Considerations for Seed Security and Biodiversity Conservation in Newfoundland

A Scan of Current Seed Security Work, Partnership Opportunities, and Seed Issues in Newfoundland

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October 2016















EXECUTIVE SUMMARY

This research explores and assesses various perspectives on seed security issues in Newfoundland and is meant to inform the creation of an action plan for seed security work in Newfoundland in coming years. Drawing on ten interviews with individuals actively involved with seed saving and conservation, the report describes recent seed security efforts on the island and the current needs and assets.

The unique conditions on the island include short growing seasons to harsh climatic conditions in the winter months, making the availability of locally adapted seed crucially important. Public interest in seed security is on the rise but local resources and funding to support seed activities is limited. The demand for locally sourced seed is significant but there are still few seed-savers. There is good seed access on the island and seeds are generally available at the quality and quantity farmers want and need, however, many seed varieties are considered to be very expensive. There is significant concern for endangered local varieties and erosion of genetic diversity, in particular with respect to Newfoundland heritage potato seed. The study could not conclusively determine the feasibility of developing a seed bank in Newfoundland.

Social Sciences and Humanities Research Council of Canada | Conseil de recherches en sciences humaines du Canada | Canada

This research was made possible by the Social Sciences and Humanities Research Council through the *Food: Locally Embedded, Globally Engaged* partnership and the support from the **Atlantic Canadian Organic Regional Network, The Bauta Family Initiative on Canadian Seed Security and Echo Foundation**. The findings presented here do not necessarily reflect those of the Atlantic Canadian Organic Regional Network, The Bauta Family Initiative on Canadian Seed Security, or Echo Foundation.

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Introduction

The purpose of this document is to explore and assess various perspectives on seed security issues in Newfoundland, with a view to supporting a vibrant seed saving and farming community on the island. Consulting with participants in the seed sector is key to informing appropriate projects and programs to be undertaken there. This report will form the basis for ongoing consultations, and the eventual creation of an action plan for seed security work, led by the Atlantic Canadian Organic Regional Network (ACORN), in Newfoundland over the next two years.

This report was produced for the Atlantic Canada Research Node of the *Food: Locally Embedded, Globally Engaged* (FLEdGE) project, in partnership with ACORN, with funding from the Social Sciences and Humanities Research Council, The Bauta Family Initiative on Canadian Seed Security, and Echo Foundation.

What Is Seed Security & Why Does It Matter?

Seed security can be defined as having access to adequate quantities of good quality seed and planting materials of preferred crop varieties at all times following good and bad cropping seasons (UNFAO, 2015).

Seed security matters because it is inherently linked to food security. Seed is the first link in the food chain and the foundation of the world's agriculture. Nine of out of every ten bites of food begin with seed (Agriculture and Agri-Food Canada, 2016).

Globally, we have lost 75% of agricultural biodiversity in the last one hundred years (UNFAO, 1999), which has significant consequences for farmers and eaters alike. Farmers have long understood that seed diversity means food security. By planting a wide variety of seeds in their fields, farmers offset risk, betting that at least some will produce food, regardless of what environmental and production challenges will come. If those varieties are regionally adapted, their chances are even better. In this way, access to diverse regional seed can "make or break" farmers' ability to avoid or recover from a bad season, especially in an era of climate change. Ensuring access to the right seed ensures that farmers can produce food and plan to produce food for seasons to come (USC Canada [2], 2014).

Agriculture and Seed Saving in Newfoundland: Challenges & Opportunities

As with most global challenges, loss of seed security finds local expression in a number of ways. Newfoundland's economy, geographic isolation, short growing season, cool climate and sometimes-extreme weather conditions pose special challenges to achieving seed security. The ecological farming sector in Newfoundland is comprised of small-scale farms producing a diverse range of crops including vegetables, fruit and berries, greenhouse production, in addition to several livestock operations. Most farmers work full-time off-farm jobs in addition to their agricultural work, and the perceived high costs of

transitioning to organic production is a deterrent for many. Agriculture is limited to areas such as south of St. John's, around Deer Lake and in the Codroy Valley. The loss of arable land impacts the availability of suitable farmland for vegetables and fruit production, which is another major challenge facing agricultural producers. This poses significant implications for food security and seed security for the entire province of Newfoundland and Labrador (Crocker, 2013).

Ecological seed production requires more time and attention than raising food crops. In a setting where agriculture is challenging, seed production is especially difficult. In addition to cold weather, short growing seasons, and isolation, threat factors for seed security include varietal suitability, high seed prices and shipping costs, and a lower volume of organic agricultural production in general as compared to other Canadian regions. These factors discourage the raising of seed crops in Newfoundland.

