EXECUTIVE SUMMARY

Canadian Agricultural Innovation and Regulation Network (CAIRN) is one of the five research networks funded by Agri-Food Canada through Enabling Research for Competitive Agriculture (ERCA) program. There are thirty-five CAIRN members representing different academic, government and private institutions not only from Canada but also from other countries as well.

The objective of the CAIRN is to bring researchers together to study the processes of agricultural innovation while proactively engaging government, industry, and the public in an effort to improve the agricultural innovation system in Canada. More specifically, however, CAIRN will identify and resolve obstacles to innovation, build a body of knowledge, train graduate students, and increase the understanding of the agricultural innovation system in the context of its regulatory environment. It will build on its previous accomplishments and utilize its capacities in further advancing effective and sustainable innovation policy.

2011/2012 was a productive year for CAIRN. The network supported eleven graduate student research projects that initiated or continued in 2011/2012. Furthermore, the CAIRN network hosted a successful Workshop in December 2011 and organized the session one of the CAES-ERCA Policy Conference in January 2012. In addition, as evidenced in this report, members of CAIRN have contributed to agricultural innovation and regulation sectors in number of ways. They have engaged in number of innovation related research projects, have made number of publications, presentations and also have participated in policymaking process during this year.

This report is organized into five sections. Section 1 contains CAIRN’s objectives and its’ research matrix. Section 2 is describes graduate student research projects with some CAIRN funding that were initiated or continued in 2011/2012. Section 3 contains a partial list of members’ research activities, publications and presentation during 2011/2012. Section 4 gives the list of new CAIRN reports and policy briefs completed in 2011/2012 and section 5 briefly summarizes the CAIRN Workshop and the CAIRN’s contribution in CAES-ERCA Policy Conference.
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1: INTRODUCTION

The Canadian Agricultural Innovation Network (CAIRN) was established in December 2004 by Agriculture and Agri-Food Canada (AAFC) as one of five Agricultural Policy Research Networks. Funding was renewed by AAFC under the Enabling Research in Competitive Agriculture (ERCA) program for the period October 1, 2009 to March 31, 2013. CAIRN altered its name to Canadian Agricultural Innovation and Regulation Network. This report covers the period April 1, 2011 to March 31, 2012.

1.1 Background and CAIRN Objectives

A number of economic, demographic, and environmental forces are converging that will fundamentally change the face of agriculture over the next few decades. As a result of forces like the concern over greenhouse gas emissions, food safety, and energy security, society will increasingly be looking to agriculture for solutions. Agriculture is well positioned to contribute to environmental sustainability, the provision of bio-energy and bio-products, and other goals. In providing these solutions, agriculture must be economically sustainable in an increasingly competitive global market place. Innovation is vital to effectively respond to these challenges.

Despite the recognition of the importance of innovation, developing the best innovation regulations and policies for facilitating adoption and market growth remains a challenge. Agricultural innovation is often constrained by a lack of public and private research funding, cumbersome regulation, jurisdictional disputes, freedom to operate, trade constraints, inappropriate commercialization vehicles and other aspects of the innovation system. Policy work is needed to deal with these issues.

CAIRN’s objective is to bring researchers together to study the processes of agricultural innovation while proactively engaging government, industry and the public in an effort to improve the agricultural innovation system in Canada. More specifically, however, CAIRN will identify and resolve obstacles to innovation, build a body of knowledge, train graduate students and increase the understanding of the agricultural innovation system in the context of its regulatory environment. CAIRN II will build on its previous accomplishments (CAIRN I 2005-2009) and utilize its capacities in further advancing effective and sustainable innovation policy.
1.2 Description of Network Research Program Areas

The Innovation and Regulation Network defines its research areas as a matrix. There are three main areas of agricultural innovation; primary agriculture, functional food and food processing, and bio-energy/bio-product - and four areas of policy analysis; innovation, regulation, coordination and commercialization, and impact measurement.

Table 1.0 CAIRN Research Matrix

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The matrix represents the interdependency of the agri-food sector and the need for multi-faceted public policy, which supports the innovation process, including the commercialization process.
1.3 CAIRN Membership (2011-2012)

CAIRN is composed of thirty-five members representing academic, government and private institutions from British Columbia to Nova Scotia as well as the United States and Europe.

