

# Our Food, Our Future.

*Growing the Agriculture Industry in Newfoundland & Labrador*

*Greenwood Inn & Suites*  
**November 23<sup>rd</sup>**  
Corner Brook, NL

*Innovative* Agricultural  
Research

Provincial Agricultural  
*Research Priorities*

*Fostering Partnerships*  
And Next Steps

# Our Food, Our Future

*Growing the Agriculture Industry in Newfoundland & Labrador.*

## Agenda

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

**9:00** | Welcome

**Dr. Gary Kachanoski**

President and Vice-Chancellor Memorial  
University of Newfoundland

**9:15** | Opening Presentations

**Glenn Janes**

CEO, 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/ Glenn Janes/ Dr. Christiane Deslauriers/  
Dave Jennings/ Eugene Legge

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

Antony Card, Associate Vice President (Research - Grenfell Campus)/ Dave Jennings,  
Director, Department of Natural Resources

*Thank you for making this Symposium a success!*



## Keynote Speaker

> **Dr. Richard Donald**

Associate Dean, Research  
Dalhousie University, Faculty of Agriculture

**An experienced researcher and educator in the fields of agronomy and the environment.**

Richard Donald has led a diverse career which has taken him across the globe. Born and raised in Montreal and the Quebec Eastern Townships, Richard first did a B.Sc. at Mount Allison University.



*Growing up in rural Quebec instilled in him a lifelong passion for agriculture and food and he went on to do a M.Sc. and Ph.D. in agriculture and soil science at the University of Guelph and the University of Saskatchewan. Since then Richard has worked as an agriculturalist across Canada and in over 23 countries around the world, including several years working as a CUSO volunteer in Central America, early in his career. Since then he has consulted in agriculture for the United Nations, the World Bank, CIDA, USAID, the international Finance Corporation and many other Canadian and international institutions.*

For the last three years, Richard has been the Vice-President of Research and Extension at Nova Scotia Agricultural College. As of September 1<sup>st</sup> he is the Associate Dean of Research at Dalhousie University's new Faculty of Agriculture where he works with researchers and educators as a catalyst to drive transition and innovation in the bio-resource and agri-food sectors in Atlantic Canada.

## Panel Member Profiles



> **Dr. Gary Kachanoski**

President & Vice-Chancellor  
Memorial University of Newfoundland

Dr. Gary Kachanoski became president and vice-chancellor of Memorial University of Newfoundland on July 1, 2010.

Dr. Kachanoski has been busy building the university's leadership team and focusing on developing a new strategic plan to guide the university's activities in teaching and learning, research, and public engagement, as well as overseeing the growth and development of the Marine Institute, Grenfell Campus in Corner Brook and the Labrador Institute.

Born in Manitoba and raised in Saskatchewan, Dr. Gary Kachanoski is a renowned soil scientist.

He has served as the President of the Canadian Society of Soil Science, Editor of the Canadian J. Soil Science, and is a Fellow of both the Canadian Society of Soil Science and Soil Science Society of America. He has also been inducted into the Canadian Conservation Hall of Fame for his work with rural communities and farm organizations.

Prior to coming to Memorial, Dr. Kachanoski as vice-president (research) at the University of Alberta led an increase in research revenue from \$250 million a year to \$490 million. Among other activities, Dr. Kachanoski also served as executive director of "Folkways Alive", a joint initiative of the University of Alberta and the Smithsonian Institute that provides leadership for the preservation of musical cultural heritage. Dr. Kachanoski is married with three children. His partner, Teresa, is an accomplished visual artist and arts administrator.



## Panel Member Profiles

### > **Glenn Janes**

Chief Executive Officer  
Research & Development Corporation

Glenn Janes is the Chief Executive Officer of the Research & Development Corporation. He is responsible for providing direction, focus and planning in order to strengthen and improve research and development throughout the Province.

