

# Our Food, Our Future.

*Growing the Agriculture Industry in Newfoundland & Labrador*



*Innovative Agricultural  
Research*

*Provincial Agricultural  
Research Priorities*

*Fostering Partnerships  
And Next Steps*

**- Proceedings -**

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# Acknowledgements

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## Partners

Department of Natural Resources, Forestry and Agrifoods Agency, Production and Market Development Division

Grenfell Campus, Memorial University of Newfoundland

Research & Development Corporation of Newfoundland and Labrador

Agriculture and Agri-Food Canada

## Organizing Committee



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Labrador



# Preface

The Provincial Agrifoods strategy “Our Farms, Our Food, Our Future” provided the context for this one day event in Corner Brook, NL and is the foundation for the continuous growth of the agriculture industry in Newfoundland and Labrador.

Innovation, diversification, expanding markets and research and development are catalysts for future growth for Newfoundland and Labrador’s agriculture industry. Although research has become a more integral part of the Agrifoods Development Branch in recent years, this is the first time that we have held a symposium of this magnitude. Grenfell Campus, Memorial University is hiring agricultural research professors and building laboratory facilities. This event was timely in considering the future direction of agricultural research and the growth of the sector in Newfoundland and Labrador. These proceedings could be considered an exciting reflection of the diversity of agricultural research that is currently occurring in the province as well as the various partnerships and capacity for partnership potential that exists. The work presented and discussed indicates that agricultural research is a requirement that is finally being recognized in Newfoundland and Labrador. It is our hope that this symposium and these proceedings will inspire more discussion and collaborations to identify and carry out the research that is needed to move the agricultural industry to a sustainable, profitable industry in Newfoundland and Labrador.

We would like to acknowledge the input and support of several individuals and organizations. We would like to thank all of the conference delegates who attended the symposium and especially those who shared their work. On November 23rd, 2012 we were pleased to welcome Dr. Gary Kachanoski, President of Memorial University of Newfoundland who provided opening remarks. The first symposium of its kind in Newfoundland and Labrador included delegate presentations from Agriculture and Agri-Food Canada, Research & Development Corporation, Department of Natural Resources and The Newfoundland and Labrador Federation of Agriculture as well as 25 poster presentations from government researchers, academics, and students. We were pleased to have Dr. Richard Donald from Dalhousie University, Faculty of Agriculture whose keynote presentation on “Getting Aligned on Agriculture in Atlantic Canada”



which set an inspiring tone for the panel discussions that followed. Finally, we are very grateful to the Department of Natural Resources, Research & Development Corporation and Grenfell Campus, Memorial University who were involved in the planning and provided funding for the event.

More than 100 people representing industry, government, academic, NGO's, and university students attended the event. There was tremendous interest in this symposium but due to space restrictions some people could not be accommodated and therefore were unable to participate. Media coverage included NTV news, CBC and CFCB radio interviews and a Western Star article.



# Our Food, Our Future

*Growing the Agriculture Industry in Newfoundland & Labrador.*

## Agenda

November 23rd, 2012 Greenwood Inn, Corner Brook

**8:15** | Registration & Continental Breakfast

**9:00** | Welcome

**Dr. Gary Kachanoski**

President, Memorial University

**9:15** | Opening Presentations

**Krista Quinlan**

VP, Policy, Evaluations and Government Relations,  
Research & Development Corporation

**Sandy Todd**

Research Manager, Agriculture and Agri-Food  
Canada

**Dave Jennings**

Director, Department of Natural Resources

**Eugene Legge**

President, Newfoundland & Labrador Federation  
of Agriculture



**10:15** | *Networking Break & Poster Session*

**10:45** | Viability of Cereal Cultivation for Animal Feed Production in Insular Newfoundland

Dr. Vanessa Kavanagh, Cereal Grain Research Specialist, Department of Natural Resources

**11:05** | Cool Climate Berry Crop Production and Protection in Newfoundland & Labrador

Dr. Samir Debnath, Research Scientist, Agriculture and Agri-Food Canada

**11:25** | Animal Disease Research in Newfoundland & Labrador

Dr. Hugh Whitney, Director, Animal Health Division, Department of Natural Resources

**11:55** | *Networking Break & Poster Session*

**>>> Lunch 12:30 – 1:30**

**1:30** | Keynote Address

Dr. Richard Donald, Associate Dean, Dalhousie University – Agriculture Campus

**2:10** | Panel Question & Answer Session

Dr. Gary Kachanoski / Dr. Richard Donald/ Krista Quinlan/ Dr. Christiane Deslauriers/  
Dave Jennings/ Eugene Legge

**4:00** | Next steps and Closing Remarks

Dr. Antony Card, Associate Vice President (Research - Grenfell Campus)/ Dave Jennings,  
Director, Production & Market Development Division

*Thank you for making this Symposium a success!*

“Our Farms, Our Food, Our Future”, outlines the Government’s commitment to building an innovative, profitable and sustainable agriculture industry for Newfoundland and Labrador. This provincial strategy provided the context for “Our Food, Our Future – Growing the Agriculture Industry in Newfoundland and Labrador”.

This one day symposium provided the opportunity for academic leaders, producers and agricultural experts from various institutions to come together and highlight current agricultural research within the Province of Newfoundland and Labrador, as well as to identify opportunities to help strengthen agricultural production and lead the province toward an innovative, profitable and sustainable agricultural industry.