1. Julian Alston University of California-Davis
2. Henry An University of Alberta
3. Derek Brewin* University of Manitoba
4. Metin Cakir University of Saskatchewan
5. Ryan Cardwell University of Manitoba
6. Richard Carew AAFC - Summerland
7. Stephen Clark Nova Scotia Agricultural College
8. John Cranfield University of Guelph
9. Shon Ferguson Research Institute of Industrial Economics
10. Murray Fulton* University of Saskatchewan
11. Hartley Furtan (on leave) University of Saskatchewan
12. Viktoriya Galushko University of Regina
13. Pascal Ghazalian University of Lethbridge
14. Greg Graff Colorado State University
15. Richard Gray* University of Saskatchewan
16. Jill Hobbs University of Saskatchewan
17. Wilf Keller Genome Prairie
18. Bill Kerr University of Saskatchewan
19. Kurt Klein University of Lethbridge
20. Bon Koo University of Waterloo
21. Andréanne Léger AAFC-Ottawa
22. Stavroula Malla* University of Lethbridge
23. Anwar Naseem University of McGill
24. Rose Olfert University of Saskatchewan
25. Peter Phillips University of Saskatchewan
26. Cami Ryan University of Saskatchewan
27. Grace Skogstad University of Toronto
28. Stuart Smyth University of Saskatchewan
29. David Sparling* Ivey School of Business
30. Bodo Steiner University College Cork
31. Shelley Thompson* SJT Solutions
32. Kien Tran University of Lethbridge
33. James Vercammen* University of British Columbia
34. Crina Viju Carlton University
35. Simon Weseen IBRG

* Denotes CAIRN Executive Member
2: CAIRN FUNDED GRADUATE STUDENT RESEARCH PROJECTS IN 2011/2012

During 2011/2012 CAIRN funded 12 projects that involved graduate student research. These projects are all co-funded in-kind through supervisory roles, and other University support. Most of these projects also receive a significant amount of additional financial support through fellowships and scholarships, and project funding. A list of graduate projects that were funded by CAIRN during 2011/2012 is found below. These projects are briefly described in the remainder of the section in the same order.

2.1. Firm R&D Investment in Plant Breeding With and Without Farmer-Saved Seed Levies and Complementarities Between Seed Products and the Breeding Process (Arzandeh and Brewin)

2.2. A Benefit/Costs Analysis of CWRS Wheat Variety Performance Trials in Western Canada (Covey and Gray)

2.3. Exploring the Cultural Dimensions of how Networks Emerge to Bring Products to Market: The Case of the Ontario Goat Industry (Leithwood, Branzei and Sparling)

2.4. The Regulation of Renewable Fuels (Mondou and Skogstad)

2.5. The Dynamics of Hybrid Seed Pricing: Lessons from the Canola Industry (Torshizi and Gray)

2.6. Exploring the Adoption of Traceability and Food Quality Verification Technologies (Ugochukwu and Hobbs)

2.7. Economics of Innovation: The Adoption of Conservation Tillage Technology (Awada and Fulton)

2.8. Role of Public-Private Partnership (P3s) in Plant Genetic Resource Research and Development (Boland and Phillips)

2.9. The End Point Royalties in the Australian wheat innovation system (Bolek, Alston and Gray)

2.10. Co-regulation: Exploring the Interface Between Regulation and Private Standards (Lassoued and Hobbs)

2.11. R&D Decisions by Producer Groups (Zhihua and Fulton)

2.12. Time Inconsistent Commercialization Competitions (Zubchenko and Vercammen)
2.1: Firm R&D Investment in Plant Breeding With and Without Farmer-Saved Seed Levies and Complementarities Between Seed Products and the Breeding Process

School: University of Manitoba  
Project Leader: Derek Brewin  
Graduate Student: Mehdi Arzandeh, PhD student

Proposed Timelines and Progress To Date: Draft Report has been submitted by Arzandeh and accepted for presentation at the 128th EAAE Seminar And 16th ICABR Conference: “The Political Economy of The Bio-Economy: Biotechnology And Biofuel”, Ravello, Italy, June 24-27, 2012.

Abstract:  
This study examines the dynamics of incentives for R&D firms to invest on improvement in the biotechnology varieties, which are sold to differentiated farmers by competing with an existing generic seed in an oligopolistic market. We distinguish between the two types of innovation, in process and in product, and assume they positively affect the outcome of one another R&D investment. A number of propositions were drawn for empirical analysis and policy purposes.

2.2 A Benefit/Costs Analysis of CWRS Wheat Variety Performance Trials in Western Canada

School: University of Saskatchewan  
Project Leader: Richard Gray  
Graduate Student: Caalen Covey, MSc student

Proposed Timelines and Progress To Date: The first draft of this thesis has been completed and the anticipated completion of the research project is July, 2012

Abstract: Despite the current support for the variety testing system, governments often face pressure to reduce funding for variety performance trials, and some parts of the seed industry are sometimes reluctant to participate in these trials. A Benefit /Cost analysis will serve to quantify the economic impact of this public/investment to better inform the process of resource allocation. More than 30 years of variety testing and adoption data is used to econometrically estimate role of information in the adoption process. The estimated parameters from the model will be used to simulate adoption with and without variety testing. Using a partial equilibrium framework these simulations will be used for a Benefit/Cost analysis.
2.3. Exploring the Cultural Dimensions of how Networks Emerge to Bring Products to Market: The Case of the Ontario Goat Industry

School: University of Western Ontario
Project Leader: Dr. David Sparling & Dr. Oana Branzei
Graduate Student: Melissa Leithwood, PhD student

Proposed Timelines and Progress to Date: To date the exploratory phase has been completed and phase 1 of this 2-year study has been partially completed as proposed; Data collection, Netnographic observation, Literature Review, Conference Presentation, Partial Conceptual Framework. March 31, 2013 is the proposed completion date of the research.

