses to the questions posed in the working paper of the Sustainable Agriculture Committee, taking them in the order given.

1. *Identification of fields that were mussel-mudded for comparison with fields that were not.*

There were many references to the improvement in yields in the "mudded" fields found in the literature, but never with specific locations.

[>>>top](#)

2. *Information on crop rotations.*

The long rotation of oats, hay and potatoes was deplored throughout the nineteenth century and well into the twentieth. There are many references in the literature to the best rotations, but it would seem that the farmers were unable to break out of the cycle.

3. *Uses of seaweed.*

Lord Selkirk notes in his diary (1803-1804) the use of seaweed amongst his Belfast settlers and indeed there is evidence that it had been commonly used in the Scottish islands before the Scots emigrated. One writer stated "this manure is so generally used and its value so well understood that it requires little remark here." (Peters, 1851.) Peters further recommended the use of "bog mud" and "salt marsh mud," which gives rise to the speculation that it was this publicity that prompted the wider use of mussel mud around mid-century.

4. *Uses of manure and its composting.*

Many observers lamented the manner in which manure was commonly stored, that it was stacked uncovered for long periods and leached by rainfall. Composting of manure with vegetation was frequently recommended but it is not know if this practice was extensively followed.

5. *Crop species and varieties.*

Much information was found in the annual reports of the Government Stock Farm in the later years and in the reports of the Department of Agriculture 1901-1915, where results of tests of varieties and yields were reported. Nothing was found which would suggest that seeds from earlier varieties are still available.

6. *How did mixed grain cultivation get going?*

In the annual report of the Department of Agriculture for 1909 is a discussion of the increasing production of mixed grain crops. Apparently this had been recommended for several years but with limited response, The report stated that such mixtures as oats and

vetches or peas, or of oats and barley gave higher yields than when grown separately. Moreover, they matured in the "free time" between haying and general harvesting.

7. *Tree fruits, varieties and scab control.*

There was a re-awakened interest in horticulture in the late 1890s, possible in response to Robertson's call for diversification, and a good deal of material on horticulture was located, particularly in the seven annual reports of the Fruit Growers' Association which still exist. Varieties tested and found most suited to Island growing conditions are mentioned, as well as every aspect of orchard maintenance, disease and insect control, packing for shipment, marketing, etc. The varieties mentioned in the literature sound unfamiliar and have likely been replaced by modern varieties.

By 1909, however, a note of pessimism was evident in the reports. It seemed that unsuitable varieties had been planted and that orchard maintenance required a great deal of skill and attention which was often lacking. Winter kill was a frequent hazard and marketing and shipping were often difficult.

8. *Weeds.*

Several discussions of weeds and their control were found. The annual report of the Department of Agriculture for 1906 contains an appendix of line drawings and photographs of the most common weeds then in P.E.I., and another article discusses control measures. Legislation was enacted requiring each landowner to be responsible for weed control on his own property.

9. *Reaction to the introduction of chemical fertilizers.*

It might be difficult to determine when chemical fertilizers were first introduced. Probably the first mention noted in this review was a report of the importation of the components for a chemical fertilizer in the late 1800s (see Tulloch Farm). It apparently was a novelty at that time and the newspaper account was favourable, with the farmer using the fertilizer considered progressive. In other instances in a later period, the only concern was for the cost of the chemical fertilizer over that of traditional manures.

10. *How were animals grazed?*

It was apparent from the literature that in the early days of settlement it was common practice to allow the animals to roam at large. This seems to have been corrected in the latter nineteenth century when fencing was the norm. Little mention was otherwise found concerning methods.

11. *What were the diets of animals?*

There seemed to be general agreement that diet needed improvement, but no specifics were seen. The aforementioned newspapers are a likely source of particulars.

12. *How were the illnesses of animals treated, and what were they?*

Remarkably little was found which sheds light on this topic except in the agricultural newspapers and in an unpublished essay on the history of veterinary medicine (see Ings, et al.) Which combined historical research and information from among the Island's practicing veterinarians.

[>>>top](#)

13. *How was knowledge gained?*

Considering the incidence of illiteracy in the countryside of the 1800s, knowledge must surely have been disseminated orally. The earliest agencies actively pursuing the improvement of farming methods were the agricultural societies, and their meetings throughout the Island were devoted to advising the farmer on all aspects of farming. Skill sharing amongst the farmers was promoted and ideas doubtless exchanged at ploughing matches, grain fairs, livestock exhibitions, on market days or at any community gathering.

For the literate the agricultural societies imported agricultural periodicals and books and encouraged their use. Newspapers frequently carried news of developments in the agricultural sector and advice to farmers.

After the demise of the agricultural societies, there was a period of political unrest in the province and no formal agencies existed to give advice or instruction. In the latter part of the nineteenth century there was once again a move to bring agricultural education to the farmer. Organizations representing various agricultural sectors were founded such as the Dairymen's Association, the Fruit Growers' Association, etc., and their mandates included helping the farmer improve his skills. The Farmers' Institutes came into being at about this time with similar objectives. By the early twentieth century agricultural instruction was being offered in the schools and at Prince of Wales College.

14. *Spring snow as poor man's fertilizer.*

One or two references to the effects on the land of prolonged snow cover were found, but nothing that specified late snowfall. (See Lewellin, J.L.)

15. *People sharing work and equipment.*

Neighbours helping neighbours was clearly an essential part of farm life. The many community histories record these activities, or "bees", during harvesting, wood splitting, barn-raising, cloth fulling frolics, etc., which became social gatherings when the work was finished.

There was little information on sharing equipment, although cooperatives were formed by the Acadians of Prince County early in this century to purchase heavy equipment.

17. *Timing of crop planting.*

This is discussed in the normal literature and more often in newspapers during the first half of the 1800s. Some of the newspaper articles were reprinted from American journals and were of questionable value. The first generations of farmers doubtless determined planting times after having experienced Island conditions.

An article was located in the P.E.I. Agriculturalist which discusses planting according to the phase of the moon and the sign of the zodiac. (See Lunar Influence on Vegetation.) It is well known that older generations of farmers took these considerations seriously.

18. *What crops were grown?*

In the early days, the French preferred peas and wheat, the Loyalist wheat, and the Scots, of course, oats. There were many references to these cultural preferences. However, they all quickly came to appreciate the value of the potato which was so well suited to Island growing conditions. The annual reports of the agricultural societies published in the newspapers and their advertisements recorded the early varieties of seeds which were imported. Clark's Three Centuries and the Island contains a wealth of information on crops which were grown.

19. *Supply of seeds.*

These were often brought by the immigrant for his first planting, and subsequently obtained from the agricultural society's depots in various communities. The society preferred the North American varieties as more suited to Island growing conditions. New England was a usual source. Seeds were also imported by early enterprising merchants.

Beginning in the latter half of the nineteenth century there was much discussion in the literature of the extent to which imported seed was contaminated with weed seeds. This led to the encouragement of locally grown seed by the promotion of seed fairs in which prizes were awarded.

20. *Sources of fertilizers.*

There is ample evidence that seaweed was gathered for fertilizer, but the extent to which it was used is not known. Guano was imported in the 1840s by S. Rice of Upton Farm near Charlottetown, but because of the cost it was never considered for general use. Farm animal manures were used when available, but there is no evidence that composting of manure with other vegetation was a common practice, although information on methods appeared frequently in all types of literature. There is no doubt about the extent to which mussel mud was used and appreciated. No information was found on the extent to which green manure crops were grown, but the practice was constantly advocated.

[>>>top](#)

Recommendations

This bibliography provides a checklist of literature considered appropriate and in some degree useful for further evaluation. There are, however, other sources which could profitably be examined if time were available. Mentioned previously are the two newspapers, the P.E.I. Agriculturalist and the Island Farmer, with a combined total of over 100 years of agricultural information, and the French language newspaper L'Impartial, all of which would no doubt yield much useful information.

I would like to thank the staff of the Confederation Centre Public Library and the staff of the Robertson Library, U.P.E.I. for their courtesy and assistance. Also Nicola Cleaveland of the Government Services Library, Mr. Barry Stanfield of the Agriculture Canada Research Library, Ms. Cecile Gallant of the Acadian Museum in Miscouche, and Mr. William Ledwell and Mr. Brian Pollard of the Media Centre in Charlottetown.

I would especially like to thank my husband, Stan, for his invaluable assistance in sharing the task of reading and annotating a very large volume of material.

Elinor Vass

[>>>top](#)

Key to Location Symbols

NSHD	Killam Library, Dalhousie University, Halifax, N.S.
NSTA	Agricultural College Library, Truro, N.S.
PCA	public Archives of prince Edward Island, Charlottetown
PCGS	Government Services Library, Charlottetown
PCIMR	Institute of Man and Resources, Charlottetown
PCL	Confederation Centre Public Library, Charlottetown
PCL(LL)	Legislative Library, Confederation Centre Public Library, Charlottetown
PCLMC	The Media Centre, Charlottetown
PMMA	Le Musée Acadien, Miscouche
PCU	Robertson Library, University of Prince Edward Island, Charlottetown

BIBLIOGRAPHY

Agricultural Historians. History and Development of the Dairy Industry in Prince Edward Island. Charlottetown: The Agricultural Historians, 1978, 104 pp. PCU, PCL

Emphasis on the dairy cow, early cheese and dairying companies, statistics on production, herds, etc. Mentions early breeding associations.

Agricultural Institute of Canada. Prince Edward Island Branch. *Soil Conservation and Related Problems in Prince Edward Island. Charlottetown, 1954, 27 pp. PCGS*

A comprehensive review of soil erosion on P.E.I., with control methods described. Mentions decline in productivity due to decreased fertility. Suggests methods of weed control through cultivation practices.

"Agriculture Industry." *Guardian*, August 24, 1934. PCU, PCL

Highlights of Island agriculture as part of a commemorative issue.

Anderson, Duncan. "Soil Cultivation and Rotation of Crops." *Annual Report of the Department of Agriculture*, 1906, pp. 45-46. PCL(LL)

Anderson, John. "The Dairy Industry." *Past and Present of Prince Edward Island*. Edited by D.A. MacKinnon and A.B. Warburton, Charlottetown: Bowen, 1906, pp. 165-168. PCU, PCL

Describes early development of cheese and butter factories in P.E.I.

Anderson, William. "Reflections on Life on a Farm at St. Peter's at the Turn of the Century." Recorded by Doris Anderson, 1979. Souris, P.E.I.: The Ark Project, 1980, 2 pp. PCU

Archibald, E.S. "Observations on P.E.I. Agriculture." *Annual Report of the Department of Agriculture 1909*, pp. 115-116. PCL(LL)

Overview of the state of Island agriculture, with suggestions for improvement.