Despite these challenges, there are several opportunities to promote seed security in the area. There are training and education opportunities to empower farmers and gardeners to become better seed savers. For example, the Food Security Network of Newfoundland and Labrador hosted a workshop on Seed Saving as part of a series of workshops on eight different food skills. The workshops intended to foster "knowledge, capacity, and engagement with healthy, traditional food skills in their communities" (Food Security Network, 2015). Other organizational support for organic agriculture and seed production in the form of training and educational opportunities include organizations like ACORN. ACORN's participation in seed-related activities include facilitating peer support and information exchange about seeds, as well as hosting seed saving workshops across Atlantic Canada.

Saving seed has many benefits extending from cost savings, to building local and resilient seed systems, to saving traditional seed varieties from extinction. Saving seed not only produces good seed, but also an abundance of seed. The sharing culture around seed saving also encourages more growers to save, share and replant seed. (USC Canada [1], 2016).

There is also a growing demand for local seed varieties in Newfoundland. Newfoundland's strong food culture presents a culinary opportunity that requires the best hearty local ingredients and cold-climate vegetables. Generally, people want to grow what they like to eat, therefore the demand for traditional seed varieties is increasing. Newfoundland cuisine includes a well-developed taste for certain crop varieties of cabbage, potato, squash and turnip, among others. These crop varieties are often used in local, traditional dishes, such as the commonly prepared Newfoundland "Jiggs Dinner", which typically consists of salt beef, potatoes, carrot, cabbage, and turnip.

There is potential to meet this demand because of a long-standing tradition of seed saving in the province. In Newfoundland, it was commonplace to grow and save heirloom and

other traditional seed varieties prior to 1940s. The majority of agricultural biodiversity loss has occurred since that time (*The Independent*, 2013). Often, the reduced use of traditional varieties is correlated to times when commercial hybrid varieties are introduced into seed markets and traditional farming systems (FAO, 2012). This is likley the case in Newfoundland as well.

There is still a small number of suppliers in Newfoundland who supply some heirloom strains of plants for purchase, such as The Seed Company by E.W. Gaze (formerly known as Gaze Seeds). Historically, The Seed Company has always imported and repackaged seeds for sale as there was little seed saving happening locally. They have recently, however, begun selling seeds in partnership with a local seed saver, Dan Rubin. This shift signals increasing interest in specializing in flowers and vegetables particularly well suited to Newfoundland's conditions, which is a significant and unique market opportunity for island seed savers.

It is within this unique context that this exploration of seed security issues in Newfoundland begins.

Approach/Methodology

Semi-structured interviews with seed producers, farmers, researchers, government, non-profit organizations and community groups were carried out to assess the current seed work being done in the province as well as explore the potential of local partnerships to deepen and expand that work.

A province-wide callout for those who are active in seed saving and conservation work in Newfoundland was distributed to recruit participants. The responses from interested individuals resulted in ten interviews with a total of nine participants. They represented the Newfoundland agricultural sector either as farmers (four participants), or civil society organization (CSO) employees and/or volunteers (six participants). One interviewee represented both groups and completed two interviews as a result.

The nine interviewees who agreed to participate were then interviewed by phone. Prior to each phone interview, individual participants read and signed a consent form[1]. All interviews took place during the summer of 2016. All participants agreed to be identified in the report.

Each interview was approximately 30-45 minutes in length and addressed the opportunities and challenges for agriculture and seed saving in the province. Interview questions were tailored to each specific group. Questions for CSOs related to the participants' understanding of seed security, what seed conservation work is currently being done, and their willingness to participate in future seed projects in the area.

[1] The project was cleared by Carleton University Research Ethics Board.

Some example questions include:

> *What kind of work do you do and/or projects do you run that have to do with seed and seed security?*
> *From your experience, how would you rate and/or describe seed security in Newfoundland?*
> *Are you interested in expanding into doing (more) seed work?*

Farmers were asked some similar questions, however the majority of their questions related to seed and seed varieties. General questions related to seed saving were also asked, such as "do you save seed?", "where do you source your seeds?", and questions about seed availability and quality were discussed to help paint a picture of the current seed market in Newfoundland. To determine which varieties should be the focus of future seed conservation work, direct questions about seed varieties were asked, including:

> *What varieties of vegetables or grains are important to you?*
> *What works really well on your farm and/or in your climate?*
> *What varieties would you like conservation efforts to focus on?*

In closing for each interview, both groups were asked about their understanding of seed banks and seed libraries. Additionally, they were asked to share their thoughts and opinions on the value of having a seed bank in the province. Please see Appendices A and B for the complete set of interview guides and questions.