Abstract:
Facebook, Twitter, and blogs, these are some of the online social media networks many people visit on a weekly basis in order to keep updated and in touch with friends, share information, and chat with others about experiences and product reviews. What we know very little about is the differing roles an individual takes on as expressions of their virtual identity in online social media networks and how these roles evolve in virtual conversation. This study is part of a two-phase research agenda that looks at the role of networks in bringing new products to market. Specifically, the first phase of this research agenda examines how roles, as expressions of virtual identity, evolve progressively through virtual conversation and construct taste in the context of an online social media network dedicated to goat meat, milk, and cheese consumption. This research provides important insight into the role of online consumer networks in market emergence.

2.4: The Regulation of Renewable Fuels

School: University of Toronto
Project Leader: Grace Skogstad
Graduate Student: Matthieu Mondou, PhD student

Proposed Timelines and Progress to Date: Full draft of report submitted on 30 April, 2012

Abstract: The Regulation of Biofuels in the United States, European Union and Canada

The implementation of mandatory blending targets and environmental sustainability standards for renewable fuels in the United States and the European Union (EU) directly affects Canadian producers of renewable fuels and renewable fuel feedstocks. The blending targets open up new market opportunities, but seizing these opportunities requires compliance with the environmental sustainability requirements of the respective US and EU legislation. Moreover, the American and EU renewable fuel mandates and environmental sustainability criteria are both subject to continuing controversy. A major
source of contention is the appropriate model to estimate renewable fuels’ greenhouse gas emissions over their lifecycle, including whether and how to estimate indirect land use changes of biofuels. Even while these domestic controversies remain unresolved, there are initiatives underway in the global arena to develop common methodologies and sustainable practices for biofuels. As a party to the latter, Canadian government and industry officials have an opportunity to create a level cross-jurisdictional playing field for producers of renewable fuels and feedstocks. Bringing Canadian public policies for renewable fuels into closer alignment with those in the US and EU would also serve to promote the Canadian renewable fuel industry.

2.5: The Dynamics of Hybrid Seed Pricing: Lessons from the Canola Industry

School: University of Saskatchewan
Project Leader: Richard Gray
Graduate Student: Mohammad Torshizi, PhD student

Proposed Timelines and Progress to Date: This thesis follows the three-essay mode and for all the three essays; Introduction, Literature Review, Conceptual Framework and Empirical Approach have been completed. December 2014 is the proposed completion date of the research.

Abstract:
The result of the accumulation of knowledge and capital by the seed producers, which are also protected by strong IPRs, has been an acceleration of yield improvements with farmers paying increasing prices for new varieties of seed. This dissertation explores the pricing strategies employed by firms in an industry characterized by sequential and cumulative innovation and strong IPRs. This will provide important insight into the evolution of such industries over time.

2.6: Exploring the Adoption of Traceability and Food Quality Verification Technologies in Canada

School: University of Saskatchewan
Project Leader: Jill Hobbs
Graduate Student: Albert Ugochukwu, PhD student

Proposed Timelines and Progress to Date:
The thesis is comprised of three essays. A research proposal comprising an introduction, literature review and theoretical foundations the three essays has been completed. The proposed completion date for the research is August 2014.
Abstract:
With increasing interest from consumers in where their food comes from and how it was produced, credible quality signals for credence attributes become ever more important. While proxy signals of quality can be useful in reducing search costs they create incentives for deliberate misrepresentation of products, such as substituting inferior ingredients, counterfeiting, and mislabelling the species or origin of products. Sub-standard products create reputation externalities for other food firms. Emerging authenticity technologies have the potential to verify quality claims. This study examines incentives for firms to adopt authenticity technologies, the implications for collective industry reputations, and the potential role for authenticity and quality verification technologies in international regulatory frameworks.

2.7: Economics of Innovation: The Adoption of Conservation Tillage Technology

School: University of Saskatchewan
Project Leader: Murray Fulton
Graduate Student: Lana Awada, PhD student

Proposed Timelines and Progress to Date: Lana is completing the final draft of her thesis. She should defend her thesis by the end of June 2012.

Abstract:
This research examines the adoption of conservation tillage technology in the Canadian Prairies, to understand how economic and other factors affect farmers’ decision to adopt this technology. Specifically, this research focuses on the following three objectives. The first objective is to survey the historical factors – economic, environmental, social, and political factors – behind the development and adoption of conservation tillage technology on the Prairies during the 1930s and 1990s. The second objective is to determine the welfare implications of the switch from traditional tillage (TT) to zero-tillage (ZT) technology on different agricultural input suppliers in the spring wheat industry. The third objective is to empirically examine the impacts of neighbourhood and farmer characteristics factors on the adoption of zero tillage technology on the Prairies over time.
2.8: Role of Public-Private Partnership (P3s) in Plant Genetic Resource Research and Development

School: University of Saskatchewan
Project Leader: Peter Phillips
Graduate Student: Bill Boland, PhD student

Proposed Timelines and Progress to Date: My PhD consists of three comprehensive examinations and three articles on P3s. To date, two articles and two comprehensives are completed. I anticipate completion of the last article and comprehensive by June of 2012 and, at that time, will submit all three articles to my committee to fulfill the requirements of my program. Pending revisions and approval I should be prepared to defend my PhD in the fall of 2012.