## **Symposium objectives included:**

- > To highlight current agricultural research being conducted within the Province
- > To establish a shared understanding of provincial agricultural research priorities
- > To foster partnerships among various agencies and organizations
- > To identify next steps and actionable items to be included in a NL Agricultural Research Strategy

The Forestry and Agrifoods agency along with Memorial University of Newfoundland and the Research & Development Corporation partnered for this event. The symposium’s emphasis was on sustainable livestock/crop production, livestock/crop diversification, animal health and disease. Guest speakers included: Dr. Gary Kachanoski, President of Memorial University of Newfoundland, who provided warm greetings and a very promising message about the foreseen growth at Grenfell campus; Dave Jennings, Director of the Production and Market Development of the Forestry and Agrifoods Agency; Sandy Todd, Research Manager with Agriculture and Agri-Food Canada; and Krista Quinlan, VP, Policy, Evaluation and Government Relations with Research & Development Corporation who all talked about the group they represent, what types of research that they are involved in as well as the programs and services that they offer that could contribute to agricultural research and development projects.



# Introduction

Dr. Richard Donald, Associate Dean, External Relations and Strategic Partnerships and Interim Associate Dean, Research at Dalhousie University, Faculty of Agriculture was the keynote speaker whose presentation entitled “Getting aligned on Agriculture in Atlantic Canada” discussed an Atlantic research and development partnership approach in strengthening a sustainable agricultural industry in Newfoundland and Labrador.

A panel discussion and poster sessions sanctioned opportunity for questions, networking and discussions (Poster Abstracts in Appendix A).



## About the proceedings

The intention of producing this proceeding is to capture and summarize participants input in the panel session, the comment form and to identify next steps and priority agriculture research areas.

## Summary of Key Issues – Panel Sessions

Invited panel members included; Dr. Richard Donald, Dalhousie University, Faculty of Agriculture, Dr. Gary Kachanoski, MUN, Eugene Legge, Newfoundland and Labrador Federation of Agriculture, Dr. Christiane Deslauriers, Agriculture and Agri-Food Canada, Krista Quinlan, Research and Development Corporation, and Dave Jennings, Natural Resources.

*The panel discussion was aimed to provide an opportunity for the audience to hear from and discuss with the invited presenters whom are very familiar with agricultural issues and research opportunities in Atlantic Canada and specifically Newfoundland and Labrador. The panel discussion clarified and increased participants knowledge and understanding of Newfoundland and Labrador agriculture, where it ranks in terms of agricultural production compared to the rest of Atlantic Canada, and the challenges that we have as a Province that has only been producing food commercially for 50 years. This session also identified how collaborations and partnerships provincially and within Atlantic Canada may work together to build this industry to make it more sustainable and profitable in the years to come. It was noted that this was the first time that these individual groups and agencies have been brought together to have the types of discussions that occurred.*

Dr. Christiane Deslauriers and Dr. Gary Kachanoski had opportunity to discuss their personal perspectives on agricultural research and what is needed to increase research and development capacity here in Newfoundland and Labrador. Dr. Deslauriers started the session off by saying that within Atlantic Canada we all have different challenges and opportunities that need to be recognized. We need to find a way to access more funding for research. She also said that we have the strategic vision and understanding of current technologies; we must now adapt or adopt them to make it work within our Atlantic Provinces. Where we have no knowledge, this is where research fits.

Three general themes arose from the hour and half long panel session. These were; farmers markets, food security, and new entrants. Other topics included; aging population, land acquisition, and regulations for small farms.

## Summary of Key Issues – Panel Sessions

Farmers' markets encourage local food security through their promotion and support of local food production; albeit, production will need to increase in order to supply the demands for local food. There was a lot of discussion around food security and producing our own food before it is exported. While there is a place for exports and secondary processing which in turn create revenue for the Province, the panel members reiterated that we need to increase production. It was also suggested from producers that perhaps it is not just increased production that is needed, but actually storage and marketing that is required.

New entrants and aging farmers is a concern for sustaining and growing the agricultural industry in NL. What will the farming sector look like in 10 years time when most of the current farmers are retired? It was discussed that agriculture/farming as a career does not have a strong appeal as does becoming an environmental scientist or a veterinarian, for example. Given Newfoundland does not have the means to educate our youth on agrology as does Nova Scotia and Prince Edward Island, we are at a disadvantage for promoting agriculture as a career path. Dr. Kachanoski talked about the capacity building that is ongoing at Memorial's Grenfell Campus and the goal of having graduate students working on agricultural research in the near future. Agricultural education does not start in a university setting, it starts with our children. We must educate them on where their food comes from, how to grow and prepare fresh produce, and to not rely on the cheap, easy processed food. Eugene Legge talked about the "Agriculture in the Classroom" program that the Newfoundland and Labrador Federation of Agriculture is spear heading as a pilot project in select schools across the Province. It was suggested that all schools should have a garden or a greenhouse and that agriculture and food production should be included in the curriculum.

To address this issue of aging farmers and new entrants, Dave Jennings commented that through Growing Forward Programs (a Provincial/Federal government cost shared program) there is a "Future Farms Initiative" that provides funding for new entrepreneurs, investments, mentorships, and succession planning. Another part of this issue is land acquisition. Currently, this process takes over 2 years and is something that must be



## Summary of Key Issues – Panel Sessions



simplified and more timely. Dr. Donald talked about groups of young farmers throughout Canada who are interested in diversification, greenhouse technologies and growing food under more controlled environments. It was suggested by a participant that more research is needed in these areas and funding programs should be in place for these small diversified farms.

There was a consensus among the group that both small and large farms are required to improve food security in this Province. It was identified that there are regulation challenges for small farms and that it is very difficult for small farms and new entrants to access funding, to start a new farm and to be sustainable and profitable. The new entrants programs are designed for existing agricultural business, and there are no programs designed for a person who is interested in starting to farm.

The Provincial government is committed to growing the agricultural industry to feed the people of Newfoundland and Labrador. Research and collaboration is the driving force for this action. Some specific research priorities that were highlighted during the panel session were: producing grain for the dairy and poultry industries; new and innovative technologies; greenhouse production and growing food in more controlled environments; renewable energy (agriculture waste as an energy source); climate change; vegetable storage; and new crop varieties. Through collaborative efforts, research in all these areas is possible and will allow us to enhance our local food production and educate the people of this Province on the importance of agricultural sustainability.