Section 1: Civil Society Organizations, Businesses & Academia

This section provides a scan of current seed work in Newfoundland. Information was gathered via interviews with representatives of CSOs and academic institutions. Part A provides an overview of the interview participants. Part B describes the interview findings, and expands upon any trends or divergences within the data set.

A - Overview

Table 1. List of Participating Civil Society Organizations, Businesses & Academia

Name & Location	Participant Description
Grenfell Campus at Memorial University Corner Brook, NL	Memorial University's Grenfell Campus offers a comprehensive Fine Arts program, in addition to some specialized environmental research programs. Associate Professor, Dr. Catherine Keske's research focuses on food security, food sovereignty, and agricultural production. Current projects pertain to the boreal ecosystem and sustainable economic development. https://www.grenfell.mun.ca
Western Environment Center (WEC) Corner Brook, NL	The WEC is a non-profit organization serving Western Newfoundland. WEC strives to engage communities in environmental issues through community events and projects related to environmental action and sustainability. These activities may include long-term projects (community gardens), public events (environment week), working committees, and addressing inquiries regarding local and regional issues of environmental concern. Katie Temple is the Executive-Director of WEC. https://wecnl.wordpress.com
St. John's Seed Library St. John's, NL	The St. John's Seed Library is a local resource for seed savers. There are currently 81 members– mostly backyard gardeners. Founder, Sarah Crocker has over 10 years' experience in the Newfoundland food sector. In that time, she has completed a strategic plan for the organic sector in Newfoundland titled "Newfoundland and Labrador Organic and Ecological Sector: Profile and Strategic Plan". Sarah also farms at Seed to Spoon Farm. Her insights are included in both Part 1 and Part 2.

Name & Location	Participant Description
The Seed Company by E. W. Gaze St. John's, NL	The Seed Company is located in St. John's, Newfoundland, and specializes in selling high-quality vegetable and fruit seeds to farmers around the province and surrounding Bay in smaller, rural communities, such as Goulds and Torbay. The store also carries several types of soils, fertilizers, and garden supplies. Jackson McLean is the Store Manager. https://www.theseedcompany.ca
The Greenhouse Little Rapids, NL	The Greenhouse is a garden center and landscaping company in western Newfoundland. The Greenhouse offers a variety of products and services, including high quality plants raised in a chemical-free environment. Kim Thistle is the Owner-Operator (with Sean Dolter). https://www.thegreenhouse.ca
Memorial University of Newfoundland Community Garden St. John's, NL	The Memorial University of Newfoundland (MUN) Community Garden at Memorial's St. John's campus is "a place for the Memorial community to grow food, work together and enjoy the outdoors." The garden offers gardening plots, workshops and other resources. Trevor VandenBoer is a volunteer on the board responsible for managing seed saving activities. http://www.mun.ca/communitygarden/

Additional stakeholders and consultants in the area include:

1. Agriculture and Agri-Food Canada Regional Office
2. Provincial (NL) Department of Natural Resources - Agrifoods Branch
3. NL Federation of Agriculture
4. NL Horticulture Producers Council
5. Food Security Network NL (FSN)

B – Interview Findings: Insights and Trends

The majority of respondents have a good understanding of seed security. Of six respondents, only one participant stated that they were not familiar with the term nor did they know what it meant. When asked what the term means to them, respondents emphasized having an adequate seed supply for the future. Their responses included macro definitions of seed security—access to non-genetically modified and non-corporate seed—as well as household considerations about choice and ability to save seed for one's self and family. Catherine Keske explains:

> In addition to adequate biodiversity, we need competition in the seed market so that varieties that provide optimal health and taste benefits can be bought and grown by farmers.

They also included seed quality, access, and diversity, including access to seeds that are adapted to local conditions. Similarly, Katie Temple of WEC emphasized the value of having control of our own seed supply:

> When I hear the term seed security, what comes to mind is the security of our seed reserves and having good control over the seed we use so that we do not completely depend on external bodies, such as big corporations to provide seed. Seed security is partly environmental as it means that everybody has access to high quality and organic seed.

Respondents were also asked to comment on Newfoundland's specific seed security context. Among the six participants, there was general concern about seed security in the area. With the province's many agricultural challenges, there is more talk about seed security and food security in Newfoundland, and focus on supporting local agriculture.