Arsenault, Georges. *L'Agriculture Chez les Acadiens de l'Ile-du-Prince-Edouard 1720-1980*. Société St. Thomas d'Aquin, 1981, 69 pp. PCL, PCU

Describes the agricultural methods employed by the Acadians for the earlier days of French settlement, crops, crop rotation, fertilizers, etc. Outlines the activities of the various farm organizations which were developed to help educate and assist the Acadian farmer in later years.

Arsenault, Joseph Edmond. "Acadiens et l'Agriculture dans l'Ile-du-Prince-Edouard." *Culture*, 7 (June, 1946), pp. 220-221. PCU

[>>>top](#)

Notes that most Acadian farms are located in Prince County where the soils are often poorly drained and unproductive. Comments that most farms in 1946 continued to farm as had their ancestors. Mentions the formation of study groups to encourage adoption of newer agricultural methods.

Arsenault, J. Edmond. "Les Acadiens et l'Agriculture dans l'Ile-du-Prince-Edouard." *Compte Rendu. La Convention Nationale Acadienne de l'Ile-du-Prince-Edouard á St. Jacques d'Egmont Baie*. 1951, pp. 64-70. PMMA

Describes the poor soil of most Acadian farms and the resistance of the farmer to newer agricultural concepts. Gives statistics o acreage and crops and speaks of the exodus of the Acadian from the rural to the urban scene.

Atlantic Provinces Agricultural Services Co-ordinating Committee. *Bibliography of Soil Survey and Related Works in Atlantic Canada*. A.P.A.S.C.C., 1985, 35 pp. PCGS, PCL

A comprehensive checklist of recent literature.

Atlantic Soil Fertility Committee. *Atlantic Soils Need Lime*. A.S.F.C., 1977. PCAG

Basic information on lime requirements for pH control.

Bagster, C. Birch. *The Progress and Prospects of Prince Edward Island*. Charlottetown: Queen's Printer, 1861. PCL

Contains notes re soil conditioning and crop rotation for the settler.

Bain, Francis. "Grain Rust." P.E.I. *Agriculturalist*, December 16, 1889, p. 6. PCA

Gives methods for control.

Bain, Francis. "Growing Grain." *Examiner*, March 16, 1885, pp. 1 and 2. PCU, PCL

Discusses what was then considered to be the best methods of soil preparation, including the use of commercial fertilizers, selection and preparation of seed, crop rotation, cultivation, etc.

Battersby, Kenneth A. "Land Use and Economy of Prince Edward Island." A.A. Thesis, Clark University, 1941, 374 pp. PCU

This comprehensive and detailed work aims at relating the character of land use to historical, social and political aspects of life on P.E.I. Contents include:

Distribution and character of land use (tenure, farming methods, crop types and rotations, types of farms and communities). Crops (hay, silage, seed production, fruits and vegetables, farm and community gardens). Livestock and poultry (character and production of horses, cattle, sheep, swine, poultry and eggs, foxes, bee-keeping). Also included are geology, physiography, drainage, climate, soils and their fertility, woodland use, fisheries, urban and recreational land use; and social, historical, political and economic factors. It was stated in the section on soil fertility that, around 1937, P.E.I. used more commercial fertilizer per capita than any other province in Canada; and that in 1940, kelp, mussel mud and fish offal were used as fertilizer mostly among the coastal farms.

Bayfield, Edward. "My Experience with Plums." Appended to the *Annual Report of the Department of Agriculture of Prince Edward Island 1903*, pp. 72-75. PCL (LL)

An address presented at the 7th Annual Meeting of the Fruit Growers' Association. Details his experience of thirty years in orchard planting arrangements, best locations, cultivation, grafting, manuring, fungus control and marketing.

Beck, Boyde. "The Frairest Land" Prince Edward Island in Its Descriptive Literature." *The Island Magazine*, 23 (Spring-Summer, 1988), pp. 19-26. PCU, PCL

Describes the early literature and includes agricultural observations.

Belle, Gail de. *Roadside Erosion and Resource Implications in Prince Edward Island*. Ottawa: Canada Department of Energy, Mines and Resources, 1971, 27 pp. PCU

Excellent report on roadside erosion and its reflection on farmland erosion.

Bourdon, Mary B. *Charlottetown Research Station 1909-1984*. Ottawa: Agriculture Canada, 1984. PCL

A good history of the Station with a concise summary of its operation and studies undertaken.

Bovyer, F.B. "Prospects in Fruit Culture." Appended to the *Annual Report of the Department of Agriculture of Prince Edward Island 1903*, pp. 66-68. PCL(LL)

Contains recommendations for planting, pruning, packing and shipping. Also best varieties for P.E.I.

Boyle, Hester. "Life on the Land; A Story of the Struggles of the Early Farmers on Prince Edward Island." By Hester Boyle et al. Opportunities for Youth Project, 1972. PCU

A summary of the hardships of pioneer life.

Burge, Marie. "Of Size and Sustainability." *New Maritimes*, 6 (November, 1987), p. 3, pp. 6-8.
PCU

A short article supporting recent promotions of sustainable agriculture.

[>>>top](#)

_____. "Self-reliance: A Development Option for Canadian Agriculture." University of Guelph, 1986, 167 pp. PCU

A comprehensive thesis exploring the need for, and the means of achieving, self-reliance in agricultural production and food distribution, all based on sustainable methods of production.

Burke, Alfred E. "Horticulture." *Past and Present of Prince Edward Island*. Edited by D.A. MacKinnon and A.B. Warburton, Charlottetown: Bowen, 1906, pp. 161-164. PCU, PCL

Interesting account of the re-awakened interest in fruit tree planting at the turn of the century. Examples cited of orchards planted ca. 1800 and still bearing. Varieties suitable for P.E.I. growing conditions mentioned.

Cambridge, John. *A Description of Prince Edward Island in the Gulf of St. Lawrence, North America*. London: R. Ashby, 1805, 16 pp. PCU, PCL

A summary of pioneer conditions with a few specifics on agriculture.

Canada, Department of Agriculture. *Fifty Years of Progress on Dominion Experimental Farms, 1886-1936*. Ottawa: King's Printer, 1939, 158 pp. PCAG

Reviews the work in the research stations across Canada, reporting on studies relative to all aspects of agriculture.

Canada, Department of Agriculture. *Making and Feeding Grass Silage in Prince Edward Island*. Ottawa: Canada Department of Agriculture, n.d., 34 pp. PCGS

Discusses factors affecting soil erosion, its effects and control measures.

Canada, Environment Canada. *Land Use in the Atlantic Region: Agriculture*. Ottawa: Environment Canada, 1984, 66 pp. PCGS

Basic land use information.

Canada. Minister of the Interior. *Prince Edward Island: The Garden Province of Canada*. Ottawa, 1906, 12 pp. PCL

Tourist promotion literature primarily, but sections devoted to agriculture. Describes the natural manures found in abundance, crops grown, nature of soil, livestock, etc. Mentions change from exporting raw materials of agriculture to exporting the finished products of agriculture to a much greater degree.

Canada, Parliament, Senate. Standing Committee on Agriculture, Fisheries and Forestry. *Soil at Risk; Canada's Eroding Future; a Report on Soil Conservation*. Ottawa, 1984, 129 pp. PCU

An excellent summary of soil erosion and its control. Includes all aspects of soil management.

Carrington, June. *Gardening with Mulches*. Souris, P.E.I.: The Ark Project, 1981. PCU

Discusses benefits and disadvantages of using mulches, when to apply, etc.

_____. *Horticulture at the Ark*. Souris, P.E.I.: The Ark Project, 1980. PCU

Discusses composting, preparation of demonstration plots, biological control, companion planting, etc.

Cercle des oeufs de Baie-Egmont. "Procès-verbaux et rapports financières, 1917-1935." PMMA

Minutes of meetings of the Egmont Bay Egg Circle. This was a cooperative founded to assist the Acadians of the area to market their eggs.

"Charlottetown Condensed Milk Factory." *Examiner*, January 29, 1903, p. 2. PCU, PCL

Describes the buildings and equipment, capacity, conditions of operation, conditions required of milk suppliers, suggestions to farmers for feeding dairy cows, etc.

Clark, Andrew Hill. *Three Centuries and the Island*. Toronto: University of Toronto Press, 1959, 287 pp. PCU, PCL

This scholarly work surely must be the most accurate and informative description ever written of the Island and its natural resources. Clark objectively combines historical, political and sociological information with that on the natural resource sectors (particularly agriculture). In valuable to other researchers is his extrapolation from census data and crop production statistics to local patterns of agricultural land use and economics. An extremely valuable work.

Clark, J.A. "Apple Growing in Prince Edward Island." *Scientific Agriculture*, 25 (5) (January, 1943), pp. 251-256. PCU

Describes some of the earliest orchards, suitability of Island soils and climate, statistics on fruit production 1880-1930, showing decline in production due to marketing difficulties. Best varieties suggested, advice on planting, pruning and care of orchard.

_____. *Grain Crops in Prince Edward Island*. By J.A. Clark and R.B. MacLaren. Charlottetown: Dominion Research Station, 19 n.d., 4 pp. PCA

[>>>top](#)

Concerns resistance in several varieties of oats and wheat to certain fungus diseases. Probably published early 1940s.

_____. "Hardy Alfalfas in Prince Edward Island." *Agricultural Gazette of Canada*, 5 (1918). Ottawa: Government Printing Bureau, 1918. PCU

Test results of varieties.

_____. "Prince Edward Island Soils and Control Measures for Soil Erosion." *Scientific Agriculture*, 23 (December, 1942), pp. 223-228. PCU

Describes briefly earlier studies, then a project begun at the Charlottetown research station experimenting with various control methods such as crop rotation, contour ploughing, grassed waterways, etc. Recommendations.

_____. "Seed Improvement in Prince Edward Island." *Agricultural Gazette of Canada*, 2 (1915). Ottawa: Government Printing Bureau, 1915. PCU

Varieties and yields demonstrated.

_____. *Seed Oats*. Exhibition Circular No. 47. Ottawa: Department of Agriculture, 1915, 4 pp. PCAG

Reports on studies of best varieties, yields, etc.

_____. *Silage and Silo Construction for the Maritime Provinces*. Ottawa: Canada Department of Agriculture, 1923, 24 pp. PCU

_____. *Varieties of Tree Fruits for Prince Edward Island*. By J.A. Clark and G.C. Warren. Ottawa: Canada Department of Agriculture, 1940, 11 pp. PCAG

Recommendations for varieties best suited for soils and climate of P.E.I.