# Summary of Comment Forms

There were 102 people registered for the symposium: 52 government employees; 32 industry representatives; 8 academia; and 10 students. (See Appendix B for participant list).

We received 32 comment forms. 40.6% from government employees, 6.3% from industry, 37.5% from the academic community; and 3% from students.

## **1. Did the presentations and following discussions give you a better understanding of the agricultural research and development initiatives in Newfoundland and Labrador?**

A majority of the participants felt that the presenters brought clarity to many agricultural issues in Newfoundland and Labrador. Many felt that the symposium highlighted the extent of the research that is underway and it helped people better understand what activities are currently being conducted to promote food safety, food security, livestock and feed grains. Other words used to describe the presentations were; informative, enlightening, insightful, excellent, interesting, and diverse.

There was a comment that noted that it would have been useful to have more active participation from industry clients and that relevance to industry was only evident in a few presentations.

## **2. What do you see as agricultural research priorities for Newfoundland and Labrador?**

There was significant feedback on this question. In no specific order comments are summarized as follows: more funding is needed for research; research priorities should come from industry; there should be more funding programs to encourage farmer/industry partnerships for secondary processing; new farm/farmer initiatives both for small and large scale farms; specific adaptive research related to our climate and soil characteristics; food security; innovative technologies; sustainable practices; land use

# Summary of Comment Forms

planning; small farm developments; climate change; new crop varieties; value added opportunities; non-traditional high value agriculture products; decreased cost of production; improved profitability; organic agriculture; crop diversification; greenhouse technologies; vegetable storage systems; waste and nutrient management; grain and forage production; new entrants; and disease resistance .

## 3. What research collaborations can be identified from this symposium?

It was identified from the comment forms that the partnerships that need to be established are between public communities (NGO), industry, academic institutions such as Memorial University of Newfoundland, Dalhousie University and the Atlantic Veterinary College as well as Federal and Provincial government agencies. There were a few comments stating that this symposium made industry more aware of the role that academic institutions can play.





## Next steps

**“Our Farms, Our Future, Growing the Agriculture Industry in Newfoundland and Labrador”, captured through these proceedings, provided a wealth of information that will be useful for developing an Agriculture Research Strategy.**

The Department of Natural Resources, Agrifoods Development Branch, Production and Market Development Division will continue to lead the Agriculture Research Strategy but will require the continued involvement and collaboration with the multi-sector community (other government departments, industry, universities and NGO) as was highlighted in this symposium. As a next step action item, an Agriculture Research Advisory Committee (ARAC) will be established to guide and set priorities for agricultural research in this Province. This committee will create the framework for the Agriculture Research Strategy, using the proceedings as guidance and will present a draft to Symposium participants for feedback.

*Newfoundland and Labrador agricultural industry faces many challenges. The efficiencies and increased productivity necessary to meet these agricultural challenges cannot be achieved without a renewed focus on research. Access to funding was identified as the number one concern facing the growth of the agriculture industry in NL. Adequately addressing key research priorities will require significantly more resources. Forming partnerships with those identified above will greatly enhance research abilities and our capacity to leverage the funds required to conduct agricultural research specifically for Newfoundland and Labrador.*

This symposium will be a bi-annual event going forward. As was indicated earlier, this was the first time that individuals from the various organizations have been in the same room to discuss agriculture and the momentum will only continue to grow as partnerships are established. Symposiums such as this will provide the opportunity to remain current on research activities, knowledge transfer, networking and partnership building.

## Presentations and Abstracts

> *Dr. Vanessa Kavanagh. PhD, PAg*

### Presentation Title

Viability of Cereal Cultivation for Animal Feed Production in Insular Newfoundland.

### Abstract

Newfoundland and Labrador (NL) experiences unique agricultural challenges for cereal cultivation. Approximately 2% of the land is suitable for agricultural production, and growing seasons are short. There are no commercial cereal producers in NL and in 2011 ~47,000 tonnes of cereals were imported, making it one of the greatest farm expenses. The objective of the Alternative Feeds Program (AFP) is to identify cost-efficient and high-energy feeds suitable for NL livestock industries.

The AFP is currently in the first year of a multi-year program to assess the viability of cereal cultivation (barley, oats, triticale and wheat) for animal feed production in insular Newfoundland using small plot and large on-farm trials on the East and West coasts. Small plot spring cereal varietal trials were conducted in Summer 2012. All varieties reached maturity with barley maturing first and oats and triticale last. Preliminary results indicate barley and oats may be more promising for spring planting. However, extreme drought conditions experienced during the growing season suggest results may not be typical. Winter cereal trials were initiated in September 2012 on 100 acres across 5 sites. Harvest will be completed in August 2013 and straw yield, grain yield and nutritional content will be assessed.



## Presentations and Abstracts



> *Dr. Samir C. Debnath, PhD, PAg*

### Presentation Title

Cool climate berry crop production and protection in Newfoundland and Labrador.

### Abstract

An improved understanding of the important role of dietary fruits in maintaining human health has led to a dramatic increase of the global berry crop production. Berry fruits contain relatively high levels of vitamin C, cellulose and pectin, and produce anthocyanins which have important therapeutic values, including antitumor, antiulcer, antioxidant and antiinflammatory activities. Significant progress in micropropagation and molecular analysis combined with classical breeding (crossing and

clonal selection in wild germplasm) and a growth parameter study under greenhouse and field conditions has been achieved at the Atlantic Cool Climate Crop Research Centre at St. John's, with cool climate berry crops. In addition, progress is ongoing in assessing blueberry hybrids developed at the centre, for resistance/tolerance to key insect pests.