With the province's many agricultural challenges, there is more talk about seed security and food security in Newfoundland, and focus on supporting local agriculture.

However, the respondents were unsure if large farms were saving seed, and indicated that genetically modified organisms could be a threat to seed security in the region. With focus on modern technologies and push for large farms, more commercial farmers are bringing in external seeds and inputs.

For recreational gardeners, seed security does not seem to be an issue because small amounts of seed can be easily purchased online and shipped to the island. Sometimes the variety of plants offered by local nurseries is somewhat limited. Trevor VandenBoer, Plot Coordinator at the MUN Community Garden in St. John's, explains these inconsistencies in the Newfoundland seed supply system:

> I'd say seed security is poor for this population as they depend on local businesses and few, if any, people understand or are willing to take the time to collect and store their own seed. From my experience getting non-commercial sets for onions and potatoes, the situation is even worse with supplies consistently not meeting demand on an annual basis in Newfoundland.

Trevor VandenBoer noted that local vendors have definitely improved the seed supply system in Newfoundland since 2012. These include gardening and seed-specific stores (The Seed Company by E.W. Gaze) and large box-mall vendors (e.g. Kent, Home Depot). Initially, these locations had poor offerings of variety and heirloom cultivars and farmers would resort to importing these from trusted vendors. Now many of these seeds can be found locally and there is an "obvious self-sufficiency movement", which includes seed saving, within the MUN Community Garden population and also the communities within and surrounding the St. John's area.

The majority of the respondents mentioned the need to invest some time in encouraging government, farmers, and organizational networks to work together in training efforts and educational seminars, which should be given during the off-season. Three of the six respondents were not aware of any significant efforts lead by the provincial government to enhance seed security, and indicated the need to educate more people on the importance of seed and seed diversification.

Participants suggested that increasing government support and investments in education resources and new agricultural seed policies, can positively affect the island's, and more generally the province's, current seed security situation.

> There is a need to educate more people on the importance of seed and seed diversification. There is value in local knowledge. It is vital for local communities to take charge of their local food systems. – Catherine Keske

> Nobody has made seed security a priority, therefore the government has received no pressure from consumers to invest in seed security or how to access better organic seed. – Katie Temple

Participants suggested that increasing government support and investments in education resources and new agricultural seed policies, can positively affect the island's, and more generally the province's, current seed security situation.

Though most respondents had a good grasp of the term seed security, and well-founded opinions on Newfoundland's situation, few indicated that they were involved with working on seed security issues. For example, Dr. Keske indicated no direct experience working on seed security related issues, however she is familiar with community clubs, such as the MUN Community Garden and Sarah Crocker at The Seed Library. She has also been in touch with researchers at Provincial Agri-Foods to discuss topics around food security and food sovereignty on the island.

Additionally, local nurseries and seed companies limit their involvements with seed security projects as they deal mostly with retail customers. Both The Greenhouse and The Seed Company have no seed security programs right now – their main focus being customer service, including research, and sales. Their customers include gardeners, farmers, as well as local seed savers. Kim Thistle explains:

> Few customers at The Greenhouse save seeds and enjoy finding and preserving more diverse species. These customers are more into trading and online sources; therefore, I limit my involvement because I deal mostly with retail.

Though there is little really significant seed security work being done right now, The Seed Company is evolving its business to suit the needs of this generation's "rubber boot gardeners" by bringing in new products such as organic fertilizers and locally made supplies. Jackson McLean explains:

"The biggest advantage of buying local is having seeds that are guaranteed to grow here." – J. McLean

> The biggest role that the Seed Company could play would be to provide a hub for people to save seed and bring local seed to us so that we can sell them to local farmers. We prefer to sell local seeds if they are available than have to import seeds.
>
> The biggest advantage of buying local is having seeds that are guaranteed to grow here. Ones that are pre-hardened to the conditions and the pests over generations become more hardy. Supporting the local economy is important.

Jackson is interested in doing more seed work—there is opportunity to buy local seeds and to sell them to farmers—however, the lack of local seed savers is a big barrier as supply for purchase is limited.

There is also strong interest from organizations like WEC to participate in more seed security work. WEC is involved with other groups, including Grenfell Campus Community Garden, Pasadena Garden, and Humber Heights Garden, though these groups do not have a big focus on seed saving. WEC is also involved with interested community members and home gardeners who attend their workshops.