_____. "Weeds and Their Eradication." Appended to the *Annual Report of the Department of Agriculture for Prince Edward Island, 1906*. PCL(LL)

Recommends crop rotation, cultivation, sowing pure seed, maintaining a clean roadside, and keeping more sheep.

Clark, Jeremiah S. "Farmers' Institutes -- or Schools for the People." *Prince Edward Island Magazine*, 3 (April, 1901), pp. 40-43 and 3 (May, 1901), pp. 86-89. PCU, PCL

Comments on the value of attending such a school.

Clough, Katherine. *An Assessment of the Ark Project*. By K. Clough and June Carrington. Souris, P.E.I.: The Ark Project, 1980, 13 pp. PCU

Discusses soil loss from sloping fields, also natural fertilizers, composting, recycling of wastes from aquaculture experiment of plant cultivation, use of solar heat in greenhouse, etc.

_____. *Biological Control for Disease Control and Increased Vigour of Commercial Crops in the Ark Greenhouse*. 1979. PCIMR

The Colonial Farmer, 2 (19) (April 1, 1843). Halifax, N.S.: The Nova Scotian Office. PCA

This one known extant issue treats many topics of interest to the agricultural community of the day, including elements of the chemistry of barnyard manure as it was understood then, diseases and treatment of horses, etc.

Commercial Tomato Production in Solar-Heated Greenhouse, Using Biological Pest Controls. Souris, P.E.I.: The Ark Project, 1980, 1 pp. PCU

Le Conseil Cooperatif de l'Ile-du-Prince-Edouard. "Procès-verbaux des Assémbles Annuels 1903-1950." PMMA

Minutes of the Annual General Meetings of the Egmont Bay Dairying Association. Includes advice to farmers on pasturing of cattle, improvement of herds, etc. Contains statistics on output of the Abram's Village Cheese Factory, and accounts of the company.

Cotton, W.L. *Chapters in Our Island Story*. Charlottetown: Irwin, 1927, 162 pp. PCL

Contains an excellent summary of crop and stock production over the years.

[>>>top](#)

Crosskill, W.H. *Handbook of Prince Edward Island: The Garden Province of Canada*. Charlottetown: Haszard and Moore, 1906, 124 pp. PCL

Contains some general comments on soils, manures, and agricultural production at the turn of the century.

_____. *Prince Edward Island. Garden Province of Canada*. Charlottetown: Murley and Garnhum, 1899, 9 pp. PCL

Some general descriptions and statistics re agriculture at the turn of the century.

_____. *Prince Edward Island, Garden Province of Canada*. Charlottetown: Murley and Garnhum, 1904, 115 pp. PCL

Similar information to the 1899 edition, but production data much expanded.

Croteau, John T. "The Acadian Grain Banks of Prince Edward Island." *Agricultural History Society*, 29 (July, 1955), pp. 127-130. PCL

A unique aspect of early rural self-help programs on Prince Edward Island.

_____. *Cradled in the Waves*. Toronto: Ryerson Press, 1951, 149 pp. PCL, PCU

This is a well-written account of the rise of the co-operative movement in Prince Edward Island, 1933-1946. It presents first-hand details about the promotion, fieldwork and management of numerous credit unions and marketing co-operatives among the Island's farming and fishing communities. There is no direct information regarding farming practices of the time.

Cullen, Dorothy. "Rural Life in Prince Edward Island in 1864." Canadian Library Association Centennial Series, Occasional Paper No. 50. Ottawa: Canadian Library Association, 1964, 5 pp. PCL

Focus is mainly on the hardships of early pioneer life.

Cullen, Timothy P. "Some Pages from a Diary of T.P. Cullen, 1888-1889," 13 pp. PCU

Daily life of the times chronicled, with farm activities frequently mentioned.

Cumming, M. "Agriculture in the Maritime Provinces." *Canada and Its Provinces*, Volume 14. Edited by Adam Shortt and Arthur G. Doughty. Toronto: Glasgow, Brook and Company, 1914, pp. 635-668. PCU

Includes a brief and generalized account of P.E.I. agriculture. Notes reduced effectiveness of mussel mud after the first application, and injurious effects on some crops when over-used. Notes recent interest in fruit growing.

Cunningham, Ann. *Limestone Study for Prince Edward Island*. The Author, 1969, 25 pp. PCGS

A through discussion of the nature of lime, its mode of action, types available, where available, costs, etc.

Cusack, Leonard John. "The Prince Edward Island People and the Great Depression, 1930-1935." Fredericton, University of New Brunswick, 1972, 188 pp. PCL, PCU

Contains information on the state of agriculture in P.E.I. during the depression.

Dean, H.H. "Co-operation, Consolidation, Education. Three Important Factors in Modern Dairying." Appended to the *Annual Report of the Department of Agriculture for Prince Edward Island, 1903*, pp. 38-40. PCL(LL)

Speech to the dairymen of P.E.I. on the benefits of marketing milk products through larger units, namely cheese factories, and the need for improving the quality of the dairy herd, etc.

Devereux, Joseph. "Looking Backward," 136 pp. PCU

The author's life story, containing details of farming and farm life in the first two decades of this century of P.E.I.

_____. "No Spur to Inflation, a Nostalgic Look at Island Agriculture." *Atlantic Advocate*, 68 (May, 1978), pp. 58-59. PCU

Interesting nostalgia re potato picking and planting on Prince Edward Island, ca. 1900.

Dewar, J. Lincoln. "Sixty Years of an Island Industry." *Atlantic Advocate*, 49 (July, 1959), pp. 91-95. PCU, PCL

[>>>top](#)

The highlights in the development of the Island's dairy industry.

Dewar, Lloyd George. *A History of My Family and the Family Farm at New Perth, Prince Edward Island, and a Short History of New Perth*. Summerside: Williams and Crue, 1975, 160 pp. PCU, PCL

Mostly genealogical and historical information, but some early farming practices described, including the use of mussel mud.

Dixon, Margaret. *Going Home: An Autobiography*. The Author, 1979, 181 pp. PCU, PCL

A sensitive, detailed account of rural life in Hampton, P.E.I., containing many references to agriculture.

Dominion Experimental Station, Charlottetown, Prince Edward Island. *Progress Report 1937-1947*. Ottawa: King's Printer, 1949, 68 pp. PCL

Details the results of the studies undertaken in the period, including those on fertilizers, diseases of potatoes, crop rotation, soils, soil erosion, drainage, etc.

Doyle, Pat. "Agricultural Intensity and Nonpoint Source Pollution on Prince Edward Island." Toronto: York University, 1980. PCU

This thesis discusses the adverse effects of agricultural wastes on stream and estuarine water quality. Presents alternatives in an ecological approach to solving the problem.

Dyck, D. "Farmers' Views on Rural Life in Prince Edward Island." *Economic Annalist*, 31 (December, 1961), pp. 134-140 and 32 (February, 1962), pp. 7-15. PCU

A good inventory of the views of 288 P.E.I. farm families re the pros and cons of farm life.

_____. "Land Use and Farm Income in Prince Edward Island." *Economic Annalist*, 31 (October, 1961), pp. 101-111. PCU

An analysis of changes in cropping patterns among 288 P.E.I. farmers, and of reasons given for the changes.

Dyck, Diedrich. *A Socio-economic Study of Rural Areas of Prince Edward Island, 1959*. Charlottetown: Prince Edward Island Department of Agriculture, 1961, 107 pp. PCL

An analysis of the changing pattern of farming in P.E.I., 1940-1960. Shows changes in cropping patterns, farm size and farm land use in general. Gives farmers' reasons for these changes. Relates changes to social and economic influences felt by farm families.

Erskine, David S. *The Plants of Prince Edward Island*. Ottawa: Canada Department of Agriculture, 1960, 270 pp. PCU, PCL

The definitive work on P.E.I. flora.

Ferguson, Donald. *Agricultural Education*. Charlottetown: J.W. Mitchell Printer, 1884. Microfiche. Ottawa: Canadian Institute for Historical Microreproductions, 1980. PCU

Lecture delivered in Charlottetown in January 1884, outlining the need for agricultural education at all ages and at all levels of society.

Foley, Cynthia. "Soil and Water Conservation Program. Report No. 2, May, 1975-December, 1976," 3 pp. PCAG

Reports on the results of a study of soil erosion giving recommendations for control.

Fondation d'Etudes du Canada. Ministère de l'Education du Nouveau-Brunswick. *Vie de Nos Ancêtres en Acadie: L'Agriculture*. PCU

Early Acadian agricultural methods, tools and equipment of the Acadian farm. Well illustrated.

Freetown Historical Society. *Freetown Past and Present*. Summerside: Williams and Crue, 1985, 464 pp. PCU, PCL

Chapter IV contains information on early farming methods, crops, livestock, etc.

"Fruit Growing on the Island." *Examiner*, February 17, 1903. PCU, PCL

Describes an exhibition of fruit, varieties, etc.

Gallant, Cécile. *Le Mouvement Coopératif chez les Acadiens de la Région Evangéline*, 1862-1982. Le Conseil Coopératif de l'Ile-du-Prince-Edouard, 1982, 282 pp. PCU, PCL

Details the history and progress of the grain banks, the cheese factories, livestock producers, shipping clubs, seed buying clubs, agricultural machinery clubs, egg and poultry associations, all operated in the cooperative spirit to assist the Acadian farmer.

"The Garden of the Gulf: Picturesque Prince Edward Island's Prosperity." *Canadian Trade Review*, November 1900, 56 pp. PCL

Some discussion of the soil, livestock, crops, fruits, vegetables, etc.

[>>>top](#)

Gardiner, George W. "Manuscript History of Prince Edward Island," 26 pp. PCL

Contains early agricultural statistics on exports, early livestock importations, varieties of agricultural products at exhibitions, etc.

Gesner, Abraham. "Report of the Geological Survey of Prince Edward Island." Appendix D. *Journal of the House of Assembly of Prince Edward Island*, 1847, 20 pp. PCL

The first survey of the Island's surficial geology. Contains references to kitchen middens, small deposits of minerals, etc. Also a good assessment of Island soils.

Gilhooly, P. "Farm Management Study of Prince Edward Island Potato Farms." By P. Gilhooly and A. Gosselin. *Economic Annalist*, 17 (2) (May, 1947), pp. 38-40. PCU

Sampling 180 potato farms on P.E.I., an analysis was made of farm practices. Finding indicated practices largely standardized as the crop rotation, sprays and fertilizers used, potato varieties grown, etc. Study included financial report and evaluation of efficiency.