In the 2011/12 academic year, my research was presented at four separate conferences: The Triple Helix IX in Stanford CA, The GMCC-II in Vancouver BC, the CAIRNS AGM in Banff AB, and at the VALGEN AGM in Vancouver BC. Additionally, I was contracted to do a commissioned research paper for P3 Conference hosted the International Development Research Centre (IDRC) and the Syngenta Foundation for Sustainable Agriculture and I am preparing a paper for the upcoming Triple Helix X Conference in August.


2.9: The End Point Royalties in the Australian wheat innovation system

School: University of Saskatchewan
Project Leader: Richard Gray and Julian Alston
Graduate Student: Katarzyna Bolek, PhD student

Abstract:
Agricultural innovation continues to be one of the greatest achievements of mankind. Productivity of the agriculture has increased as a result of countless innovations. Future demand driven by increasing population, income growth and climate change; creates the imperative for an effective global crop innovation system. The available empirical evidence suggests that the returns to agricultural R&D though variable, are high on average. That implies persistent underinvestment in agricultural research. Australian model for funding wheat breeding is innovative, complex and is characterized by higher intensity than exist internationally. That makes it attractive for studies. Goal of this thesis is to analyze Australian system for delivering agricultural research with all its aspects, incentives and impacts on welfare. This thesis consist of 3 essays:

Essay 1 discuss Australian system for plant breeding and commercialization of new wheat varieties (over the last 30 years) in the framework of theory of the firm. This exercise includes a review of the system, introduction of Plant Breeders Rights, introduction of End Point Royalties and its importance for R&D funding and also the Grain Research and Development Corporation (the GRDC) with its role in Australian system of funding plant breeding, and GRDC’s partnerships in the industry. Vertical integration in breeding programs is analyzed in the framework of Gibbons 2005 and is compared to counterfactual scenarios.

Essay 2 provides the theoretical static model to determine the demand for the wheat varieties and eventually pricing behavior of breeding companies with different ownership structure. Three ownership structures include private company, which would have objective function of profit maximizing. Private-public company is going to set price equal to average cost, while public company’s objective function is to maximize social surplus.
In Essay 3 the empirical studies are conducted to analyze adoption of wheat varieties in western Australia. Data used in those studies are collected from the state of Western Australia and cover 25 years of adoption rates for wheat varieties, the EPRs rates for wheat varieties and several qualitative characteristics of those varieties. Furthermore, the French system for plant breeding is discussed and simulation of welfare impact of uniform EPR system is done in order to compare it to Australian results.

2.10: Co-regulation: Exploring the Interface Between Regulation and Private Standards

School: University of Saskatchewan
Project Leader: Jill Hobbs
Graduate Student: Rim Lassoued, PhD student

Proposed Timelines and Progress to Date:
The literature review and analysis are complete and a draft final report has been prepared. Dissemination activities have included a poster paper (January 2011) and a paper presentation at the December 2011 CAIRN workshop. Final editing on the draft report is underway with expected completion by July 2012.

Abstract:
The project examines the notion of ‘co-regulation’, whereby public sector regulation is combined with private standards through a mixture of primary legislation as the governing framework reinforced by a more flexible self-regulatory approach. The interaction between regulation and innovation is examined. Lessons are drawn from co-regulatory experiences in various countries in both food (food safety) and non-food (transportation, media, environment) contexts.

2.11: R&D Decisions by Producer Groups

School: University of Saskatchewan
Project Leader: Murray Fulton
Graduate Student: Xiao Zhihua, PhD student

Proposed Timelines and Progress to Date:
Xiao Zhihua has defended her proposal and is now working on the first part of her analysis. She has at least one more year to go before she is finished.
Abstract:
The purpose of this thesis is to examine the factors that cause farmers to under invest in agricultural research. There are two aspects to this analysis. The first aspect examines whether the horizon problem – the fact that a farmer’s benefit horizon is less than the length over which agricultural R&D will have an impact – can provide an explanation for the chronic underinvestment that has occurred. The second part of the analysis examines whether farmers view the benefits and costs associated with R&D in the manner prescribed by standard economic theory, or whether psychological factors – such as the tendency to segment expenses into mental accounts or the tendency to use hyperbolic discounting rather than exponential discounting – can provide an explanation for the underfunding of agricultural R&D.

2.12: Time Inconsistent Commercialization Competitions

School: University of British Columbia, Faculty of Land and Food Systems
Project Leader: James Vercammen
Graduate Student: Anna Zubchenko, M.Sc. student

Proposed Timelines and Progress: Thesis defense is scheduled on April 16th, 2012

Abstract:
Business innovation is a powerful source of productivity increase and economic growth. Lack of financing at commercialization stages of innovation development often dooms socially valuable innovations to failure. To address pre-commercialization market failure, public agencies assist entrepreneurs with financial resources through commercialization competition mechanisms. Public agencies administering commercialization competitions may have dual objectives. Ex ante, they aim to induce entrepreneurs to invest an efficient amount of resources, accounting for resource costs and the associated expected social benefits. Ex post, commercialization awards should be allocated so that the expected social welfare aggregated across all projects is maximized. This would likely entail maximizing the number of socially valuable projects which are successfully commercialized.