In Fall 2014, WEC partnered with Food First NL to host a series of skill workshops, including one on seed saving. The workshop received funding from the TD Bank Friends of the Environment Foundation, as well as The Bauta Family Initiative on Canadian Seed Security. The workshop agenda comprised of an introduction to seed saving, followed by a history lesson on traditional Newfoundland food roots and 85 minutes of inclusive learning activities. The activities wrapped up with an evaluation questionnaire of the event to guide the way for future workshops (Root Cellars Rock, 2012).

Overall, the event was successful, bringing in lots of support and involvement from the community. Temple explains that she is unsure if people are saving seed, but they are more interested in having this conversation.

WEC indicated a strong interest in making this an annual workshop program, however there are some challenges and barriers, one of which is finding local resources and funding. Temple elaborates:

> There was interest and WEC wants to make this an annual workshop program – aiming for September – we will be looking for resources and ideas for that.

Trevor VandenBoer mainly interacts with recreational gardeners. His current seed work includes educating community garden members on seed production and seed saving:

> I teach people how to identify plants that are optimal for seed production and how to allow those plants to successfully produce viable seed. I also organize seed saving tutorials for garden members.
>
> I also collect, determine viability, store, and then package and distribute seeds saved at the MUN community garden from the seed saving plot or members' plants that have been selected for seed saving.

VandenBoer is interested in expanding his seed work, however access to productive land to dedicate to seed saving is an issue.

Section 2: Farmers and Seed Savers

This section presents a scan of current issues related to seed security and seed conservation in Newfoundland as experienced and understood by agricultural growers. Interviews were conducted with farmers and seed savers including questions related to seed saving, seed varieties, and seed banks. A total of four farmers and gardeners were interviewed. Part A provides an overview of the farmers and/or gardeners involved. Part B describes the interview findings, and expands upon any similarities or differences within the data set.

A – Overview

Table 2. List of Participating Farmer and/or Gardener Study Participants

Name & Location	Participant Description
Tom Loader Pouch Cove, NL	Loader is a fourth generation farmer with 20 years gardening experience. He currently works on The Organic Farm in Pouch Cove and has experience with other private garden work around town.
Annette George Corner Brook, NL	George has previous experience in organic farming and seed saving and currently owns a small horticulture operation, including an orchard with young trees (two-four years old). Annette's main focus is on community building, rather than profit, and having a positive impact in the community.
Don Bragg Mount Pearl, NL	Bragg has ten years' organic farming experience. He farms mixed livestock, vegetables, and grains.
Sarah Crocker St. John's, NL	Crocker is the market gardener at Seed to Spoon. Seed to Spoon sells a diversity of locally grown fresh crops to customers through the Community Supported Agriculture (CSA) program and the St. John's Farmers' Market. The organization supports innovative and sustainable food production that benefits the health of their customers, community and environment. https://www.seedtospoon.ca

B – Interview Findings: Insights & Trends

Of the four farmers interviewed, three respondents indicated that they practice some seed saving, and the remaining participant is very eager to start. There were some similarities of seed varieties saved by farmers, including different varieties of potato, vetch, parsnips, turnip, various legumes and beans. In several cases, seed saving has traditionally been a part of their farming lifestyle, a practice passed on from generation to generation. Some of the main reasons farmers cited for saving seed are to promote crop biodiversity, to continue growing heirloom varieties that are adapted to Newfoundland's climate, and to save money.

For Annette George, seed saving means collecting seed to conserve seed biodiversity, to build the soil, and to save native varieties of potato, which she preserves in the cold room in her house. She explains:

> Yes, I save seeds. Not on the level that I'd like to, but getting there. My family has been saving seeds for many years. My home community saves a particular variety of potato called the McIver's Red Potato, which has been planted by my ancestors for quite some time.

George also collects seeds from wild mustard, vetch, and lupin, among others, which were planted at her orchard in spring.

For George, seed saving means collecting seed to conserve seed biodiversity, to build the soil, and to save native varieties of potato.

Similarly, organic farmer Don Bragg has been seed saving for five years, including different varieties of Newfoundland potatoes. He explains that saving seed can be cost effective as seed pricing can be quite high:

> Yes, we do save seed. We save potato seed, garlic bulbs, parsnip seeds – pretty much everything else we purchase. When purchasing seed, we normally buy bulk order through Veseys Seed, which is located in Prince Edward Island (PEI). But even buying from wholesale can be expensive with shipping and handling fees.