Gilkeson, Linda A. *Commercial Tomato Production in Solar Greenhouses*. Souris, P.E.I: The Ark Project, 1980, 7 pp. PCIMR

_____. *Crop Production and Biological Management of the Solar Greenhouse at the P.E.I. Ark*. Souris, P.E.I.: The Ark Project, 1980. PCU

_____. *Preparation and Management of Greenhouse Soils*. By Linda A. Gilkeson and Katherine Clough. Souris, P.E.I.: The Ark Project, 1980, 1 p. PCIMR

"Growing Grain." P.E.I. Agriculturalist, March 26, 1885, p. 2. PCA

A good article on growing grain in P.E.I.

Hall, Elizabeth. Compost: A Guide to Making and Using Compost. Souris, P.E.I.: The Ark Project, n.d., 14 pp. PCU

Discusses methods and material with a table of nutrients. Well illustrated.

Harvey, D.C. The French Regime in Prince Edward Island. New Haven, Conn.: Yale University Press, 1926, 265 pp. PCU, PCL

Harvey quotes the opinions of several early French visitors re the state of the eighteenth century Acadian farms. They were all impressed with the heavy crop yields.

Harza of Canada Ltd. "Soil Conservation Program for the Atlantic Provinces: A Report Prepared for the Department of Forestry and Rural Development." Moncton, 1968. PCGS

Discusses problems in the study area, predictions and recommendations for conservation.

Haszard, H. Prince Edward Island: A British Colony. London: Wyatt, 1862, 31 pp. PCL

Some very general agricultural information.

Hewitt, C. Gordon. "Address on Injurious Insects." Appended to the Annual Report of the Department of Agriculture 1905. Pp. 104-112. PCL(LL)

Discussion of the more troublesome insects and of their control. Includes manual removal, painting and spraying. Recommendations for kinds of sprays and schedules.

Higgins, John K. Farm Drainage in the Atlantic Provinces. Atlantic Agricultural Engineering Committee, 19 n.d., 15 pp. PCGS

Requirements of various soils, types of drainage systems, special problems and construction of systems.

_____. Farm Ponds. Atlantic Agricultural Engineering Committee, 1977, 19 pp. PCU

_____. Land Clearing for Agricultural Production. Atlantic Agricultural Engineering Committee, 1977, 12 pp. PCAG

Hill, S.S. A Short Account of Prince Edward island. London: Madden Co., 1839, 90 pp. PCL

Contains a general description of agriculture in the early 1800's.

[>>>top](#)

Himelman, Don. Farmstead Windbreaks. By Don Himelman and J.P. Arsenault. Prince Edward Island Department of Agriculture and Forestry, 1982. PCU

A good summary. Gives ideal locations, designs, species composition and effects of windbreaks in protecting crops and reducing soil erosion.

Hopper, W.C. "Agriculture in Eastern Canada." *Busy East of Canada*, 13 (May, 1923), pp. 19-23, 32. PCU

This summary includes Ontario and Quebec as well as the Maritime provinces. Describes first agricultural undertakings in each province. Mentions agricultural societies, then the establishment of the Experimental Farm system.

Howatt, Betty Kind. "Farming Today: Use/Misuse of the Soil." *P.E.I. Envirooneer*, 6 (Summer, 1978), p. 12. PCU

Very brief article which discussed the transition on the farms from horse power to mechanization and long rotation f row crops, and the soil fertility loss which resulted.

_____. "Farming -- a Life Style." *Heritage Foundation Newsletter*, 4 (February, 1974), p. 5. PCU

Ings, Jane. "The History of Veterinary Medicine on Prince Edward Island." By Jane Ings, Blaine MacKinnon and Wendy Rowell. Charlottetown, 1983, 50 pp. PCU

Covers the topic thoroughly.

L'Institut des Fermiers de Saint-Chrysostome. "Procès-verbauz. Décembre 1938-Janvier 1940 et 1952-1955." PMMA

Minutes of the meetings of the Saint Chrysostome Farmers' Institute.

L'Institut des Fermiers Union. "Procèè-verbaux. 1912-1925." PMMA

Minutes of the Farmers' Institute of Egmont Bay, called the Union Farmers' Institute, comprised of members from Lot 14, 15 and part of Lot 16. Lectures given at the meetings to encourage farmsers to improve their stock, have farms drained, etc.

L'Institut des Fermiers Union. "Proces-verbaux. 1925-1950." PMMA

Minutes of the Farmers' Institute of Egmont Bay. Lecturers at these meetings encouraged the farmers to form co-operatives for buying grain, livestock, farm machinery, selling eggs, wool, etc.

The Island Farmer. Published from July to November, 1878 by Schurman Bros., Summerside. Published from January 1889 to December 1947 in Summerside by the Pioneer Publishing Company. PCA

This Island newspaper published local and international news, household hints, home remedies, recipes, etc. Its main interest and focus was on the raising and racing of horses. However, it did print many articles of interest to the farmer on all aspects of agriculture, including home veterinary remedies.

"Island Farming a Century Ago Holds Comparison with the Present Day." Journal Pioneer, Centennial Edition, June 29, 1973, Section B14. PCU

A quite general review of past conditions.

Jenkins, J.T. "Letter." P.E.I. Agriculturalist, December 27, 1883, p. 3. PCA

Mentions the need for agricultural information relevant to Island farm conditions. Encourages farmers to produce livestock. Information re manure.

Johnstone, John. "The Need for Grafting and My Experience Therein." Appended to the Annual Report of the Department of Agriculture, 1904. PCL(LL)

Johnstone, Walter. Travels in Prince Edward Island, Gulf of St. Lawrence, North America in the Years 1820-1821... Also, Nine Letters Descriptive of the Agricultural State of That Island. Edinburgh: James Robertson; London: Baldwin, Cradock and Joy, 1824, 172 pp. PCU, PCL

In the Nine Letters, Johnstone describes early pioneer agriculture in some detail. The whole work vividly describes early pioneer life.

Kemp, Ernest. The Oyster Fisheries of Canada. Ottawa: Government Printing Bureau, 1899, 101 pp. PCL

Kemp draws attention on pages 91-92 to the damage done to the oyster beds by the mussel mud digging.

Klinck, L.S. "The Improvement of Farm Crops by Seed Selection." Appended to the Annual Report of the Department of Agriculture, 1907, pp. 82-88. PCL(LL)

Persuading the farmer to make the extra effort in selecting the best seeds. Figures presented showing increased yield per acre.

Lattimer, J.E. Report of Economic Survey of Prince Edward Island, with Particular Emphasis on Agricultural Needs. Prince Edward Island Department of Reconstruction, 1944, 56 pp. PCL

Detailed account of Island life and conditions. Information on field crops and horticulture. Advice to potential British immigrants, re tools and seeds to bring to P.E.I.

[>>>top](#)

LeBlanc, Gabrielle, Compiler. Inventaire de L'Impartial. Journal publié Tignish, Ile-du-Prince-Edouard de 1893 à 1915. La Societe Saint-Thomas d'Aquin, 1980, 110 pp. PCL

This French language newspaper published in Tignish between 1893 and 1915 has been indexed by Gabrielle LeBlanc and Diane Lecouffe. It includes articles under the subjects of agriculture, dairying, horticulture, farmers clubs and societies, etc.

Lewellin, J.L. "Emigration. Prince Edward Island." In Journeys to the Island of St. John or Prince Edward Island, 1775-1832. Edited by D.C. Harvey. Toronto: Macmillan, 1955, pp. 175-213. PCL

Contains description of the primitive condition of agriculture on the Island ca 1830. Describes the length of the growing season, condition of the soil, crops which grow well, etc. It is more a treatise on how things could be improved. On page 189, Lewellin states that "...although the Winter is long, it much assists the farmer, fertilizing the earth; probably equal to half a dressing of manure."

Lothead, Wm. "Directions for Treatment of Insect Pests and Plant Diseases." Thirteenth Annual Report of the Fruit Growers' Association of Prince Edward Island, 1908. Charlottetown: Murley and Garnhum, 1908. PCL(LL)

Manual and chemical control. Formulae, quantities, schedules, etc.

_____. "The Weeds of Prince Edward Island." Appended to the Annual Report of the Department of Agriculture, 1906. PCL(LL)

Methods of control of the more common "noxious weeds," usually by alternating crop rotations and using varieties of cultivating practices -- harrowing, deep plowing, etc.

"Lunar Influence on Vegetation." P.E.I. Agriculturalist, December 27, 1883, p. 3. PCA

A detailed schedule of planting various crops in accordance with the phase of the moon and the signs of the zodiac.

MacDonald, A.F. Selected Annotated Bibliography of Recent Research on Rural Life on Prince Edward Island. By A.F. MacDonald and H.J. O'Connell. Charlottetown: Department of Sociology and Anthropology, U.P.E.I., 1972, 70 pp. PCL, PCU

Contains recent (1965-1972) socio-economic surveys of P.E.I. natural resource sectors, including agriculture, with the purpose of obtaining long-range planning information.

MacDonald, Fred J. "The Manurial Value of Marine Algae." P.E.I. Agriculturalist, March 31, 1880, p. 1. PCA

Includes chemical analyses of various marine plants used as fertilizer in Eastern Canada. Evaluation of best varieties, recommendations for drying, etc.

MacDonald, Hubert T. *The Lords of the Isles and Their Descendants*. Winnipeg, Manitoba: Canadian Pub., 1944, 220 pp. PCL

Chapter 12 is an interesting and detailed account of pioneer life with the Scots settlers on P.E.I. Cropping, farm equipment, implements described.

MacDonald, R.C. *Sketches of Highlanders*. St. John: Henry Chubb, 1843, 70 pp. PCU

Mentions progress made by the Scots settlers in agriculture to that date.

MacDougall, J.I. *The Soils of Prince Edward Island. Preliminary Report of the Soil Survey of Prince Edward Island*. By J.I. MacDougall, C. Veer and F. Wilson. Ottawa: Canada Department of Agriculture, 1981, 139 pp. PCAG, PCL

This is the definitive work on the nature of Island soils and their suitability for agricultural crop production. It replaces an earlier and similar survey by Whiteside, improving upon the latter by being based on a greater density of soil sampling and by having several new series defined. The maps that will accompany the final report are now (1988) being compiled.

McGregor, John. *British America*. In two volumes. London: Blackwood, 1833, Volume I, pp. 485-559. PCL

Volume I contains a section on Prince Edward Island, and gives a brief description of soils, agricultural production, planting, manuring, etc.