*Glenn is a Rhodes Scholar. He holds a Master's degree in Environmental Change and Management and a Master's degree in Business Administration, both from Oxford University. He completed a Bachelor of Science in chemistry at Yale University*



Most recently Glenn was with Imperial Innovations Group plc in London, England, the UK's leading technology commercialization company. At Imperial Innovations, Glenn was responsible for the development and management of the United Kingdom's first Recycling/Waste Minimization Technology Commercialization Centre.

Glenn has held a range of progressively senior positions with companies involved in research, development and technology commercialization processes, including Platina Finance, a London-and Paris-based private equity fund manager. In Newfoundland and Labrador, he has worked with Mad Rock, a developer of safety emergency evacuation sea systems, Hi-Point Industries, Consilient Technologies and Genesis Organic Inc.

## Panel Member Profiles



> **Sandy Todd, PAg**

Research Manager  
Agriculture and Agri-Food Canada

Sandy Todd is the Director of Operations at the Agriculture and Agri-Food Canada research centre in St. John's. The centre is known as the Atlantic Cool Climate Crop Research Centre and is one of Agriculture and Agri-Food Canada's national network of 19 research centres. ACCCRC leads development of agriculture technology supporting the growth of primary production in the boreal ecozone, with a special emphasis on Newfoundland and Labrador.

Scientists at the centre undertake research in 2 domains consistent with the mission of the centre: Primary Production Agriculture support for horticultural crops (especially berries suitable for production in the boreal ecosystem) and agronomic research in forage and cereal crops in support of the regional dairy value chain; and Environmental Stewardship for improved performance of the agricultural production system in the fragile boreal environment. The centre has strong linkages with the Agrifoods Development Branch of DNR, MUN and industry associations.

Prior to becoming director Sandy led research programs in the areas forages and cereals management, and best management practice for the use of liquid dairy manure in a timothy (grass) production system. Other areas of research experience include no-till reseeding of old forage fields on the Avalon Peninsula and the yield and winter hardiness of high sugar perennial ryegrass varieties bred in Wales.

Sandy is a member of the Newfoundland and Labrador Institute of Agrologists, and a past president of the Agricultural Institute of Canada.





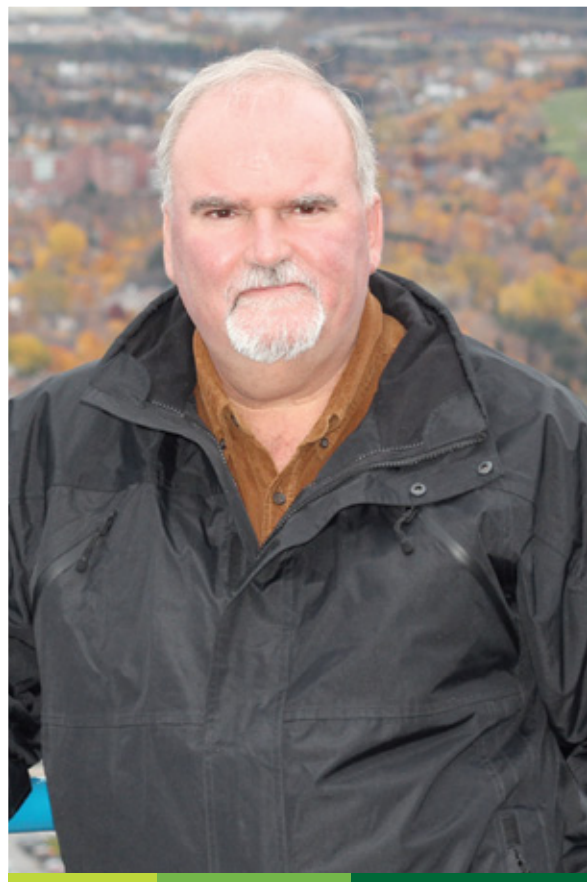
## Panel Member Profiles

### > *Dave Jennings, PAg*

Director, Production & Market Development Division,  
Department of Natural Resources

*Dave Jennings has worked in the Newfoundland and Labrador Agricultural industry as a part time farmer and employee of Agriculture and Agri-Food Canada, the Canadian Food Inspection Agency and the provincial Department of Natural Resources.*

Dave is currently the Director of the Production and Market Development Division of the Agrifoods Branch. In this capacity, Dave is responsible for the Research and Development Program of the Agrifoods Branch and is the Chair of the Agricultural Research Initiative Implementation Committee. Dave graduated from Memorial University with a B.Sc. in Biology with a concentration in Parasitology and from McGill University with a Master of Science in Plant Pathology.