Three years ago, Sarah Crocker became more interested in seed saving when she started Seed-to-Spoon. The need to grow different varieties in a cost effective way influenced her decision to start saving seed. Being in Newfoundland and using so many different varieties of seed was not financially feasible as the seed costs were "through the roof". Quests for varieties that do well in Newfoundland's climate, in addition to her advocacy for seed

sovereignty and the farmers' right to save seed, also impacted her decision to start saving seed.

She began by saving her own bean seed, which is an easier crop. Now she saves seed from kale, radish, tomatoes, flowers, dill, some kinds of greens, wheat, barley, and quinoa. She sometimes saves perennial seeds like chives.

Generally, the farmers agreed there is good access to seed because they can source seed online from companies, such as Veseys and West Coast Seeds. The majority of farmers interviewed try to support local suppliers in the area as much as possible, including The Seed Company in St. John's, The Greenhouse, and local seed savers, though it is common to source from other provinces to buy seed not available in Newfoundland. Because varieties are not developed or maintained in Newfoundland getting seeds that are well suited for the climate can be difficult.

There is good access to seed because farmers can source seed online from companies.

Overall, the interviews illustrate a demand for locally sourced seed. All participants indicated that they would rather source seed locally than from other provinces or countries.

Among the interviewees, three out of four participants said that there is a good selection of seeds available for purchase. Seeds are generally available at the quality and quantity farmers want and need, however, many seed varieties were considered to be very expensive.

> There is no problem in terms of getting the seeds, seed access is pretty good. Pricing is one issue, however, as a lot of varieties are very expensive, pepper seeds for example. – Tom Loader

> One issue is the price of some seeds – add shipping costs and some of them tend to be a bit costly. – Don Bragg

> Ordering seed is incredibly expensive – even from local suppliers – and ordering wholesale is still cost ineffective to receive orders on the island. Seeds that are not traditionally planted in Newfoundland are pricey, such as cover crops, buckwheat, mustard and clover. The market is extremely volatile – there is a need to provide some stability in the market. – Annette George

> Yes, it is easy to connect with other small scale growers to find very unusual seed. However, this may be kind of expensive and it is going to be pretty small. I could imagine that it would be more challenging for large scale farmers, 20-25 acres and up to find seed in the quantity they are looking for. – Sarah Crocker

Discussions with farmers reveal that the disappearance of local varieties and erosion of genetic diversity are of concern. It was noted that many farmers would like to have a source of potato seed that is readily available on the island and that there are a number of varieties that work and have worked in the past in Newfoundland. However, farmers indicated these hardy heritage varieties are under the threat of extinction, including the McIver Red potato.

The disappearance of local varieties and erosion of genetic diversity are of concern.

Annette George is concerned for this variety as few people save the McIver Red potato in her community these days. According to George, the decline in seed saving can be attributed to the aging population and the general lack of interest in agriculture among the youth. She says her grandfather is aging, and the younger generations show less interest in agriculture. She is worried about losing this breed of potato, which they always had so close to home. She says it only takes a new generation that chooses to buy seed from big places like Canadian Tire to stop growing this breed. George elaborates:

> This would be a huge loss for the next generation as it is a hardy cultivar and heritage variety that works well in Newfoundland's rough climate and not so ideal soils.

George plans to get seeds from her great uncle who currently still plants and gets stocks from this variety. When asked what varieties conservation efforts should focus on, she said:

> Newfoundland heritage breeds for sure. If you dig a bit deeper into small communities, not even agricultural communities, you might find more of these heritage breeds, whether it be turnip or potatoes, we need to look into this more and ensure these are conserved. We've lost so many varieties and heritage breeds already and they are forever lost.

In addition to the potato seed, cover crops were also identified as important crops to have in Newfoundland. These include oats, mustard because of good pest control, and other legumes like vetch, white clover, red clover and buckwheat.

> Buckwheat would be highly useful but prices are really high. Oats are very reasonable because they are brought in for feed for horses so you are able to get it.

Finally, all interviewees were asked about the value and feasibility of setting up a seed bank in NL to serve growers there.

While it would be valuable to have a seed bank in Newfoundland, it may be an expensive endeavor and unrealistic project for the province.

The majority of respondents thought that while it would be valuable to have a seed bank in Newfoundland, it may be an expensive endeavor and unrealistic project for the province. A seed bank would be valuable for long-term seed security planning. It would also be a good educational tool. However, most respondents were unsure of the logistics of running a seed bank, and the region's small size and population could indicate little demand for a seed bank in Newfoundland right now.