McGuigan, Hugh. "Growing up on St. Peter's Road, Lot 22, P.E.I." The author, 1971, 139 pp. PCU

The author's remembrances of growing up as a member of a disadvantaged farm family in pre-World War I P.E.I. Describes the hardships of working without mechanization, etc.

[>>>top](#)

McIssac, Leo P. *Our Island Farm Scene; Now and Back Awhile*. The author, 1988, 247 pp. PCL

A comprehensive review of the background and activities of many farm organizations and the important people involved in the agricultural industry on Prince Edward Island. Emphasis on the twentieth century.

MacKay, Kenneth Tod. *Exploration of Self-sufficiency at the P.E.I. Ark. Souris, P.E.I.*: Institute of Man and Resources, 1978. PCIMR

MacKinnon, Wayne E. Agriculture: A Portfolio of Information Related to the Agricultural Heritage of Prince Edward Island. Charlottetown: P.E.I. Heritage Foundation, 1974. PCL

The assembled portfolio contains reproductions of photographs and newspaper items depicting aspects of nineteenth century agriculture in P.E.I.

Macleod, D.J. Studies in Potato Diseases. Ottawa: Canada Department of Agriculture, 1931, 25 pp. PCU

A detailed description of powdery and common scab diseases of potatoes.

McNeill, A. "Report of Orchard Meetings Held During the Summer of 1907." Appended to the Annual Report of the Department of Agriculture, 1907, pp. 48-57. PCL(LL)

Review of visits made to many orchards on P.E.I. Suggestions for improvement in variety selection, care of orchards, overcoming marketing problems by co-operative buying and selling, etc.

Macoun, W.T. "Guides t Successful Fruit Culture." Appended to the Annual Report of the Department of Agriculture, 1904, p. 23. PCL(LL)

_____. "Notes on Plum Culture." Appended to the Annual Report of the Department of Agriculture, 1902, pp. 76-77. PCL(LL)

_____. The Potato in Canada: Its Cultivation and Varieties. Ottawa: Canada Department of Agriculture, 1918, 16 pp. PCU

Describes crop rotation and fertilization for maximum yields, preparation of the land, selection of best seed potatoes, spraying for insects and diseases, etc.

_____. " The Site and Protection of the Orchard on Prince Edward Island." Appended to the Annual Report of the Department of Agriculture, 1902, pp. 81-85. PCL(LL)

Discussion of soils, site location for protection, windbreaks, best planting arrangements, etc.

MacQuarrie, Ian G. Soil Erosion on Prince Edward Island: A Report to Executive Council. Charlottetown: Environmental Associates, 1979, 38 pp. PCGS

A concise and authoritative work on soil erosion, with recommendations for policy and practice regarding its control.

MacQueen, Malcolm A. Skye Pioneers and the Island. Winnipeg: Stovel Co., 1929, 162 pp. PCU, PCL

Some brief references to early agricultural methods, from clearing the land to harvesting the first crop. Crude implements described.

McRobie, George. *An Island Future: Towards Sustainability and Self-reliance*. Charlottetown: Institute of Island Studies, U.P.E.I., 1988, 9 pp. PCU

A concise statement on the subject and directed to P.E.I. circumstances.

Mahoney, Susan. "Kickin the Chemical Habit." *Atlantic Insight*, 5 (10) (October, 1983), p. 8. PCL

Practical demonstration of soil management by a Montague farmer.

Mitchell, J.W. "Drainage Instruction and Demonstration. Maritime Provinces." *Agricultural Gazette of Canada*, V, 1918. Ottawa: Government Printing Bureau, 1918. PCU

Moase, Norman H. "Agriculture in the Maritime Provinces." *Dalhousie Review*, 39 (Winter, 1960), pp. 471-484. PCU

A substantial review and analysis of the social, political and economic changes involving Maritime (and P.E.I.) Agriculture. Mid to late 1800s (briefly) and to mid 1900s.

Monro, Alexander. *New Brunswick with a Brief Outline of Nova Scotia and Prince Edward Island*. Halifax, R. Nugent, 1855, 384 pp. PCL

Treats agriculture generally and notes improvements to that date in cropping and cultivation practices.

[>>>top](#)

Mooney, Pat. "Sustainable Agriculture." In *Land Festival and Popular Hearings, Proceedings*. Sponsored by Cooper Institute. South Rustico, P.E.I., August 6-8, 1987, pp. 113-118. PCU

Contains relevant material on the subject.

Morrison, J. Clinton. *Along the North Shore*. The author, 1983, 639 pp. PCU, PCL

Description of early land clearing, storage of root crops and general conditions of early settlement.

Munro, D.C. "Yield Potential of a 'Run Down' Potato Soil." *Extension Information for Potato Growers in P.E.I.*, 1973. Charlottetown: P.E.I. Department of Agriculture and Forestry, 1973, 41 pp. PCAG

Murchison, I.M. "The First Island Peaches." Appended to the *Annual Report of the Department of Agriculture of Prince Edward Island*, 1902, pp. 71-72. PCL(LL)

Report of his experiments in growing peaches in the Bonshaw district of P.E.I. Experience over a four year period; he reported losses from frost, but remained optimistic. Managed to harvest one peck.

Nash, F.J. "Prince Edward Island's progress." Canadian Magazine, 23 (6) (October, 1904), 3 pp. PCU

A brief summary of progress in agriculture, mentions varieties of apples being grown, and beginning use of new fertilizers.

National Film Board. Farmers Helping Farmers. VHS and 16mm film, 27 ½ minutes. Brian Pollard, Director, 1987. PCLMC

Documentary account of exchange between farmers of Prince Edward Island and Kenya. Twenty Island farm families fund approximately 200 appropriate technology food-growing projects in Kenya. Film shows how ordinary people can become effectively and directly involved in international development, and what a small amount of cash can accomplish. Also shows the farm of King Howatt in Tryon, where much of the operation is based on appropriate technology.

_____. Prince Edward Island. VHS, 10 minutes. Margaret Perry, Director, 1947. PCLMC

This video concentrates mainly on the basic Island industries of fishing and farming, although a larger segment is devoted to agriculture. Shots and narration of all aspects of a mixed farming operation of the period. Shows teams of horses drawing an assortment of machinery, etc.

_____. Vignettes. Mussel Mud. 16mm film, 2 minutes, 28 seconds. Aileen Brophy, Director, 1985. PCLMC

A very short film, mainly animations of teams of horses and wagons coming to a mussel much "frolic." There are some brief film clips of an actual mussel mud digger in operation, owned by a Murnaghan family of Bethel. Brief but informative.

"Necessity For an Agricultural Education." Prince Edward Island Magazine, 6 (May, 1904), pp. 180-181. PCU, PCL

Nicholson, Ronnie. "Land-Use and Landscape History in Prince Edward Island." 1969, 71 pp. PCU

A good university term paper, treats soil erosion, crop rotations, etc.

Nowland, J.L. The Agricultural Productivity of the Soils of the Atlantic Provinces. Ottawa: Canada Department of Agriculture, 1975, 19 pp. PCU

Describes soil capability and limitations for agriculture, based on Canada Land Inventory data.

"One Hundred Years of Agriculture, 1867-1967." Guardian, August 30, 1967. PCU

Many illustrations, photographs of early farm implements and machinery, bug-pickers, fodder choppers, tread-mills, etc.

Parent, R.C. "Agriculture in the Maritime Provinces: Its Present and Future Possibilities." Atlantic Advocate, XLVII (June, 1957), pp. 31-36. PCL

A very good summary of deficiencies in Maritime agriculture with special emphasis on farmers' indifferent soil management.

_____. "The Effect of Limestone Applications on Soil Composition, Potato-scab Development and Yields of Potatoes, Barley and Corn." By R.C. Parent, R.F. Bishop and H.J. Atkinson. Canadian Journal of Agricultural Science, 34 (1954) pp. 573-581. PCAG

Report of a field experiment begun in 1931 at the Charlottetown Experimental Station. Plot had not been limed in many years. Tables presented showing rate of limestone application and production of scab, etc.

Parks, Douglas Lyal. Successful Crop Production in Eastern Canada. Toronto: McClelland and Stewart, 1955, 314 pp. PCU

Emphasizes sound soil management and production of forage plants, hay and silage, grains and potatoes, weed control, etc., to counteract the depletion of soils, dwindling yields and depressed incomes.

Paton, Valerie. "The History of Veterinary Medicine in Prince Edward Island." Charlottetown, University of Prince Edward Island, 1981, 21 pp. PCL

Good thesis presenting a wealth of historical information.

Peters, James Horsfield. Hints to the Farmers of Prince Edward Island. Charlottetown: J.J. Pippy, 1851, 76 pp. PCL

Contains much interesting material on manures, soil care, crop rotation and animal husbandry. Indicates that the lack of attention to these matters was widespread in P.E.I.

Philpotts, L.E. Aerial Photo Interpretation of Land Use Change in Fourteen Lots in Prince Edward Island, 1936 to 1958. Ottawa: Canada Department of Agriculture, 1964, 56 pp. PCU

[>>>top](#)

An earlier data base of changing land use in P.E.I., developed through air photo interpretation.

"Potato Bug Makes Its Appearance on P.E.I." Patriot, August 8, 1882, p. 2. PCU

Found at the farm of John Binns, New Glasgow.

"Prince Edward Island." A Hundred Years in the Dairy Industry, by Veronica McCormich. Dairy Farmers of Canada, 1968. Pp. 119-121; 125-126. PCU

Brief history of the Island's dairy industry, establishment of cheese factories, milk production statistics, etc.

Prince Edward Island Advisory Reconstruction Committee. Interim Report. Charlottetown, July 1945. PCU

Pages 108-179 deal with agriculture and how the industry might be conserved and expanded to provide employment for returning servicemen. Discusses reduced soil fertility and soil erosion and recommends remedies. Suggests the provision of local cold storage and grain storage facilities.

P.E.I. Agriculturalist. May 31, 1883-January 29, 1949. Summerside: Journal Publishing Company. PCA

Published for over 60 years, this Island newspaper included local, national and international news, advice to homemakers, home health care remedies, etc., but its main thrust was in its advice to farmers on all aspects of the agricultural industry, including veterinary remedies. While much of the information published was obtained from outside the province, there were frequent articles and letters of advice from Islanders involved in the industry.

Prince Edward Island. Commissioner of the Government Stock Farm. "Report of the Commissioners of the Government Stock Farm." 1867-1901. Appended to the Journal of the House of Assembly of Prince Edward Island 1867-1901. (Not a continuous run, as the Reports were frequently "ordered not printed".) PCL(LL)

This agency followed the agricultural societies in representing the agricultural interests of the province. When the Department of Agriculture was established in 1901, it took over the operation of the Stock Farm, and a Commissioner of Agriculture headed the Department until 1924, when the position was replaced by a Minister of Agriculture.