The objective of this thesis is to demonstrate that the ex ante and ex post objectives of a public agency may be in conflict. The ex ante award allocation criteria announced when the competition is launched may differ from the ex post award criteria retained by the agency as private information. Thus, agency decision-making may be time inconsistent. To achieve this objective, first, a theoretical model of commercialization competition was developed based on a real-world prototype, New Ventures Competition, administered by the British Columbia Innovation Council. It demonstrates that the competition causes underinvestment on the entrepreneurs’ side and allows the agency to deviate from ex ante announced award allocation criteria.
Second, since time inconsistency is related to competition fairness, an experiment was conducted to determine whether respondents trade the competition fairness for “greater social good”. It was established that when respondents are aware of both entrepreneurs’ financial contributions to projects and their financial need, and when they are put into situation where maximization of social welfare is in conflict with maintaining ethical values, respondents tend to deviate from an allocation decision based on *ex ante* announced criteria.

Third, it was established that when respondents face a particularly strong ethical trade-off, the higher the grades they received on average in their last year at school, the less they tend to change their original rankings to assist in the commercialization of comparatively lower quality projects at the expense of competition fairness.
This section has compiled a partial listing of members’ research projects, publications and presentations, and future research plans that some members have chosen to share.

Julian Alston

1. Innovation related publications


1. Innovation related research projects

“Measuring consumer resistance to innovation in meat packaging – evidence from choice experiments” (with Qing Chen and Sven Anders). Funded by: CMD network. Progress: manuscript is in preparation.

“Poplars for biofuels” (GELS component of a genome Canada project, with 6 other contributors). Funded by: Genome Canada. Progress: initial stages of research.

“Whole genome selection through genome-wide imputation in beef cattle” (GELS component of a genome Canada project, with 6 other contributors). Funded by: Genome Canada. Progress: initial stages of research.

“Application of genomics to improving swine health and welfare” (GELS component of a genome Canada project, with 6 other contributors). Funded by: Genome Canada. Progress: initial stages of research.


2. Innovation related publications

“A discrete-time duration analysis of technology disadoption: the case of rbST in California” (with L.J. Butler) – accepted for publication by the Canadian Journal of Agricultural Economics.

“The disadoption of rbST and its economic impact: a switching regression approach” (under review)
Derek Brewin

1. Innovation Related Research Projects

Project 1: Phosphorus budgets and literature review of fertilizer markets for manure co-products
Funding sources: Manitoba Livestock Manure Management Initiative
Timeline and progress to date: Phosphorus Balances Calculated through Winter of 2011/12, Draft Final of Final Report in hands of MLMMI

Abstract:
This report reviews the literature related to phosphorus (P) based manure management relevant to Manitoba’s land use and animal inventories. Most of Manitoba is still in a P deficit situation and could carry many more animals without significant cost in manure management. Regulations have evolved to address nutrient cycles as the science progresses. Science has also suggested new management strategies for feeding animals, and treating and applying their manure.

Significant reductions have occurred in cattle and hog populations in Manitoba in the last five years. Even accounting for these animal population shifts, there are a handful of Rural Municipalities (RMs) that currently produce an unsustainable amount of P from manure for the needs of their current crop rotations. In these regions, the Maryland model of manure management, where government pays to defray haulage cost should be seriously considered. Several manure management techniques are discussed in this report that might make even these regions manageable. The use of phytase as a feed additive decreases the amount of P excreted by monogastric animals that are consuming grains high in phytate P. Canadian feed regulations need to be changed so that added P in rations can be reduced before phytase use can substantially reduce P in manure. Another growing management practice is the use of multiple cell lagoons that facilitate the concentration of manure into P dense portion that can be hauled more efficiently to crop land that is in need of P. In P surplus regions this could save millions in reduced hauling costs, but it could require more expensive pumping and application technology.

Project 2: Is it price variability or actual risk? Evaluating risk and risk management strategies in agriculture using different risk measures.
Funding sources: Structure and Performance of Agriculture and Agri-products Industry Policy Network
Abstract:
Risk is traditionally measured by the standard deviation (or the variance) of a series of prices, which is also called volatility. Using this definition, the volatility of prices during a period of time is based on all deviations from the average price (mean) over that period. Several concerns emerge from this traditional framework. First, it implies that agents view positive and negative deviations from the mean as equally undesirable. It also suggests that agents focus on the mean of the distribution as a benchmark. Finally, this approach provides no information about the tails of the distribution and therefore about extreme price movements.

Some risk management researchers, argue that one-sided measures are more relevant in a hedging context than the traditional two-sided measures like standard deviation. These one-sided measures can be more consistent with some individuals' perceptions, but they should be flexible to allow different benchmarks and price targets by individuals (Chen, Lee & Shrestha, 2003).