Lowbush blueberry, partridgeberry (lingonberry) and cranberry are three health promoting berry crops native to Newfoundland and Labrador. This province is the largest North American partridgeberry producer. Blueberry is the most important small fruit crop in Canada followed by grape and cranberry. Canadian fruit growers reported sales amounting to \$753 million in 2011, up 14.3% from 2010. Most of this increase was attributable to blueberry (up 36.4%) and cranberry (up 25.7%) sales. Hybrids between half-high blueberries (hybrids between highbush and lowbush blueberries) and selected lowbush blueberries have tremendous prospects for commercial cultivation in Canadian cool climates. This review presents the progress in-depth of various aspects of berry crop improvement, production and protection systems for Newfoundland and Labrador.



> *Dr. Hugh Whitney*

## Presentation Title

Animal Disease Research in NL

## Abstract

Research into animal diseases is of value for many reasons. In the context of commercial agriculture, preventable diseases are an economic loss to farmers if the scientific and technical knowledge is not available to understand where the losses occur and how they can be reduced (e.g. Aleutian disease of mink, Johne's disease in dairy cattle, Klebsiella mastitis in dairy cattle). In the context of public health, there are many human diseases that are spread by animals (e.g. West Nile virus, rabies, Lyme disease) or which originate in animals but through a series of events become adapted to human hosts and are then spread from person to person (e.g. influenza A virus). In the context of climate change, there are animal diseases that are known to exist elsewhere and which are currently not known to exist in our province but with a warming climate may in the future become established diseases. Insect-borne diseases are the common ones of concern for climate change. The presentation will highlight past, present and future research into these different types of animal diseases.



## Poster Presentations

### Production assessment and improvement of Newfoundland and Labrador swine herds

> **A. Madore**

Department of Natural Resources, Corner Brook, NL (aftonmadore@gov.nl.ca)

In Newfoundland and Labrador, pork production has seen a drastic decline of nearly 90 percent over the last two decades. With the closing of the provincial swine breeding operations, new genetic stock has not been readily available to producers. Rising feed costs encourage producers to minimize expenses, while producing a quality product in minimal time. One producer is using bakery waste as an energy component for feed. This project seeks to gain benchmark performance records for local stock, and compare assorted variables to imported stock. The objectives are to grow gilts to breeding weight, breed, and analyze litters of local versus imported gilts. Prime indicators of performance will be analyzed on weaned piglets, comparing; average daily gains and feed conversion ratios when comparing 2 diets: use of bakery wastes, and commercial complete feed.

### Spatial habits and generation development of the lesser house fly (*Fannia canicularis*) in Newfoundland and Labrador mink facilities

> **A. Madore**

Department of Natural Resources, Corner Brook, NL (aftonmadore@gov.nl.ca)

The lesser house fly (*Fannia canicularis*) in fur facilities throughout Newfoundland and Labrador (NL) has been creating nuisance concerns on neighboring properties. A concern by both professionals and producers is lack of scientific studies and a lack of chemicals registered for use in livestock barns (when animals are present) to control the pest. By determining the population dynamics, generational development and fly behavior, timing and placement of chemical control methods may be optimized. 2012-2013 will be the first of a multi-year study of targeted chemical control of

the lesser housefly. The objectives of the 2012-2013 project are to determine the number of fly generations per season, correlate fly age/development with temperature in the fur sheds, determine the age and associated flying/resting behaviors, complete research on chemicals that may be used to control fly populations in fur facilities and test dosage of assorted chemicals to determine LD50 (dosage level to kill 50% of subjects). After initial fly behaviors are analyzed, potential methods of control will be analyzed; such as the use of trap boards and dangling cotton ropes infused with insecticide. Thus, alternative chemicals could be utilized, and better IPM techniques developed.

### Row covers as physical barriers to control cabbage maggot (*Delia radicum*) in rutabaga

> **L. Madore<sup>1</sup>, P. Dixon<sup>2</sup>, S. Fillmore<sup>3</sup>, S. Leblanc<sup>4</sup>, S. Mellish<sup>5</sup>, J. Owen<sup>4</sup>, C. Parsons<sup>2</sup>, R. Pemberton<sup>3</sup>, T. Power<sup>2</sup>, V. Zvalo<sup>6</sup>**

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<sup>6</sup>Agrapoint, Truro, NS

The cabbage maggot, *Delia radicum*, is one of the most damaging pests to cole crops in Newfoundland and Labrador (NL). Small amounts of tunneling in rutabaga render the crop unmarketable. There is one registered pesticide (chlorpyrifos) to control cabbage maggot in cole crops; resistance has been reported. The objective of this project is to evaluate cabbage maggot control (row covers) technology. During the 2011 and 2012 growing season, a field trial was conducted at multiple sites in Atlantic Canada to determine the efficacy of row covers as physical barriers to control *Delia radicum* L. The trial compared the effectiveness Wondermesh<sup>®</sup> and ProtekNet<sup>®</sup> row covers to an untreated check as well as to the commercial standard pesticide. In 2012, weed management strategies for row covers were assessed. In 2011 and 2012



rutabaga was seeded or transplanted and covered within one week. These fields had history of pest pressure. Sites were monitored for the presence of adult cabbage maggot and weeds. At harvest, rutabagas from each treatment were assessed for cabbage maggot damage to determine the efficacy of the covers. Assessment results showed that both Wondermesh and ProtekNet row covers protected the rutabaga crop from cabbage maggot. Weed growth was problematic throughout the Atlantic Provinces. Results from the 2012 growing season are currently being analyzed for crop growth and cabbage maggot damage across all treatments.