## Panel Member Profiles



### > *Eugene Legge*

President

Newfoundland and Labrador Federation of Agriculture

Eugene Legge is a chicken farmer based in Harbour Main who has been involved in the agriculture industry since 1966. At that time he worked as a summer student with Newfoundland and Labrador Farm Products. Upon graduating from high school in 1969, he began working full time with his father. He continued on that path until he established his own farm in 1973.

In 1985 after purchasing his second quota, he established ChrisDarMar Farms. He now shares the operation with his son Darryl. It produces over 800,000 birds a year.

In addition to having run a successful business, Eugene has always participated in organizations to enhance the future of agriculture. This includes President and Past President of the Newfoundland and Labrador Federation of Agriculture, Vice Chair of the Newfoundland and Labrador Chicken Marketing Board, Chair of the Agri-Adapt Council, as well as Director and Alternate for Chicken Farmers of Canada. He has also served on many committees at the national level.

Eugene has also volunteered his time and experience to mentor the future leaders in agriculture with the Young Farmers organization and has contributed to trade negotiations, agricultural research, diversification, technology enhancement, food safety, animal welfare, education and promotion of agriculture.

He has also promoted bio-security, soil and water conservation, supply management, land issues and disease management. In summary, Eugene has provided leadership in government relations, liaison among farmers and commodity organizations and





## Panel Member Profiles

always advanced agriculture. Despite his busy schedule, Eugene has always had time for involvement in his community. He has served for over 32 years with the Sea Cadets as CEO, Supply Officer and Training Officer and he still plays an active role with this group.

*Eugene is a member of the Royal Canadian Legion Branch 64 and has served in several positions such as treasurer, secretary and vice president. He has also been a member of the Harbour Main Town Council.*



## Speaker Profiles & Presentation Abstracts



> ***Dr. Vanessa Kavanagh. PhD, PAg***

Cereal Grain Specialist

Production & Market Development Division,  
Department of Natural Resources

Vanessa Kavanagh is originally from Corner Brook and received her Bachelor of Science with an advanced double major in biology and history from Dalhousie University in Halifax, Nova Scotia in 2003. In 2007, she completed her MSc at Saint Mary's University in Halifax, Nova Scotia and assisted in the development of the first soybean inoculants specifically for western Canadian soils. She obtained her PhD in 2012 from the University of Alberta where she assessed the environmental biosafety of transgenic triticale - concentrating on pollen mediated gene flow. She joined the Department

of Natural Resources – Agrifoods development branch in April 2012 and is currently the Alternative Feeds Coordinator and Cereal Specialist for the department.

### **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,





## Speaker Profiles & Presentation Abstracts

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.

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

Research Scientist

Agriculture and Agri-Food Canada

Dr. Samir C. Debnath, PAg is a Research Scientist at the Atlantic Cool Climate Crop Research Centre of Agriculture and Agri-Food Canada (AAFC) in St. John's, NL and an Adjunct Professor of Biology at the Memorial University of Newfoundland.

The former professor of Bangladesh Agricultural University had been trained and worked in India on maize breeding (1978-82), Germany on potato biotechnology (1984-86) and in UK on lettuce biotechnology (1993-94) before he joined AAFC St. John's Research Centre, in May, 1996. Dr. Debnath also worked at the AAFC Kentville Research Centre in Kentville, Nova Scotia for two years from November, 1996 to November, 1998. He has authored and co-authored more than 100 publications in peer-reviewed journals including review papers and book chapters, in plant propagation, biotechnology and breeding. He has been a keynote speaker and an invited speaker at a number of >>>