This study aims to assess historical price risk faced by the major primary outputs of agriculture in Canada. Different measures of price risk will be used, allowing for comparisons across measures and their implication on optimal hedging ratios. Results will help highlight alternative approaches to risk measurement and their implications to risk management strategies.

This study will compute four different risk measures for a set of agricultural commodities: volatility (standard deviation), downside risk (lower partial moment), value-at-risk, and expected shortfall. Optimal hedging ratios will be calculated assuming risk preferences based on each measure listed above. Implications for Canadian risk management options will be discussed. Results from this study can shed light on actual levels of risk faced by Canadian producers and help understand their risk management choices. For example, in a risk management context, hedging models traditionally adopt standard deviations as a measure of risk.

A more comprehensive study on risk measurement and a broader discussion of its results can be beneficial as they may provide insights to help the design of public policies targeting agricultural producers, the improvement of current risk management tools, or the development of new risk management instruments.
2. Innovation Related Publications

In Review


3. Innovation Related Presentations


4. Innovation Related Research Plans for the coming year

Firm R&D Investment in Plant Breeding With and Without Farmer-Saved Seed Levies and Complementarities Between Seed Products and the Breeding Process. See above Graduate Student Project.

Evaluating risk and risk management strategies in agriculture using different risk measures. See Project description above.
1. Innovation Related Research Projects

Project: A productivity Analysis of Aggregate Public and Private R&D Investments in Canadian Wheat and Canola Markets (with R. Gray)
Funding sources: The Alliance for Food and Bioproduct Innovation, (AFBI)
Timeline and progress to date: Summer 2012 - Summer 2014

Abstract:
We perform a comparative analysis of contributions of R&D investments to the total factory productivity in Canadian wheat and canola markets. Our methodological framework involves developing econometric models to quantify and compare the sources of agricultural productivity growth in each sector in a two-step procedure. In the first step, we exploit the sectorial differences to quantify the effects of public policies, institutions, and market conditions, such as intellectual property rights, price policies, and international competitiveness, on private R&D expenditures. In the second step, we analyze the contributions of both public and private R&D investments to the total factor productivity, and quantify the competitive versus complementary nature of each type of investment. Based on estimation results we perform counter factual analysis to evaluate the effects of alternative policies and funding mechanisms on total factor productivity growth. The results of this study will provide producer groups and policy makers with economic information that is essential for identifying strategies targeted to accelerate crop innovation in Canada.

2. Innovation Related Publications

Ryan Cardwell

1. Innovation Related Publications


2. Innovation Related Presentations

Canadian Agricultural Economics Society Annual Meeting Banff, AB, July 2011 "Impact of Market Access Reforms on the Canadian Dairy Industry" • with Anastasie Hacault, James Rude and Jared Carlberg.

Canadian Agricultural Economics Society Annual Meeting Banff, AB, June 2011 "An Empirical Investigation into Trade Biases in Agriculture" • with Matthew Hink and Chad Lawley.

John Cranfield

1. Innovation Related Research Projects

Title: Identifying successful business models, strategies and policies for promoting the Canadian bioeconomy
Funding sources: Ontario Ministry of Agriculture, Food and Rural Affairs
Timeline and progress to date: April 2010 to March 2012

Abstract:
This research builds upon existing efforts within OMAFRA and other provincial ministries to identify gaps, barriers and opportunities in the emerging bio-economy. Emphasis has been placed on developing a deeper understanding of firms’ perceptions of regulation and policy, including the major barriers to commercialization, and on firms’ ability to develop successful business models. The research examines both industry and firm level strategies to promote bioeconomy innovation and to build a successful bioproduct
industry. The research also explores the role of primary agriculture in relation to industrial bioproduction. Results will point to: Recommendations that foster elimination of barriers to growth of the bioeconomy and will contribute to the competitiveness and sustainability of Ontario's bioeconomy. How development of biomass value chains and networks can benefit firms, farm enterprises and contribute to the movement towards a greener Ontario economy.

2. Innovation Related Presentations


Continue with the above mentioned bioproducts project (a one-year extension has been requested) with the aim of undertaking an econometric analysis of factors influencing adoption of bioproducts and processes.

Shon Ferguson

1. Innovation Related Publications


1. Innovation Related Research Projects

Project 1: The Entrepreneurial University and Major Science Governance
Funding sources: Science in Society - Connections and Intersections Award, V-P Research Fund
Timeline and progress to date: Project Awarded Fall 2011. Project Due December 2012.

Abstract:
This research will examine the governance structure of the VIDO and how it has affected the innovative activity that has been undertaken in this organization. The analysis will examine both the formal governance structure and the informal governance structure (i.e., the norms and culture of the organization) to see if a link can be found between the rules that are established, the behaviour of those involved and the outcomes of this behaviour and activity.

Project 2: Governing Major Science Initiatives in Western Canada
Funding sources: Western Economic Diversification
Timeline and progress to date: Final Report June 2011; Final Presentation October 2011.