Since the emphasis at the Stock Farm was on developing superior breeding stock to help the farmer improve his stock, the annual reports were frequently little more than an inventory of stock and buildings. A 1866-67 report noted that a "mud-digger" had been purchased and that "mudding" the land continued. By 1871 there were increased yields

on the mudded land. There followed a brief period of experimentation in cereals, vegetables and root crops, including sugar beets.

Prince Edward Island Conference on Ecological Agriculture. Proceedings. Edited by Martha Musgrove Pratt. Charlottetown: Man and Resources Institute, 1978, 196 pp. PCU

Twelve articles on applied ecological agriculture; cropping, forestry, soil management, erosion control, biological control of pests, composting, etc.

Prince Edward Island. Department of Agriculture. Annual Report of the Department of Agriculture, vol. I, 1901. Charlottetown: John Coombs, King's Printer, 1902. 1901 + PCA, PCL(LL)

For the first decade or so, these reports and their appendices provided a wealth of information on every aspect of agriculture. The Department undertook considerable experimentation on cereal, forage and root, crops, vegetables, fruit, bee-keeping, animal husbandry, dairying, fertilizers and manures, crop rotation, etc. It encouraged the formation of study groups such as the Farmers' Institutes, and it encouraged adult education and agricultural education in the schools. It gave short courses on identification and eradication of harmful insects and weeds. It promoted the formation of co-operative marketing agencies, seed fairs and competitions, exhibitions, etc.

After 1911, when the Dominion Experimental Farm was established in Charlottetown, agricultural experimentation by the Department received much less attention, although it was not entirely abandoned.

Between 1915 and 1917, land drainage demonstrations were conducted after a drainage digging machine was purchased. In 1920, a limestone pulverizer was purchased to take advantage of a limestone reef in Miminigash. There was a fear that the mussel mud banks were becoming depleted and other sources of limestone should be developed. A 1930 study concluded that stable manure was a better fertilizer than chemical fertilizers.

It was recorded that on October 25, 1922, the first shipment of seed potatoes was sent from Prince Edward Island.

From 1925, the Annual Reports recorded the activities of the Department, gave statistics, and carried the reports of the various organizations affiliated with the Department, but there were virtually no studies carried out or reported on.

[>>>top](#)

Prince Edward Island. Department of Agriculture. The Official Report of the Annual Meeting of the Fruit Growers' Association of Prince Edward Island. Volumes 1-13, 1898-1908. PCL(LL)

Volumes 1-6 were published separately, before the formation of the Department of Agriculture was established. There are no known extant copies. However, volumes 7-12,

included with the Annual Reports of the Department of Agriculture, are very informative. Well-qualified people spoke at the annual meeting on a variety of topics and these lectures were incorporated in the annual reports. Report number 13 for 1908 was located as a separate publication in the Legislative Library.

Prince Edward Island. Department of Agriculture. The Weeds of the Province of Prince Edward Island. Charlottetown: Murley and Garnhum, 1906. Illustrated. Appended to the Annual Report of the Department of Agriculture for the Province of Prince Edward Island, 1906. PCL(LL)

Photographs and illustrations of the more common weeds.

Prince Edward Island. Department of Agriculture and Forestry. And So Goes the Soil: A Case for Better Management on Prince Edward Island. Charlottetown: P.E.I. Department of Agriculture and Forestry, 1979, 16 pp. PCU

A brief but excellent summary with photographs of soil erosion. Suggested remedies.

_____. Soil and Crops Division. Current and Proposed Programs in Soil Conservation. Charlottetown: P.E.I. Department of Agriculture and Forestry, 1973. PCGS

_____. "Family Farm Program, 1971-1972." Paper presented at Conference of Canadian Ministers of Agriculture, 1977, 6 pp. PCU

A "Small Is Beautiful" promotion of the family farm, citing failures in Canadian government policies as some reasons for its decline.

_____. The Future of the Small Family Farm in Canada. Charlottetown: P.E.I. Department of Agriculture and Forestry, 1977. PCU

Mostly statistics of farm sizes, production and incomes.

_____. Organic Matter and PH Levels in P.E.I. Soil Samples, 1972-1977. Soil and Feed Test Laboratory, Technical Services Branch, P.E.I. Department of Agriculture and Forestry, 1977, 13 pp. PCGS

Summarized in histograms: applies to five major crop soils.

Prince Edward Island Federation of Agriculture. "Brief to the Prince Edward Island Legislature, March 11, 1948," 10 pp. PCA

Primary concern outlined in the brief is the deterioration of soil quality through the use of commercial fertilizers. Suggestions as to how the government might encourage increased and improved livestock production in mixed farming operations, "land cropped without livestock is not a farm, it's a mine." Requests assistance in soil conservation, drainage, marketing, rural electrification, etc.

Prince Edward Island Illustrated. Charlottetown: The Examiner, 1897, 56 pp. PCL

Contains a section on agriculture, in general terms.

Prince Edward Island. Information Regarding Its Climate, Soil, Resources, etc. Published by the Authority of the Provincial Government. Charlottetown: The Herald Office, 1883, 34 pp. PCL

A general description of P.E.I. and its resources. Contains interesting descriptions and opinions re soil quality, and fertilizing with natural manure, mussel mud and with chemical fertilizers.

Prince Edward Island. Information Regarding Its Climate, Soil, Resources, etc. Ottawa: MacLean, Rogers and Company, 1888, 16 pp. PCL

Describes the soil, abundance of natural fertilizers, mussel mud, peat and marsh mud, seaweed, fish offal, limestone.

Prince Edward Island Royal Commission on Land Ownership and Land Use. Interim Report. The Commission, 1973. PCL

Basic information for planning and development of the Island's natural resources.

Raad, Awni. Highlights of Present and Future Government Policy in Soil and Water Conservation. Charlottetown: P.E.I. Department of Agriculture and Forestry, 1973, 47 pp. PCU

A collection of brief reports by provincial staff re projects planned or desired for P.E.I.

Rawson, Mary. "Minimum Maintenance.

A Report for the Royal Commission on Land Ownership and Land Use, Prince Edward Island. Charlottetown: Canada Department of Regional Economic Expansion, 1973. PCU

A good review of land management in P.E.I. based on the concept of minimum land maintenance for those lands that lay idle, and owned by resident or non-resident.

Raymond, C.W. "Land Abandonment in Prince Edward Island" by C.W. Raymond and J.A. Rayburn. Geographical Bulletin, 19 (1963), pp. 78-86. PCU

A good inventory.

_____. Land Utilization in Prince Edward Island. Ottawa: Department of Mines and Technical Surveys, 1963, pp. 34-36. PCU

Presents a wealth of detail for interpreting the land use in P.E.I. Agricultural use and production are emphasized.

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Rayner, John W. "Agriculture." In *Preserving the Past: A History of Cascumpec-Fortune Cove, 1779-1979*. Compiled by J. Arthur Hudson and S. Jean Meggison, 1979, 412 pp. PCL, PCU

A very good synopsis of agricultural history in P.E.I.

Readey, J.C. "Agriculture." In *Past and Present of Prince Edward Island*. Edited by D.A. MacKinnon and A.B. Warburton. Charlottetown: Bowen and Co., 1906, pp. 153-161. PCL

Highlights of the agricultural history of the province, including the formation of agricultural societies etc.

_____. "Our Farming System." *Annual Report of the Department of Agriculture 1906*, pp. 58-63. PCL(LL)

A denunciation of the system of cropping in the province which had depleted the soil. Some basic time and labour management suggestions, as well as suggestions of crop rotation and fertilization to improve soil quality.

Reek, W.R. "Agriculture in Prince Edward Island." *Agricultural Gazette of Canada*, III (1915). Ottawa: Government Printing Bureau. PCU

General outline of topography, soils, crops, and fertilizers used, including mussel mud.

_____. "Farm Drainage. Prince Edward Island." *Agricultural Gazette of Canada*, III (1915). Ottawa: Government Printing Bureau. PCU

Describes the manufacture of drainage tiles on the Island, and a drainage demonstration.

_____. "Rural Life Conference. Prince Edward Island." *Agricultural Gazette of Canada*, II (1915). Ottawa: Government Printing Bureau. PCU

_____. "Short Courses. Prince Edward Island." *Agricultural Gazette of Canada*, II (1915). Ottawa: Government Printing Bureau. PCU

Review of courses given in the province in 1915.

Reid, E.P. *Atlantic Provinces Agriculture*. By E.P. Reid and J.M. Fitzpatrick. Ottawa: Canada Department of Agriculture, 1957. PCAG

Production analysis.

Reid, S.E. "Address Before the Farmers' Institute of Charlottetown." *Annual Report of the Department of Agriculture, 1906*, pp. 23-38. PCL(LL)

An overview of the state of agriculture with advice on how agricultural production could be increased by better soil management, crop rotation, fertilizing, and selection of improved seed and livestock, etc.

Reid, W.J. "The Sheep Industry. Prince Edward Island." Agricultural Gazette of Canada, I (1914). Ottawa: Government Printing Bureau. PCU

Discusses the causes for the decline of the industry in P.E.I.

Rennin, William. "Address Before the Farmers' Institute of Charlottetown." Annual Report of the Department of Agriculture, 1906, pp. 56-57. PCL(LL)

Advice on the selection of good seed, proper cultivation of the soil, and on fertilizers.

Report to Accompany the Blue Book of Prince Edward Island. Compiled by Lieutenant-Governor Robinson. Charlottetown: Bremner Bros., n.d. (Ca. 1870), 56 pp. PCL

Statistics on acreage, farm stock and implements.

Robertson, J.W. "An Address Before the 7th Annual Meeting of the Fruit Growers' Association of P.E.I." By Professor J.W. Robertson, Commissioner of Agriculture, Ottawa. Appended to the Annual Report of the Department of Agriculture, 1902, pp. 77-81. PCL(LL)

An appeal to the farmer to take good care of his soil, and how, so that his orchard will be more productive. Also tips on packing fruit for shipment.

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Rogers, David Whitfield. Grassland, Pasture, Silage and Hay: A Major Resource of Prince Edward Island. Charlottetown: P.E.I. Department of Agriculture, 1963. PCU

Statistics on livestock, acreage, etc. Discusses treatment of pasture land. Results of pasture improvement using various combinations of fertilizers and manure alone. Study suggests province could support an increase of 150 per cent in livestock production.