### Exclusion fencing as a physical barrier to control cabbage maggot (*Delia radicum*)

> **L. Madore<sup>1</sup>, P. Dixon<sup>2</sup>, C. Parsons<sup>2</sup>**

<sup>1</sup>Department of Natural Resources, Corner Brook, NL (leahmadore@gov.nl.ca)

<sup>2</sup>Agriculture and Agri-Food Canada, St. John's, NL

The cabbage maggot, *Delia radicum*, is a serious pest of cole crops. Small amounts of tunneling in rutabaga render the crop unmarketable. There is one registered pesticide (chlorpyrifos) to control cabbage maggot in cole crops; resistance has been reported. The objective of this project is to evaluate cabbage maggot control (exclusion fencing) technology. Theory of exclusion is based on fly behavior. In 2011, Telstar Eco Fence was tested under Newfoundland and Labrador (NL) conditions in collaboration with Agriculture and Agri-Food Canada (AAFC). The objectives were to test exclusion fencing on commercial farms in NL and assess whether the exclusion fences will deter flies. General information is required on assembly, maintenance and removal of fences. Preliminary results suggest cabbage maggot damage was lower inside the fences, thus indicating success. Additionally, fences did not compromise yield, though increased damage was noted on sides near wooded areas. Despite initial success further testing is required in order to recommend use of exclusion fencing in NL. Future studies will assess commercial scale use, fencing costs and damage that may be caused by moose and climatic conditions.

### Predator control in Newfoundland and Labrador

> *P. Dunphy, J. Roper*

Department of Natural Resources, St. John's, NL (pauldunphy@gov.nl.ca)

Predation on sheep has been identified as a major constraint to growth and development of the sheep industry in Newfoundland and Labrador (NL). In 2011 a Predator Control Project was undertaken by the NL Department of Natural Resources in partnership with the Sheep Producers Association of Newfoundland and Labrador to investigate the effectiveness of electric fencing to control predators. Electric fencing was installed at Long Harbour Pasture in 2011 and 2012, testing both 3 and 5 strand fencing. In the spring of 2012 video surveillance cameras were installed on the pasture to determine predator presence, predator type and timing of predator movements. The objectives of the project are to determine predator activity on regional pastures, to determine the efficacy of electric fencing at controlling predators, and to evaluate the fencing effectiveness based on predator activity. To date there has been no predator attacks on sheep herds following the installation of the fencing in the pastures, and there have been no observed predators.

### Sheep genetic enhancement in Newfoundland and Labrador flocks

> *P. Dunphy, J. Roper*

Department of Natural Resources, St. John's, NL (pauldunphy@gov.nl.ca)

Over the last decade there has been a dramatic decrease in the availability of quality breeding sheep in Newfoundland and Labrador (NL). Local purebred breeders and suppliers of quality stock have left the industry, thus forcing producers to purchase purebred animals out-of-province. Producer's reluctance to invest in unseen, out-of-province animals has resulted in a shortage of superior breeding stock. Ultimately, this has resulted in lower productivity, lower lambing returns and consequently, reduced profitability in the sector. The Sheep Genetic Enhancement project involves the introduction of quality purebred rams to 10 Newfoundland and Labrador sheep operations. Rams will be introduced in the fall of 2012.



## Poster Presentations

An evaluation will be conducted over the three year period following the ram introduction to determine the impact on flock productivity. Factors to be evaluated include: lambing percentage, weight at slaughter, weight of replacement ewes/rams, and a comparison to the unaltered flock under similar management. The expected outcome is that there will be improved efficiency and profits through increased lambing rates, improved growth rates and improved replacement ewes. The ultimate goal of the project is to increase availability of superior breeding stock to all Newfoundland and Labrador producers, through offspring that are genetically superior to the current provincial flock.

### Evaluation of integrated planting systems for growing sweet potato (*Ipomoea batatas*) in Newfoundland

> *R.A Blanchard*

Department of Natural Resources, Corner Brook, NL ([ruthanneblanchard@gov.nl.ca](mailto:ruthanneblanchard@gov.nl.ca))

In Canada, sweet potato is grown commercially in Ontario and Quebec, while smaller acreages have been grown in the Maritime Provinces in recent years. Sweet potatoes are an excellent source of vitamin A and a very good source of vitamin C, giving them healing properties as an antioxidant food. They are also very high in dietary fiber and complex carbohydrates, making them beneficial to diabetics who require stabilized blood sugar levels. While an increase in consumption has been observed in recent years, little work has been done in Newfoundland and Labrador (NL) on sweet potato production. They are considered an exotic vegetable in Canada and require high heat units to grow well. The use of plastic mulch; floating row covers; tunnel houses; and irrigation systems have allowed vegetable producers to diversify and tap into new markets by allowing them to capture the health-conscious consumer looking for a variety of fresh vegetables in their daily diet. Many of the non-traditional crops are considered "high-value crops", providing a good return on investment. Four on-farm trials were set up throughout Newfoundland to evaluate the effectiveness of raised beds, plastic mulch and irrigation in modifying the microclimate to grow sweet



potato. All sites were successful, yielding roots meeting US#1 and US#1 Petit standards; however only two of the four sites achieved any considerable marketable yield. While it is now known that sweet potato roots can be grown in temperate Newfoundland, further work is required to streamline a planting system and assist producers in increasing their marketable yields.

### Accelerated release potato program

#### > *R.A Blanchard*

Department of Natural Resources, Corner Brook, NL ([ruthanneblanchard@gov.nl.ca](mailto:ruthanneblanchard@gov.nl.ca))

The evaluation of new seed varieties not previously used in this province is important to the growth of both the seed potato sector and the continued commercialization of table potato production, as growers are continuously changing their varieties to meet the requirements of the retail grocery industry. The end of the federal potato breeding program in this province resulted in our dependence on new varieties mainly from the Maritime Provinces. Pest resistance must be coupled with favorable horticultural and quality characteristics if it is to sell in the retail market. The Accelerated Release Program is a two-phase process to fast track the release of promising potato selections developed at the Potato Research Centre of Agriculture and Agri-Food Canada (AAFC) in Fredericton, New Brunswick. Six selections plus a standard check were evaluated at four on-farm sites throughout the island as part of Phase 1 or the non-exclusive testing phase. In addition to these six AR selections, four promising selections from AAFC's potato breeding program were also evaluated at these sites. This season marked the first of three years of exclusive testing on AR2010-12; small plots were planted on nine farms, with the majority of the seed being planted at the Glenwood Seed Potato Farm. While all plots have been harvested, all selections have been placed in storage and will be graded by size. Marketable and unmarketable tubers will be counted and weighed and any defects/disease will be noted. Yield potential per acre will be determined for each selection and each site.