Abstract:
Governments around the world are investing in and supporting major science projects in an effort to accelerate research, development, commercialization and application of new knowledge and technologies. Universities, hospitals and other non-profit institutions have generally responded enthusiastically, competing to host and operate these investments. This project will undertake an intensive analysis of the theory and analytical methods for examining partnerships involving ‘entrepreneurial’ universities and major science infrastructure. We will undertake case studies of a number of publicly funded scientific projects to identify the strengths, weaknesses, and ultimately best practices, of the rapidly emerging new governance structures.

2. Innovation Related Publications


3. Innovation Related Presentations


4. Innovation Related Research Plans for the coming year

I hope to continue work on the development of an innovation analysis framework. The goal in developing this framework is to provide a simple applied welfare framework within which decisions about publicly-funded agricultural R&D can be evaluated. I also hope to examine the overall performance of the entire food system. While a great deal of attention has been paid to the farm production sector (in which productivity gains have been very large), much less attention has been paid to the rest of the value chain. Understanding the performance of the overall system is critical if we want to enhance its performance to meet the increasing demands for food security.
1. Innovation Related Publications


2. Innovation Related Presentations


1. Innovation Related Publications


2. Innovation Related Presentations


Wilf Keller

Wilf has been actively involved in the development and application of biotechnologies for the genetic modification of crops, particularly canola. He has collaborated with numerous government, university and industry groups and has provided training for researchers in plant biotechnology. He has led major research initiatives on the application of genomics in canola improvement, the development of industrial bioproducts from vegetable oils, and production of bioactive natural products in plants for enhanced human health and quality of life. He has given many presentations and lectures on aspects of biotechnology including public awareness and public education aspects of this emerging field.

Bill Kerr

1. Innovation Related Publications


2. Innovation Related Presentations


W.A. Kerr 2011, Beyond the Photo-op: Agriculture in the Canada-EU Trade Agreement, presented at: Department of Agribusiness and Agricultural Economics, University of Manitoba, Winnipeg, March 2.

Kurt Klein

1. Innovation Related Publications


Anwar Naseem

1. Innovation Related Presentations


1. Innovation Related Publications


2. Innovation Related Presentations


“Place-Specific Policy Interventions (Place-based Policy).” Presented to Faculty of Spatial Sciences Seminar Series, Groningen, Netherlands, April 7, 2011.
1. Innovation Related Research Projects

NEW: Co-applicant, NSERC CREATE for Protecting Canadian's Health: Integrated Training Program in Infectious Disease, Public Health and Food Safety (B. Singh, PI; $1.65 million; matched); 2012-2015.

NEW: Lead, Principal Investigator and Applicant (with James Nolan and Valerie Thompson) CFI # 27856 Experimental Decision Laboratory (EDL) at the University of Saskatchewan: A facility for the study of decision-making in complex, uncertain situations (CFI Contribution: $154,137; total budget $385,342), 2011-16.


CONTININTUING: Co-principal investigator, applicant and co-lead (with D. Castle), VALGEN, Genome Canada ($5.4 million) 2009-13.

2. Innovation Related Publications


3. Innovation Related Presentations


4. Innovation Related Research Plans for the coming year

Cami Ryan

1. Innovation Related Research Projects

Current project: Total Utilization of Flax Genomics (TUFGEN)
Funding sources: Genome Canada

Completed projects:
Synchrotron: knowledge, entrepreneurial and people advantage.” September 15.

Ryan, C. (2011).“Exploring the social and economic costs of zero tolerance policy on the
Canadian Producer.” Final report submitted (partner: SaskFlax) to CAAP. September 6.

Ryan, C. and K. Siddique. “Centerless governance for the management of a global R&D
process: Public-Private Partnerships and Pulse Breeding in Australia and Canada.” Final

2. Innovation Related Publications

Canada.” In Industrial Organization in Canada: Empirical Evidence and Policy

Rights (IPRs) and Knowledge Sharing in Flax Breeding.” Journal of Technology and
Globalization.

to the City: the case of a Natural Resource-based Centre (Calgary).” City, Culture and

Ryan, C. (2011). Launching a social media strategy to advocate for science: is GE3LS*

Ryan, Cami and Stuart Smyth (accepted and forthcoming). “Economic Implications of
Low Level Presence in a Zero Tolerance European Import Market: The Case of
Canadian Triffid Flax.” AgBioForum.