Ross, H.R. "Cultivation of the Soil." Appended to the Annual Report of the Department of Agriculture, 1902, pp. 40-41. PCL(LL)

Describes preparation of land to be seeded, rotation of crops and the value of immediate application of fresh manure, etc.

Ross, Theodore. "Agriculture in Prince Edward Island: The Emerald Isle of the New World." Busy East of Canada, 4 (October, 1913), pp. 24-25. PCU

Report of the field crops which do well, yields for 1912, efforts to improve livestock, etc.

_____. "Agriculture in Prince Edward Island." Agricultural Gazette of Canada, I (1914).
Ottawa: Government Printing Bureau. PCU

Briefly traces a century of various organizations and agencies devoted to agricultural interests, from the early agricultural societies through to the establishment of the Experimental Station in Charlottetown.

_____. "Co-operation. Prince Edward Island." Agricultural Gazette of Canada, I (1914).
Ottawa: Government Printing Bureau. PCU

Discusses the development of co-operative dairy factories and creameries, and the co-operative marketing of eggs.

_____. "Demonstration Orchard Work." By Theodore Ross and L. Tennant. Agricultural Gazette of Canada, II (1915). Ottawa: Government Printing Bureau. PCU

Demonstrations in pruning, grafting, spraying, etc.

_____. "Farmers' Clubs. Prince Edward Island." Agricultural Gazette of Canada, II (1915).
Ottawa: Government Printing Bureau. PCU

These clubs received government grants to carry out their work of instruction and education, etc.

_____. "Good Seed Movement in Prince Edward Island." Agricultural Gazette of Canada, I (1914). Ottawa: Government Printing Bureau. PCU

Discusses competitions and prizes awarded as an incentive to the production of improved seed on the island.

_____. "Improvement of Creamery Butter. Prince Edward Island." Agricultural Gazette of Canada, II (1915). Ottawa: Government Printing Bureau. PCU

Discusses improvements achieved through instruction offered creamery workers in short courses.

_____. "A new Year in Agricultural Instruction." Agricultural Gazette of Canada, II (1915).
Ottawa: Government Printing Bureau. PCU

Outlines the organized instruction in the province from 1886 on, which continued with grants from the Federal Department of Agriculture.

_____. "Potato Growing. Prince Edward Island." Agricultural Gazette of Canada, II (1915).
Ottawa: Government Printing Bureau. PCU

Describes the use of chemical fertilizers added to the natural fertilizers of barnyard manure, seaweed and "swamp muck". Chemical composition of fertilizer given.

_____. "Production of Vegetable Seeds. Prince Edward Island." Agricultural Gazette of Canada, III (1916). Ottawa: Government Printing Bureau. PCU

_____. "Seed Fairs." Agricultural Gazette of Canada, III (1916). Ottawa: Government Printing Bureau. PCU

Prizes awarded for the best quality seed, as an incentive to production of good seed on the Island.

_____. "Short Courses. Prince Edward Island." Agricultural Gazette of Canada, II (1915). Ottawa: Government Printing Bureau. PCU

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Describes various courses of instruction given in the provinces in 1914.

_____. "Some Injurious Insects." Annual Report of the Department of Agriculture, 1907, pp. 60-66. PCL(LL)

Life histories with methods of control, some manual, some sprays recommended.

Royal Agricultural Society. "Minutes of the Royal Agricultural Society of Prince Edward Island, 1849-1863." Manuscript. PCL

The minutes deal with election of officers, finances, importation of seeds and livestock, arrangements for exhibitions, plowing matches, grain shows, etc.

Ryle, Gerry. Greater Self-Sufficiency in Maritime Agriculture: The Need, Directions and Prospects. Charlottetown: Institute of Man and Resources, 1978. PCIMR

Seeding and Planting Techniques for Use in Greenhouses. Souris, P.E.I.: The Ark Project, 1980, 1 p. PCU

Selkirk, Thomas Douglas, 5th Earl. The Collected Writings of Lord Selkirk, 1799-1809. Volume I. Edited by J.M. Bumsted. Winnipeg: Manitoba Record Society, 1984, 359 pp. PCL

Describes method of clearing land, planting crops. Gives production figures per acre, etc.

_____. Lord Selkirk's Diary, 1803-1804. Toronto: Champlain Society, 1958, 372 pp. PCL, PCU

Describes settlers' preference for marsh hay, gives harvesting dates, notes that seaweed is "esteemed as a manure." Gives estimated yields per acre, rotation of planting in newly-cleared land, crops grown, etc.

Shaw, Walter Russell. "Prince Edward Island – The Story of Its Agriculture." Canadian Geographical Journal, May 1956. PCL

Gives an historic overview, then details conditions of the time, types of soil and its degradation by generations of farmers, importations of grains and fertilizers, statistics on production, etc.

"Short Courses on Fruit Packing." Agricultural Gazette of Canada, II (1915). Ottawa: Government Printing Bureau. PCU

Shutt, Frank T. The Soils of Prince Edward Island; Their Nature and Composition with Suggestions as to Fertilizer Treatment. Ottawa: Canada Department of Agriculture, 1928, 20 pp. PCU

Gives results of soil nutrient analyses on randomly sampled farmlands (50) and recommends nutrient treatment. Some relationships between present conditions with past applications of mussel mud is shown.

Smitheram, Verner. The Garden Transformed: Prince Edward Island, 1945-1980. Edited by V. Smitheram, D. Milne and S. Dasgupta. Charlottetown: Ragweed Press, 1982, 271 pp. PCL, PCU

Contains two relevant chapters – changing land use patterns and agriculture in transition. Both identify social and economic factors that work against the development of sustainable agriculture.

Starr, R.W. "Comparison of Different Variety of Apples." Appended to the Annual Report of the Department of Agriculture, 1902, pp. 56-59. PCL(LL)

Evaluates many varieties of fruit and their suitability and adaptability for P.E.I.

Steward, D.J. "Cherry Growing in Prince Edward Island." Appended to the Annual Report of the Department of Agriculture, 1902, pp. 68-70. PCL(LL)

Recommendations for varieties and results of his own experiences in Kings County.

Stewart, John. An Account of Prince Edward Island in the Gulf of St. Lawrence, North America. London: W. Winchester and Son, 1806, 304 pp. PCL, PCU

Contains an excellent account of pioneer farming in P.E.I.

Stewart, John A. 'What the Farmers Are Doing in Eastern Canada.' In "The Use of Conservation of Canada's Farm Lands." Agricultural Institute Review, 9 (2) (March-April, 1954), pp. 25-28. PCU

Discusses briefly and in general terms soil conservation problems and measures undertaken to correct the problems.

Stewart, Norbert. Agricultural Wastes – Their Value and How to Manage Them. P.E.I. Department of Agriculture and Forestry, 1974, 1 p. PCU

Explains nutrient value of animal manures and rates of production.

_____. Erosion Study Project. P.E.I. Department of Agriculture and Forestry, 1972, 16 pp. PCGS

Outline of proposed project. Indicates past work and current thinking.

_____. The Fertilizer Value and Storage of Animal Manures. P.E.I. Department of Agriculture and Forestry, 1974. PCU

Explains nutrient value of animal manures.

_____. "Soil Conservation." Abegweit Review, 3 (2) (1982), pp. 17-20. PCU

A brief but pointed description of soil lost through erosion on test plots at Kinkora, P.E.I.

_____. "Soil Erosion by Water." P.E.I. Envirooneer, 2 (Summer, 1974), pp. 14-15. PCU

Figures indicating soil loss in tons per acre, also loss of fertilizers. Suggestions for prevention.

[>>>top](#)

_____. "Soil Erosion Studies – Freetown Soil Erosion Plots." In Current and Proposed Programs in Soil Conservation. Compiled by the Soil and Crops Division. P.E.I. Department of Agriculture and Forestry, 1973. PCGS

_____. "Soil Erosion Studies in Prince Edward Island." By Norbert Stewart and D. Himelman. Paper presented at the Soil Erosion Workshop, Nova Scotia Agricultural College, Truro, N.S., 1979, 6 pp. PCGS

Report on the results of a study on a selected site near Freetown, P.E.I. Describes measured soil loss on selected plots under varying conditions, with recommendations for control.

Taylor, J.W. An Inquiry into the Nature and Value of the Various Shell Muds Used in Prince Edward Island as Manures. Charlottetown: P.R. Bowers, 1872, 33 pp. PCL

Detailed description of shell mud chemistry as it was known in 1872. No mention of cropping results after "mudding."

Thos. Hall & Co. Descriptive Catalogue, 1893. PCL

Facsimile catalogue, with illustrations and descriptions of machinery manufactured by the company.

Trueman, Howard Thompson. Early Agriculture in the Atlantic Provinces. Moncton: Times Printing Co., 1907, 131 pp. NSHD

Discussion of the loss of fertility in the mid-nineteenth century on P.E.I. and the application of seaweed and mussel mud to redress the situation. Tells of Professor J.W. Robertson's visit to the Island in the 1890s and of his promotion of the expansion of the dairy industry as a means of increasing farm income and of increasing the output of manures, etc. Theory had been put forth that mussel mud could only be profitably applied every 15 years. Robertson disagreed.

"Tulloch Farm." Examiner, January 17, 1889. PCL, PCU

Description of the Ferguson farm in Lot 34, bordering on the Hillsborough River. Good accounts of use of "artificial" manures. Describes importation of component chemicals and mixing them for various crops, with results.

United Nations. Food and Agriculture Organization. Soil Erosion by Water" Some Measures for Its Control on Cultivated Land. U.N. Food and Agriculture Organization, 1965, 284 pp. PCGS

Describes the nature and control of soil erosion caused by agricultural use.

"Variety of Crops Grown in the Maritime Provinces." Busy East of Canada, 7 (February, 1917). PCU

Mentions oats as Island's largest crop, potatoes second. Largest hay producer for its size in North America.

Vass, Elinor. "The Agricultural Societies of Prince Edward Island." The Island Magazine, 7 (Fall-Winter, 1979), pp. 31-37. PCU, PCL

Describes the work undertaken by these societies to assist the Island farm in practical terms, such as the importation of seeds, tools, livestock, etc. Mentions also the educational efforts put forth to encourage the farmers to improve their skills and farming methods.

Veer, C. The Organic Soils of Prince Edward Island: Preliminary Report. Ottawa: Agriculture Canada, 1978, 28 pp. PCAG

Authoritative description of organic soils and their derivation and potential use.

Veinot, Richard. "Lime Usage and Requirements in the Maritimes Under Current Fertility and Management Practices." In Atlantic Plant Food Education Meeting. Summary of Presentations. Memramcook, N.B., March 4-5, 1974, 6 pp. PCU

This report treats current problems in crop production as they relate to plant nutrient requirements and recommends corrective measures.