# Poster Presentations

## Assessing “Innovator” and tillage radish at Glenwood Seed Potato Farm

> *R.A Blanchard*

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The production of seed potatoes in Newfoundland and Labrador is a joint effort between the Provincial Department of Natural Resources, the Canadian Food Inspection Agency (CFIA), Agriculture and Agri-Food Canada’s Research Branch, and potato growers in an effort to manage potato pests within the Province. The Farm was initiated in 1973 in response to limited table stock supply from local farmers. The operation was to serve a dual purpose: supply growers with clean, disease-free seed stock while expanding the potato industry. The Farm is currently growing nine varieties and supplying seven seed producers throughout the province. Production is market responsive and the evaluation of new seed varieties not previously used in this province is crucial to the development and growth of both the seed potato sector and the continued commercialization of table potato production. The main objectives of this project were to evaluate the yield and quality of “Innovator” at Glenwood; and to assess the use of tillage radish as a cover crop following potato harvest and whether it can provide weed control in the spring and affect potato yields. “Innovator” is an early to mid-season russet potato variety that is characterized as being high yielding and uniform in grading. Approximately two acres of seed was planted this past growing season; yields are still to be determined as harvest is still ongoing. As the tillage radish is planted in the fall following potato harvest, results will not be available until the following season. It is expected that it will alleviate soil compaction and decrease weed numbers, leading to increased potato yields.



## Alternative crops initiative

### > *D. Simms*

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The Department of Natural Resources has been conducting research and developing commercially alternative crops such as cranberry over the past decade. As well innovative Research and Development has begun on new alternative crops such as hybrid blueberry and lingonberry with Newfoundland and Labrador genetics. Millions of cranberry plants have been propagated annually at the Wooddale Tree Nursery. These genetically pure “plugs” are used to supply the growing industry which is currently comprised of some 14 farms with over 200 acres of crop. Several hybrid blueberry and lingonberry cultivars, acquired from the Atlantic Cool Climate Research Center in St. John’s, will also be propagated at the nursery and evaluated during multiyear field trials beginning in 2013. Pilgrim has become the select variety of cranberry grown in the province due to its production history, however, WSU variety has shown good promise and further research on new varieties will continue. Research into alternative crops that have commercial viability for Newfoundland and Labrador is essential to the success and growth of the provinces agricultural industry.

## Botany and nutritional characteristics of bakeapple and partridgeberry

### > *L. Jiabai<sup>1</sup>, J. White<sup>2</sup>, K. Head<sup>2</sup>, D. Percival<sup>1</sup> and K. Pruski<sup>1</sup>*

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A two year study, 2011 – 2012 was undertaken to: 1) determine the phenology of Bakeapple and Partridgeberry including spring dormancy break, growth, blooming, fruit set, fruit ripening and harvest; 2) identify pollinators and timing of their occurrence in bogs of both species; and 3) identify bioactive compounds in fruits of both species including soluble solids content, titratable acidity, total phenolics and total anthocyanins. Three fields in Southern Labrador were selected for this study based on local recommendations. Three field locations are: Lanse’au Clair (N51°41',W57°08'), Red Bay (N51°43', W56°26'), Cartwright (N53°42', W57°0'). Pantrap data collected in at all three sites included insects belonging to *Hemiptera/Homoptera* (true bugs),





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*Coleoptera* (beetles), *Diptera* (flies) and *Hymenoptera* (bees, wasps, sawflies). The major pollinators observed were bees and flies. Identification of collected insects is still in progress. It is extremely important to keep, if possible, high populations of these insects. Based on phenology data collected it was possible to clearly outline growth stages of both species and the progress of fruit formation and ripening during the short Labrador's growing season. Since the data were collected on weekly basis, the observations can be useful in predicting the crop load during a particular growing season in future. Nutrient analyses, however unfinished (to be completed by December 2012), clearly show much higher polyphenol and anthocyanin content in partridgeberry than that of bakeapple. Also, the soluble solid content and titratable acidity were significantly higher in Partridgeberry. This can be attributed to natural characteristics of each of the fruit and to local people to choosing better fruits. The HPLC analysis of a number of biologically active compounds in collected berries is in progress.

### Identification of potential down stream impacts on surface water associated with cranberry development in Newfoundland and Labrador; and the adoption or development of beneficial management practices to mitigate any impacts

> **R. Carey<sup>1</sup>, B. Chen<sup>2</sup>, S. Zeigler<sup>2</sup>, A. Razek<sup>3</sup>, A. Zaher<sup>3</sup>**

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During the past five years cranberry field development has expanded from 33 acres in 2007 to over 200 acres in 2012. This exponential expansion has raised many concerns as to how this development is affecting the environment, particularly the potential contamination of surface water. The Department of Natural Resources and the Department of Environment were proactive in addressing this issue through a research project. This project entailed conducting water sampling on six cranberry farms for two field seasons, 2011-2012– three sites per farm. The three sites were >>>

strategically located; site one was water entering the cranberry field; site two was surface water on farm; and site three was surface water exiting the farm. Water samples were analyzed for: Nitrite, Nitrate, Carbonaceous Biological Oxygen Demand, Nitrogen (Ammonia Nitrogen), Orthophosphate, Organophosphorus Pesticides, and Organochlorinated Pesticides. Other data collected included: Water turbidity, electrical conductivity, total dissolved solids, pH and water temperature. Preliminary analysis on results from 2011 revealed only minimal detections indicating these levels do not have an environmental impact. 2012 sampling is continuing as of this date.