Research and Innovation. For publication by CABI.
3. Innovation Related Presentations


Project: TUFGEN (continues into 2013)
Australian Executive Endeavour Award: As a recent recipient of the Australian Executive Endeavour Award, this funding will be used to support a collaborative research project with the GRDC in Australia in 2012. I will be working side-by-side with the GRDC staff and the Panels to acquire and share knowledge about agricultural innovation and adoption practice in Australia. The collective goal is to understand what drives growers to adopt new technologies, how they are influenced by GRDC strategies and mandates and to document and measure impacts of changes in practice. I plan to be in Canberra working with the GRDC from August 2012 to October 2012.
1. Innovation Related Research Projects

Project: The Regulation of Biofuels in the United States, European Union and Canada
Funding sources: SSHRC
Timeline and progress to date: 2010-2014; data gathering and conference papers proceeding

2. Innovation Related Publications


3. Innovation Related Presentations


4. Innovation Related Research Plans for the coming year

1. Innovation Related Publications


David Sparling

1. Innovation Related Publications


2. Innovation Related Presentations


Sparling D. *Competitiveness of Canada’s agri-food industry. Parliamentary Standing Committee on Agriculture.* Ottawa, Nov.2011. *Invited*

Sparling D. *Preparing for Opportunities. Farm Credit Canada Think Inspiration Series.* Toronto, Nov. 2011. *Invited*


Sparling, D. *New challenges need new approaches for agri-food leaders. Canadian Agricultural Marketing Association.* Webinar September 2011. *Invited*


Sparling D. Canada’s Agri-Food Future. Annual meeting of the Agriculture Council of Saskatchewan. Regina, June 2011. *Invited*

Sparling D. Canada’s Bioproduct Industry 2009. Web and phone presentation to representatives from several federal and provincial agencies. June 2011. *Invited*


Sparling, D. Agri-Food Trends and OMAFRA. Presentation to OMAFRA directors and ADM’s for an OMAFRA Foresight Planning session. Guelph. April 2011. *Invited*


Sparling, D. Global Challenges, Local Change, Canada’s Agri-food Future and Implications for AAFC Communications. AAFC Communications Division Strategic Planning Meeting, Ottawa, Feb. 3, 2011. *Invited*

Bodo Steiner

1. Innovation Related Publications

B. Steiner (2011) 'Contracting in the wine supply chain with bilateral moral hazard, residual claimancy and multitasking'. European Review of Agricultural Economics.


Jim Vercammen

1. Innovation Related Presentations


2. Innovation Related Research Plans for the coming year (2012/2013)

Project 1: Environmental Best Management Practices for Agriculture
Funding: CAIRN and LEARN networks.

Results from the 2011 Farm Environmental Survey (FEMS) and Census of Agriculture will be examined and compared to results from the analogous surveys in 2006 to identify changes in environmental best management practices (BMPs) for Canadian farmers.

Project 2: Student Internships with the BC Agriculture Research and Development Corporation (based in Abbotsford, BC) http://www.ardcorp.ca/
Funding: CAIRN.

One or students from UBC’s Masters in Food and Resource Economics (MFRE) program will complete their four month internship with the British Columbia Agriculture Research and Development Corporation (ARDCORP) from April to August of 2012. Projects have yet to be determined, but will probably involve renewable agri-energy and enterprise traceability.
Project 3: The Economics of Conservation Easements

This project, which has been in progress for the past two years, is expected to be completed during 2012/2013. The project examines how farmers make decisions regarding when to sign a conservation easement versus selling the land for development.

Carina Viju

1. Innovation Related Publications


2. Innovation Related Presentations


4. CAIRN PUBLICATIONS 2011/2012

CAIRN Reports


CAIRN Policy Briefs

I. *The Regulation of Biofuels in the United States, European Union and Canada* - Mondou and Skogstad (April 2012)

II. *Canada's Shrinking Bioproduct Industry* - Sparling, Cheney and Cranfield (February 2012)

III. *Identifying Successful Business Models, Strategies and Policies for Promoting the Canadian Bioeconomy* - Sparling and Cheney (February 2012)

  *Program Spending Returns* - Thompson (April 2011)

IV. *Government Support of Agricultural R&D* - Thompson and Clark (May 2011)

V. *Competitiveness of Canadian Agri-Food Supply Chains* - Sparling and Thompson (March 2011)

VI. *Innovation and Competitiveness* - Sparling and Thompson (March 2011)

VII. *Extension of Honey Bee Pest and Disease Innovations to Canadian Beekeepers* - Lenhardt (April 2011)

VIII. *Some International Successes in Funding Crop Research for Implementation in Canada* - Gray and Bolek (April 2011)
5. CAIRN NETWORKING: CONFERENCES AND WORKSHOPS

CAIRN December Workshop- Banff- December 2011
The CAIRN network hosted a very successful workshop in December 9-10, 2011. It was a great opportunity for graduate students funded by CAIRN to present their research work and get valuable feedback from expert audience. Guest speaker Dr. Martin Entz and all the other speakers made the workshop a good forum for sharing knowledge on “Agricultural Innovation and Regulations”.

ERCA-CAES Policy Conference – Ottawa-January 2012
The Growing Forward in a Volatile Environment Conference was held in January 11-13, 2012 in Ottawa. It was organized jointly by the Canadian Agricultural Economics Society and the five ‘Enabling Research for a Competitive Agriculture’ policy research networks –CATPRN, CAIRN, LEARN, CMD and SPAA. CAIRN organized the session one of the conference and the theme was Adaptability and Regulation. The speaker was Prof. Jeremy de Beer. Interestingly, CAIRN funded students won both 1st and 2nd place at the student poster competition.
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