# Speaker Profiles & Presentation Abstracts

> *Dr. Samir C. Debnath, PhD, PAg Continued from page 10...*

national and international conferences and meetings, is an active member of some national and international professional associations, was the President of the Newfoundland and Labrador Institute of Agrologists (P.Ag.) and is the President of the Canadian Society for Horticultural Science. His research concerns biotechnology-based value-added small fruit and medicinal plant improvement. Much of his current work focuses on biodiversity, propagation, wild germplasm improvement and breeding of berry crops including blueberry, cranberry, lingonberry, strawberry, raspberry and cloudberry, and medicinal plants (roseroot) using in vitro (bioreactor micropropagation, in vitro selection) and molecular techniques (clonal fidelity, genetic diversity, marker-assisted selection) combined with conventional methods.

## 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



# Speaker Profiles & Presentation Abstracts

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**

Chief Veterinary Officer

Animal Health Division, Department of Natural Resources

Dr. Whitney has graduated from McGill University (BSc Agriculture), l'Université de Montréal (Doctor of Veterinary Medicine), the University of Saskatchewan (MSc, veterinary microbiology) and most recently Memorial University (MA - History). Since 1985 he has worked as Chief Veterinary Officer with the provincial government which includes the direction of a farm animal veterinary service, an ISO 17025 certified diagnostic and food safety laboratory, animal disease surveillance and control, food safety regulation of milk and meat, and programs for animal welfare. He has been an adjunct professor with Memorial University since 1999.



## **Presentation Title**

Animal Disease Research in Newfoundland and Labrador.





# Speaker Profiles & Presentation Abstracts

> *Dr. Hugh Whitney Continued from page 12...*

## 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.



### 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 >>>

# Poster Presentations

> *Continued from page 14...*

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>**

<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

<sup>3</sup>Agriculture and Agri-Food Canada, Kentville, NS

<sup>4</sup>Agriculture and Agri-Food Canada, Bouctouche, NB

<sup>5</sup>Department of Agriculture, Charlottetown, PEI

<sup>6</sup>Arapoint, 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.

# Poster Presentations

## 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.



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)

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 >>>



# Poster Presentations

> *Continued from page 18...*

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.



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

➤ *R.A Blanchard*

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

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.



# Poster Presentations

## Alternative crops initiative

> *D. Simms*

Department of Natural Resources, Bishop Falls, NL (deannesimms@gov.nl.ca)

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>*

<sup>1</sup>Dalhousie University, Agricultural Campus, Truro, NS (kpruski@dal.ca)

<sup>2</sup>Department of Natural Resources, Corner Brook, NL

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),

*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

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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 >>>



## Poster Presentations

> *Continued from page 22...*

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.

### New tools evaluated for cranberry production. Web-based monitoring tools help cranberry growers optimize production and reduce costs

> *S. Anderson, P. Murphy*

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Successful cranberry production requires large amounts of water, and effective management strategies can help growers maximize yield and quality while reducing water usage and energy costs. A three-year project was launched in 2010 by Agriculture and Agri-Food Canada to work with cranberry producers across Atlantic Canada to determine optimum soil moisture conditions for cranberry production. The project evaluates three web-based soil moisture monitoring stations in Newfoundland and Labrador and New Brunswick that looks at new technology to help growers with monitoring soil moisture conditions, irrigation management, and frost protection.

With this new technology, the intent is to demonstrate and evaluate potential water and energy savings that could be generated through a web-based irrigation management system. The goal of the project is to gain confidence in the system and to find out what works best for individual growers, and the climate for their particular region and individual fields.

This poster will demonstrate, evaluate, and facilitate the adoption of various types of in field soil and water measurement equipment, specific to the unique characteristics pertaining to cranberry production on peat based cranberry bogs.



## Poster Presentations

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

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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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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



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. >>>

# Poster Presentations

> *Continued from page 26...*

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.



## 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.



## Poster Presentations

### 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.

## 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.

*The 2012 Agriculture Research Symposium Planning Committee would like to sincerely thank all of our partners, speakers, panel members, poster presentation participants and student volunteers.*

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