### Viability of cereal cultivation for animal feed production in Insular Newfoundland

> *V. Kavanagh<sup>1</sup>, K. Kennedy<sup>2</sup>, D. MacEachern<sup>2</sup>, T. Smith<sup>3</sup>, A. Fitzpatrick<sup>1</sup> and J. Roper<sup>3</sup>*

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Newfoundland and Labrador (NL) experiences unique agricultural challenges for cereal cultivation. Approximately 2% of the land is suitable for agricultural production, and growing seasons are short. There are no commercial cereal producers in NL and in 2011 ~47,000 tonnes of cereals were imported, making it one of the greatest farm expenses. The objective of the Alternative Feeds Program (AFP) is to identify cost-efficient and high-energy feeds suitable for NL livestock industries. The AFP is currently in the first year of a multi-year program to assess the viability of cereal cultivation (barley, oats, triticale and wheat) for animal feed production in insular Newfoundland using small plot and large on-farm trials on the East and West coasts. Small plot spring cereal varietal trials were conducted in Summer 2012. All varieties reached maturity with barley maturing first and oats and triticale last. Preliminary results indicate barley and oats may be more promising for spring planting. However, extreme drought conditions experienced during the growing season suggest results may not be typical. Winter cereal trials were initiated in September 2012 on 100 acres across 5 sites. Harvest will be completed in August 2013 and straw yield, grain yield and nutritional content will be assessed.







### Evaluating the effect of Salmon-based silage as an agricultural soil amendment on crop growth and soil nutrient dynamics in Newfoundland and Labrador

> *E. MacCormick*<sup>1</sup>, *G. W. Price*<sup>1</sup>, *A. Kwabiah*<sup>2</sup>, *R. P. Voroney*<sup>3</sup>, *W. Molloy*<sup>2</sup>

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<sup>3</sup>University of Guelph School of Environmental Sciences

The salmon farming industry in Newfoundland and Labrador (NL) has been steadily growing for the past twenty years, creating an increasing number of naturally occurring salmon mortalities that cannot be used for human consumption. The availability of salmon mortalities has the potential to provide a locally sourced soil amendment that could decrease the reliance on imported fertilizer used by the dairy industry in NL. A research project was initiated in 2010 to examine soil nutrient dynamics and crop production using a salmon-based liquid silage. Agricultural field studies have been conducted over two growing seasons with annual rye grass (*Lolium multiflorum*) and corn (*Zea mays*). Yield effects from increasing rates of the salmon silage are presented in this poster.

### Exploring the Origins of the 2012 Labrador Fox Rabies Outbreak

> *H. Whitney*<sup>1</sup>, *D. Marshall*<sup>2</sup>, *C. Fehlner-Gardiner*<sup>3</sup> and *S. Nadin-Davis*<sup>3</sup>

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<sup>2</sup>Department of Biology, Memorial University

<sup>3</sup>Centre of Expertise for Rabies, Ottawa Laboratory (Fallowfield), CFIA

Since January 2012, Labrador has experienced an outbreak of rabies in red foxes, with 16 cases detected in five communities (see map), with obvious concerns for public health. While many of these cases were detected as a result of enhanced wildlife rabies surveillance carried out by the NL Department of Natural Resources (Animal Health Division), two cases were identified by the CFIA after contact with domestic dogs. The infecting virus was typed by monoclonal antibody staining and in all cases



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shown to be the arctic fox rabies virus variant. Similarly, 23 cases rabies due to the arctic fox variant virus have been detected in northern Quebec since early 2011, with the majority of cases occurring since January 2012.

The proposed study will encompass nucleic acid sequencing of virus isolates and the prediction of relationships between them using established phylogenetic methods. Viral variant data will be mapped to illustrate the spread of the outbreak. In addition, arctic and red fox population structures will be examined using mitochondrial (mt) DNA control region (CR) sequencing and microsatellite (MSAT) mapping. Population structure will be compared with virus variant distribution with a view to better understanding the movement of the vector and virus across the landscape.

### Inter-Continental recombination in an H16N3 avian influenza virus from a Herring Gull (*Larus smithsonianus*) in Newfoundland

> Y. Huang<sup>1</sup>, M. Wille<sup>1</sup>, G. J. Robertson<sup>2</sup>, D. Ojkic<sup>3</sup>, H. Whitney<sup>4</sup>, A. S. Lang<sup>1</sup>

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Avian influenza virus (AIV) surveillance of wild bird populations is essential to improve our understanding of the role of wild birds in the ecology of low-pathogenic avian influenza (LPAI) and the potential contribution of wild birds to the spread of highly pathogenic avian influenza (HPAI). AIV sequences from around the globe fall into two major geographical lineages: Eurasian and American. However, many seabirds and gulls migrate long distances and/or have trans-oceanic distributions. These birds could move viruses between the continents and cause intercontinental gene recombination of AIV. We have been surveying the prevalence of AIV in different species of wild birds in Newfoundland for the past several years. This has shown that besides waterfowl, gulls are also important hosts for AIV in this region. In this study, the full genome of an AIV detected from a juvenile Herring Gull (*Larus smithsonianus*) at Gull Island in Witless Bay, A/Herring Gull/ Newfoundland/032/2010 (H16N3), was sequenced.

This is the second AIV characterized from gulls in Newfoundland and both viruses are inter-continental reassortants.