> At this time, I think there is a lot of experimenting going on with new options for edibles being grown in Newfoundland. However, given the costs associated with running a true seed bank (e.g. temperature controlled buildings with routine inspections and confirmation of seed viability), I don't think it is something this province should be investing in, but an undertaking that should span the Canadian Atlantic Provinces in a collaborative effort. – Trevor VandenBoer

> Oh my goodness, yes it would be valuable! We need to encourage more agriculture and more sharing of agricultural knowledge in Newfoundland. We need to push the envelope on that for sure because right now we are so far behind. – Annette George

> I think it would be good. Cost is obviously a factor with how much to maintain a seed bank. Easy access to seed, which is good for our environment and costs as well. – Don Bragg

> Yes, a seed bank would be valuable. It is definitely important to maintain varieties that work well in and optimize Newfoundland's climatic conditions. – Tom Loader

> Newfoundland doesn't really need a seed bank. It would be extreme overkill to have a seed bank in Newfoundland. – Sarah Crocker

> I don't right now. Is there a large demand for this activity to take place? I really don't see it but perhaps in a larger center like St. John's, it exists. I would love to see ACORN use its lobbying powers to support the organic movement here instead, so that it is an economic advantage to be organic and get certified. Right now, there is no real demand. – Kim Thistle

Conclusion

The agricultural industry in Newfoundland faces many challenges, from short growing seasons to harsh climatic conditions in the winter months. With these challenges, there is general concern from many groups (CSOs, community organizations, academia, farmers, and gardeners) about achieving food security and seed security in the province. The ten interviews conducted found that the majority of respondents have a good understanding of seed security – illuminating the need to have an adequate seed supply for the future. There is great interest in doing more seed security work, such as educating the general public through annual workshops on saving seed. Some challenges to hosting these types of events include finding local resources and funding.

The demand for locally sourced seed is significant as all participants indicated that they would rather source seed locally than from other provinces or countries. Barriers to buying local seed include few farmers saving seed for purchase and high seed costs. Overall, there is good seed access on the island and seeds are generally available at the quality and quantity farmers want and need, however, many seed varieties are considered to be very expensive.

Discussions with farmers reveal concern for endangered local varieties and erosion of genetic diversity. In particular, farmers would like to have access to a Newfoundland heritage potato seed that is readily available for purchase on the island. Seed banks are valuable for long-term seed security planning, however the feasibility of having a seed bank in Newfoundland is undetermined and thought to be an expensive project for the province. The demand for a seed bank in Newfoundland is also unknown with the expectation of greater success in a more densely populated place like St. John's. Future directions can include increased assistance to local organizations (access to local resources and funding),

as well as implementing small scale seed banks across the island or the province. Also, a larger seed bank shared across Atlantic Canada may be more cost effective.

Study Limitations

Recruitment took place during summer months—a very busy time for growers and others—which impacted uptake, resulting in a relatively small sample size. This report will serve as the basis for further consultation by ACORN with these groups in Newfoundland. As such, it is not comprehensive or conclusive, but rather the start of a well-rounded exploration of these issues on the island.

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Appendix A – Interview Guide (Part 1)

Introduction

1. Introduce myself and ACORN.
2. Explain the purpose of the interview.
3. Explain the interview format – indicate interview length (approx. 45-60 minutes), the note taking, terms of confidentiality, and the opportunity for the interviewee to ask questions before and after the interview.

Are you familiar with ACORN?

ACORN stands for the Atlantic Organic Regional Network. It is a non-profit organization that promotes organic agriculture on all levels, from seed to farmer to consumer. ACORN is involved in various projects that focus on seed security both regionally and nationally. ACORN's Atlantic Canada Program is called The Bauta Family Initiative on Canadian Seed Security and was launched in 2013 to conserve and advance seed biodiversity and seed security in the Atlantic region.

Purpose
Have you had a chance to read the consent form? If not, would you like to read it now or for me to guide you through the key points?

The purpose for this interview is to gather some basic information about what is happening with seed work in Newfoundland. ACORN's seed program is looking to increase the work its doing in Newfoundland and we want to make sure we're consulting with people in Newfoundland before we proceed with projects.

At the end of this research we hope to have a review of current seed security work in the province and maybe a list of people to partner with. We're also hoping to assess the potential to expand seed and agricultural biodiversity conservation work in the province.

Do you have any questions before proceeding with the interview questions?

The report I write will end up guiding some of ACORN's projects in Newfoundland.

Appendix B – Interview Guide (Part 2)

Interview Questions for Community Groups, CSOs, Government Reps, Academia Reps, Community Members

Rapport Building Questions

1. How long have you lived in Newfoundland?
    a. Are you originally from Newfoundland?

2. Can you give me a snapshot of what you do? For how long have you been doing that? What is your interest in Seeds and Biodiversity in Newfoundland?