_____. Liming and Profit. P.E.I. Department of Agriculture and Forestry, 1974, 1 p. PCU

Graphs showing increased yields and profits obtained by applications of lime.

_____. "Soil Management and Crop Rotations." In Proceedings of Quality Potato Processing Seminar. Compiled by Don Madame. Charlottetown: P.E.I. Department of Agriculture, 1980. PCU

Wade, Nicholas. "New Alchemy Institute: Search for an Alternative Agriculture." Science, CLXXXVII (February, 1975), pp. 727-729. PCU

[>>>top](#)

Promotion of an ecological approach to agriculture.

Weale, David. "The Mud Diggers." The Island Magazine, 5 (Fall-Winter 1978), pp. 22-30. PCL, PCU

A good account of the process of obtaining shell mud through the ice.

_____. Prince Edward Island – Its People and Its Land. Charlottetown, 1980, 32 pp. PCU

A rationale for new policy and programming regarding P.E.I. agriculture. Arguments given are similar to those given in support of sustainable or self-reliant agriculture.

_____. "The Shell-Mud Diggers of Prince Edward Island." In Canadian Papers in Rural History. Volume 2. By Donald H. Akenson. Gananoque, Ont.: Langdale Press, 1980, pp. 41-57. PCU

An excellent account of mud-digging with footnotes of sources consulted.

Western Agricultural Convention. "Second Quarterly Meeting." P.E.I. Agriculturalist, February 21, 1884, p. 2. PCA

Contains, among other topics, accounts of farmers; experiences with manure and mussel mud.

White, Ronald P. "Cropping Problems and Programs on Wet Soils." In A Symposium: Soil Physical Problems and Crop Production in Eastern Canada. Proceedings. Compiled by the Agricultural Institute of Canada Conference, 1976. PCAG

Thorough discussion of imperfectly drained soils and the cultivation methods and cropping selections preferred, and to be avoided.

White, W.C. "My Experience with Variety." Appended to the Annual Report of the Department of Agriculture, 1903, pp. 20-23. PCL(LL)

Report on a small experimental orchard in Brighton, P.E.I.; varieties preferred, care of orchard etc.

Whiteside, G.B. Soil Survey of Prince Edward Island. 2nd Edition. Ottawa: Canada Department of Agriculture, 1965, 70 pp. PCU, PCL

The first definitive survey and classification of P.E.I. soil types. Includes maps, with one depicting soils capability for agricultural production.

Wightman, F.A. "The Shell Mines of Prince Edward Island." The Canadian Magazine, 40 (4) (February, 1913), pp. 329-334. PCU, PCA

States that from earliest times, it was recognized that the soils of P.E.I. Required lime. Supplies obtained by burning shells in lime kilns, or by importing limestone from Cape Breton. Found it easier to apply the shell mud directly on the land. Author states that the discovery of the benefits of shell mud marked an epoch in the Island's agricultural history, "since it doubled the yield, and a good dressing will last for twenty years." Goes on to describe the mud digging machines, and the negative effects of applying too much like or mussel mud.

Willis, Nancy. Report on the Comparative Study of Regimes for Soil Restoration and Fertility Maintenance. Souris, P.E.I.: Institute of Man and Resources, 1978. PCIMR

Winson, Anthony. "The Roots of Agrarian Decline: Farming in the Maritimes, 1850-1930." Halifax, St. Mary's University, 1985. PCU

The thesis developed reasons that the farmer was generally unable to increase his acreage, to expand his operation, to make mechanization feasible, and thus cut production cost.

Wood, Kay. "Organic Farming." Journal Pioneer, April 13, 1981. PCU

Rather generalized. Mentions gathering seaweed for fertilizer.

Wright, L.E. "Soil Fertility Studies: Manure and Fertilizers for Potatoes at Charlottetown, P.E.I." *Scientific Agriculture*, XXX (November, 1950), pp. 447-455. PCU

Report of a 22-year observation of 24 plots growing potatoes with conventional fertilizers, manures and combinations thereof, and with zero through various crop rotations. One of the four main conclusions was that manure is extremely beneficial to the soil of P.E.I.

Young, John. *The Letters of Agricola on the Principles of Vegetation and Tillage*. Written for Nova Scotia and Published first in the *Acadian Recorder*. Halifax: Holland & Co., 1822, 456 pp. PCL, NSTA

a collection of essays on agricultural technology and chemistry as it was understood in 1822. Deals with many topics, such as soil preparation, manures, etc. It is included, as his letters were frequently reprinted in the Island newspapers of the day, and he was considered to be an authority on the subject of agriculture.

Zavitz, C.A. "Clover Culture." Appended to the Annual Report of the Department of Agriculture, 1902, pp. 44-47. PCL(LL)

Reports on the value to the soil of clover culture. Gives summary of experimentation. Suggestions for best varieties, soil preparation, etc.

[>>>top](#)

ENDNOTES

1. Bruce MacLaren, 10 September, 1988.
2. Don Stewart, 19 September, 1988.
3. Bruce MacLaren.
4. Leo MacIsaac, 31 October, 1988.
5. Ernest MacPhee, 8 November, 1988.
6. Ernest MacPhee.
7. According to Lyall Boswall, 12 September, 1988, 6-row barley produced better yields.
8. Norman Black, 17 October, 1988.
9. Norman MacDonald, 13 September, 1988.
10. Preston Wood, 12 October, 1988.

11. David Ling, 17 January, 1989.
12. Bruce MacLaren.
13. Alton Raynor, 13 October, 1988.
14. Eric Robinson, 22 September, 1988.
15. William MacDonald, 5 November, 1988.
16. Ralph Gay, 18 October, 1988.
17. Wilfred Shaw, 25 October, 1988.
18. Bruce MacLaren.
19. Betty Howatt, 24 November, 1988.
20. Austin Bowman, 3 October, 1988.
21. Bruce MacLaren.
22. Eric Robinson.
23. David Ling.
24. Norman Black.
25. Charles Jones, 28 September, 1988.
26. Everett Howatt.
27. Leo MacIsaac.
28. David Ling.
29. Norman MacDonald.
30. Lyall Boswall.
31. Raynall MacNeill, 20 September, 1988.
32. Douglas MacFarlane, 29 September, 1988.
33. David Ling.

34. Claude Barrett, 29 October, 1988.
35. Ernest MacPhee.
36. Percy MacPherson, 19 October, 1988.
37. Charlie MacNevin, 18 November, 1988.
38. Arthur Hughes, 19 November, 1988.
39. Arthur Hughes.
40. Arthur Hughes.
41. David Ling.
42. Norman MacDonald.
43. Charles Jones.
44. Betty Howatt.
45. Norman Black.
46. William Johnston, 15 September, 1988.
47. Lyall Boswall.
48. Augustine Arsenault, 1 December, 1988.
49. Ernest MacPhee.
50. Wilfred Shaw.
51. John A. Cheverie.
52. Arthur Hughes, Percy MacPherson, et.al.
53. Ernest MacPhee.
54. Gerald Handrahan, 10 December, 1988.
55. Augustine Arsenault.
56. Brent Currie, 17 November, 1988.

57. Brent Currie.
58. Bob MacRae, 24 September, 1988.
59. Arthur Hughes.
60. Lyall Boswall.
61. Neil Garrett, 9 October, 1988.

[>>>top](#)

62. Ernest MacPhee.
63. Claude Barrett.
64. Norman Black.
65. Leo MacIsaac.
66. Emmert Hughes, 7 October, 1988.
67. Johnny Wilson, 15 October, 1988.
68. Don Stewart.
69. Charlie MacNevin.
70. Percy MacPherson, Betty Howatt, Arthur Hughes.
71. Don Stewart.
72. Norman Black.
73. David Ling.
74. Bruce MacLaren.
75. Leo MacIsaac.
76. Raynall MacNeill.
77. Charlie MacNevin.
78. Doug MacFarlane.

79. Bob MacRae.
80. Arthur Hughes.
81. Bruce MacLaren.
82. Eric Robinson.
83. Alton Raynor.
84. Don Stewart.
85. Don Stewart.
86. Betty Howatt.
87. Bob MacRae.
88. Ralph Gay, 18 October, 1988.
89. Charles Jones.
90. Claude Barrett.
91. Brent Currie.
92. Betty Howatt.
93. Raymond Acorn, 9 October 1988.
94. Leo MacIsaac.
95. Arthur Hughes.
96. Raymond Acorn.
97. Johnny Wilson.
98. Austin Bowman.
99. Everett Howatt.
100. William MacDonald.
101. Nancy MacFarlane (Doug MacFarlane).

102. Douglas MacFarlane.

103. Ralph Gay.

104. Claude Barrett.

105. Brent Currie.

106. Arthur Hughes.

107. Bruce MacLaren

108. Betty Howatt.

109. Norman Black

110. Charles Jones.

111. Frances Jones.

112. Leo MacIsaac.

[>>>top](#)

113. Don Stewart.

114. Zeno Gallant, 6 October, 1988.

115. Raymond Acorn.

116. Tom Murphy, 7 November, 1988.

117. William MacDonald.

118. Betty Howatt.

119. Raymond Acorn.

120. Betty Howatt.

121. Don Stewart.

122. Betty Howatt.

123. Frances Jones.

124. Douglas MacFarlane.
125. William MacDonald.
126. Frances Jones.
127. Leo MacIsaac.
128. Brent Currie.
129. Emmert Hughes.
130. Wilfred Shaw.
131. Ernest MacPhee.
132. William MacDonald.
133. Ruby Jay, 11 September, 1988.
134. Ruby Jay.
135. Emmert Hughes.
136. Ruby Jay.
137. Gordon Carver.
138. Emmert Hughes.
139. Ruby Jay.
140. Betty Howatt.
141. Brent Currie.
142. Ernest MacPhee.
143. Don Stewart.
144. Frances Jones.
145. Austin Bowman.
146. Ruby Jay.

147. Charlie MacNevin.
148. Ruby Jay.
149. Douglas MacFarlane.
150. Charles Jones.
151. Betty Howatt.
152. Lyall Boswall.
153. Don Stewart.
154. Leo MacIsaac.
155. Raynall MacNeill.
156. Charles Jones.
157. Brent Currie.
158. Augustine Arsenault.
159. William MacDonald.
160. Claude Barrett.
161. Arthur Hughes.
162. Betty and Everett Howatt.
163. Raynall MacNeill.
164. Eric Robinson.
165. David Ling.
166. Raynall MacNeill.
167. Charlie MacNevin.
168. David Ling

[>>>top](#)

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