## The prevalence of snowshoe hare virus on the Avalon Peninsula of Newfoundland

> *K. Bassett<sup>1</sup>, T.W. Chapman<sup>1</sup>, A.S. Lang<sup>1</sup>, H. Whitney<sup>2</sup>, M. Drebot<sup>3</sup>*

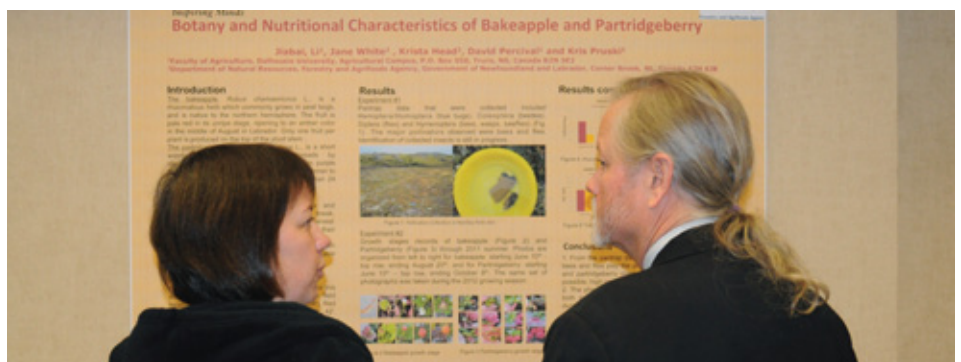
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Mosquito-borne viruses (arboviruses) have been of increasing concern in Canada, highlighted by the arrival of West Nile virus in 2001, two years after its arrival in New York City. As the extent of spread is directly influenced by weather, these diseases are of concern due to the warming global climate. Though humans are not the natural hosts for Canadian arboviruses, they can become infected and suffer significant illness and possibly death. Amongst domestic animals, horses are those that are most affected by these viruses.

One group in particular, the California serogroup of viruses (CSG) has received significant research focus. The viruses (snowshoe hare virus and Jamestown Canyon virus in particular) have been known to be active in this province for many years but no recent effort has been applied, until the last few years, to look at greater depth into the risks of arbovirus infections in this province. This study is looking at the temporal pattern of CSG virus activity in Newfoundland and the identity of the vector species that carry these viruses.





## Poster Presentations

### Impacts of agricultural drainage and climate change on greenhouse gas emissions in northern peatlands

> *J. Wu, Assistant Professor*

Boreal peatlands represent a globally important reservoir of soil carbon. They represent, by far, the largest carbon reservoir in Canada. They are small but persistent globally significant sinks for carbon dioxide and a moderate globally significant source of atmospheric methane. Boreal peatlands are contributing a cooling effect of global climate. Despite this, there is a global concern that they represent a potential source of greenhouse gas due to enhanced decomposition of soil organic matter resulting from human disturbances in the context of climate change. Significant human-made drainage has occurred on boreal peatlands for agricultural development. The demand to develop peatlands for agriculture has been continuously increasing in Newfoundland and throughout certain parts of the rest of Canada. This land-use pattern causes changes in vegetation communities and hydrological and biogeochemical processes in boreal peatlands. This project will examine the consequences of these shifts. Specifically, this research program is to examine how agricultural activities influence greenhouse gas exchange and carbon balance of boreal peatlands in context of climate change. This study will be conducted on a peatland complex, in western Newfoundland (NL), comprised of pasture, drained and natural peatlands within the same catchment. Eddy covariance and static chamber measurements will be used to examine the greenhouse gas exchange (i.e., carbon dioxide, methane and nitrous oxide) between peatlands and the atmosphere. Waterborne loss of carbon will be determined to obtain a complete carbon balance. This project will be the first to compare complete greenhouse gas fluxes and carbon balances from natural, drained, and pasture peatlands in Canada. Such knowledge is highly relevant to the Government of Canada and NL, both of which have embarked on strategic initiative to address climate change and related resource-based policies. It will be important for policy development in peatland management in Canada and beyond, and of immense interests worldwide. This study will benefit Canada by helping us create a mechanism for balancing the trade-offs between land-based greenhouse gas mitigation and other policy objectives.

## Sustainable Agro-Ecosystem Management Practices

> *G. Sabau, Associate Professor*

The future capacity to deliver agricultural outputs depends on the continuing viability of agro-ecosystems, yet significant stresses are imposed on them by intensification. The challenge is to foster agro-ecosystem management practices that will meet growing food, feed and fiber needs while providing more environmental protection. The poster will present management practices such as integrated pest management, integrated plant-nutrient systems, conservation tillage, organic farming and local agriculture (small farms, permaculture) which seek to meet the dual goals of increased productivity and reduced environmental impact.

## The Economics and Cost Production of Growing Sweet Potatoes in Newfoundland and Labrador

> *T. Brennan, Student*

This poster will present/describe the value of the sweet potato in nutrition as well as economics. It will also aim to describe past and present projects involving sweet potatoes as well as the economics and costs behind potential industrial farming of the sweet potato.

## The benefits of farmer's markets for consumers and producers

> *C. Edwards, Student*

This poster aims to present and discuss the potential benefits of local farmer's market for consumers and food producers from an economic, environmental, and social aspect. Some of the benefits which will be explored and presented in the poster are: 1) the concepts of farmer's markets creating a niche market; 2) the idea of eating local and having "good" food; and 3) supporting greater community integration.



## Poster Presentations

### Tir Tairngire Ecovillage: A Next Generation Farm

> R. Gosse, Student

This poster aims to present a research project that designed a sustainable ecovillage that can be developed/implemented in St. Fintan's, Newfoundland. The main features presented are: high density farming techniques like aquaponics, advanced greenhouse design, high-density vertical container farming, fish-feeding plants, and closed-circuit nutrient values to minimize waste in the system. Projections indicate that 500 persons could be fed on a single acre of intensive multi-stage farming, with 5 support acres.





# Symposium Participant List and Affiliation

## Our Food, Our Future

*Growing the Agriculture Industry in Newfoundland & Labrador.*

**November 23, 2012 / Greenwood Inn & Suites,  
Corner Brook, NL**

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