Questions Related to Seed Work

1. Are you familiar with the term seed security? What does that mean to you?
    - ***Seed Security*** exists when men and women within the household have sufficient access to quantities of available good quality seed and planting materials of preferred crop varieties at all times in both good and bad cropping seasons (Access, Diversity, Availability).

2. What kind of work do you do/programs or projects do you run that have to do with seeds and seed security?
    a. Primarily who do you serve/engage with in this work?
    b. Do you know of anyone doing seed work that we should include? Primarily who do you engage with?
    c. If no…… Do you ever work with anyone – farmers, seed companies for example – who work with seeds?

3. From your experience, how would you rate/describe seed security on Newfoundland?

4. In your experience what are some target issues within the farming/seed system that impact your assessment of seed security in Newfoundland?
    Prompts:
    a. Is seed access a key issue impacting seed security in Newfoundland?
    b. Is seed diversity…?
    c. What about skills of seed savers and farmers…?

5. Are you aware of efforts to improve the seed system in Newfoundland? If so, can you tell me a little more about these efforts. If not, where do you think an investment or an effort could be made to enhance seed security in the area?

6. Are you interested in expanding into doing (more) seed work?
    a. If so, what are your opportunities and barriers to doing that?

7. This is one area that ACORN is expanding on in Newfoundland. Based on your experience and your work, do you think it would be valuable to have a seed bank in newfoundland? Why or why not?

Closing Questions

8. Do you know of others we should contact as part of this work?
    a. People who are working on seed issues?
    b. People who are working with farmers, gardeners, or seed savers?

Interview Questions for Farmers and Farmer Groups

Personal and Rapport Building Questions

1. How long have you lived in Newfoundland?
    a. Are you originally from Newfoundland?

2. How long have you been farming in Newfoundland?

Questions About Seed

1. Do you save seed?
    a. How long have you been saving seed?
    b. Why do/don't you save seed?

2. Is seed readily available? Can you access the seed you want easily? Tell me a bit about that.
    a. Where do you source your seeds?
    b. Do those sources meet all of your needs? Why or why not?
    c. Are seeds available at the quantity and quality you want?
    d. Are seed prices within the realm of your ability or willingness to pay?
    What about seed prices? how would you describe seed prices? are seed prices a factor when you source seed? etc.

Questions About Seed Varieties

1. What varieties of vegetables or grains are important to you? What works really well on your farm/ in your climate? (are there any particular varieties that you really love, etc.

2. Do you know if any of those varieties are open pollinated? (Definition of OP and Hybrid handy for myself) Do you grow open pollinated seeds or hybrids? If hybrids, would you consider growing OP?

    - ***Open-pollination*** is when pollination occurs by insect, bird, wind, humans, or other natural mechanisms.
    - ***Hybridization*** is a controlled method of pollination in which the pollen of two different species or varieties is crossed by human intervention. It can occur naturally through random crosses, but commercially available hybridized seed (often labeled as F1) is deliberately create to breed a desired trait.

3. What varieties would you like conservation efforts to focus on? If unknown, would trailing help?

Questions about seed banks

1. What is your understanding of seed banks and seed libraries? (definitions available)

    - ***Seed banks*** store seeds to preserve genetic diversity; hence it is a type of gene bank.
    - ***Seed libraries*** are institutions that lend or share seeds. It is different from a seedbank as it is not intended to store or hold germplasm. Seed is maintained through public donations and is distributed back to the public which preserves the shared plant varieties through further sharing of seed.

2. Have you ever accessed seed from a seed bank or seed library?

3. Do you think it would be valuable to have a seed bank in Newfoundland? Why or why not? Other general interest?

Appendix C – List of Interviewees

1. Dr. Catherine Keske, Grenfell Campus at Memorial University, Corner Brook, NL
2. Katie Temple, Western Environment Center (WEC), Western NL
3. Kim Thistle, The Greenhouse, Little Rapids, NL
4. Trevor VandenBoer, Memorial University of Newfoundland Community Garden, St. John's, NL
5. Jackson McLean, The Seed Company by E. W. Gaze, St. John's, NL
6. Tom Loader, Pouch Cove, NL
7. Annette George, Corner Brook, NL
8. Don Bragg, Mount Pearl, NL
9. Sarah Crocker, St. John's Seed Library, and Seed to Spoon Farm, NL