Poster Abstracts for the Third Annual Canadian Agricultural Policy Conference: Growing Canada's Agricultural Economy: The Role of Trade.

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Poster Title: "An assessment of PEI's Alternative Land Use Services (ALUS) program"

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Abstract:
The government of PEI is the first to implement a province-wide Alternative Land Use Services (ALUS) program in Canada. This voluntary program, which began in 2008, pays annual incentives to farmers to implement better management practices (BMPs) on their privately owned land designed to conserve and protect environmental assets. The goal of this research was to assess the program, and provide recommendations for further development. Surveys were mailed to all program participants (400) and a sample of non-participants (400). Data collected from respondents included information on the land they manage; their involvement in, and perspectives on, the ALUS program and other conservation programs; and their views on land and management issues. Findings indicated that program participants were more likely to be higher income, larger land holders. Participants were more likely to implement BMPs that were included the ALUS program than non-participants, which provides some indication of program effectiveness. Participants were satisfied with a majority of program characteristics; however, a number indicated several changes to program goals, payments, and administration that could improve the program. Non-participants provided a number of suggestions about what would induce their participation in the program.

Poster title: "Incorporating Risk into Conservation Auctions"

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Abstract:
Reverse auctions are an alternative to traditional government programs which attempt to encourage provision of environmentally beneficial goods and services from agricultural producers. There are few practical applications of reverse auctions in Canada. This project aims to add to the understanding of reverse auctions for the provision of BMPs by incorporating cost risk into the auctions. A set of laboratory experiments was conducted to test the effects of risk and uncertainty on participation in the auctions and on bid levels. Auctions were either "risky" or non-risky and subjects were informed what potential variance of risk they face. The experiments were set up as a two by two design; costs could vary by up to 15% or 30% and "risky" periods of the auction would either happen before or after the non-risk periods. Participation levels were very high as in past experimental auctions of the same nature and were not affected by increased risk in cost differences. Bid levels were higher during "risky" rounds. As theory suggests, risk adverse individuals tend to bid closer to their costs in order to have their bid accepted.

Poster title: "The Economic Determinants of Adoption Rates of Conservation Tillage in the Prairie Region in Canada"

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Abstract:
Conservation tillage is an excellent example of success agricultural innovative on the Canadian Prairies. Since its introduction in the 1970s, the rate of adoption of conservation tillage has grown at an impressive rate. Yet the rate of adoption has varied considerably across the different regions in the Prairies. My research project (May to August, 2012), which was funded by LEARN, examined the bio-economic determinants of the rate of adoption of conservation tillage in western Canada. Specifically, I analyzed the factors which best explain the growth in the number of acres under conservation tillage over the past twenty years. The explanatory variables in my regression equation include farm size, farm profitability, farm capital value, soil type, and rainfall. Panel data on farm characteristics were gathered at Census Agriculture Region level from the 1991, 1996, 2001, 2006, and 2011 Census of Agriculture. Data on geographical characteristics were collected from Environment Canada. The dependent variable in my regression is the percentage of acres under conservation tillage.

My analysis establishes that the average farm size, soil type in the region, and the amount of rainfall are important factors explaining the conservation tillage adoption rate. The larger the average farm size, the higher the rate of conservation tillage. And a region with brown and dark brown soil has a higher rate of adoption than a region with black soil. The constructed regression model includes a rainfall variable and

a rainfall – time interaction variable. The most important finding of my research is that the rate of adoption of conservation tillage is inversely related to the average level of rainfall for a region, and this relationship has become increasingly more prominent over time. In the early 1990s there was a similar rate of adoption of conservation tillage across all regions, but in recent years low rainfall regions are adopting conservation tillage at a much higher rate than high rainfall regions.

Poster Title: "Assessing the effectiveness of an Alberta-based agri-environmental extension service"

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Abstract:
The Natural Advantage Program (NAP) was an agricultural extension service offered by the Alberta branch of Ducks Unlimited Canada to Alberta-based producers between 2007 and 2008. This voluntary program provided producers with farm-specific recommendations on actions they could adopt to improve their on-farm wildlife habitat and biodiversity, and sources of assistance they could access to help them implement those actions. To date, external evaluations of such stewardship programs in the Canadian context have been limited. The goal of this research, then, was to evaluate the efficacy of the NAP and to provide recommendations on how to improve program design and conduct a program evaluation. Personalized surveys were developed to assess action completion, assistance access and related individual- and farm-level characteristics. Findings indicate that respondents were similar in age to the average Albertan producer, but had more years of education and were more likely to have completed an environmental farm planning exercise. Program participants completed an approximate average of 3.3 actions per individuals, while non-participants completed an approximate of average of 1.3, suggesting some degree of program efficacy. Participant completion rates for recommended actions ranged from 20% to 81%, while access rates for recommended forms of assistance ranged from 0% to 39%. Findings indicate that NAP participants who operated large farms, owned their land or participated in a watershed group were most likely to have adopted recommended actions. The actions most likely to be adopted were those requiring a relatively low investment of time or money, and those with obvious private benefits. Key reasons for non-adoption and non-access were similar, and included concerns over the required investment of time and money, and the relevance of the recommendation to their farm.

Poster title: "On-farm economic impacts of agricultural business risk management programs on incentives to adopt beneficial management practices"

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Abstract:
Risk management and environmental stewardship are key components of Canadian agricultural policy. However, these two policy areas are not "coupled" in terms of producer participation and the policy objectives may not be compatible. Canadian research has shown that participation in public business risk management (BRM) programs (e.g., crop insurance) stabilize producer returns as well as enhance them (i.e., subsidization effects). Production practices and land uses that contribute positively to environmental stewardship (i.e., beneficial management practices or BMPs) often result in net costs for producers. BRM program participation may result in greater financial disincentives to adopt BMPs. Consequently, increased environmental program costs (i.e., economic incentives) may be necessary to achieve socially optimal levels of BMP adoption by producers.
This project aims to quantify the net economic impact of participation in Canadian BRM programs on incentives to implement land use changes that contribute to ecosystem service production on agricultural operations. Dynamic Monte Carlo simulation is used with capital budgeting techniques to estimate the impact of BRM participation on the feasibility of BMP adoption. Operations representative of commercial agriculture in Alberta form the basis for analysis; these include cropping, mixed (i.e., crop and cow-calf) and intensive livestock production operations.
Preliminary results indicate that BRM program participation reinforces the net private benefits (positive or negative) associated with BMP adoption. That is, for BMPs that contribute positively to farm wealth (e.g., crop rotation) benefits of adoption are further increased when combined with participation in BRM programs, with the opposite being true for BMPs that decrease farm wealth (e.g., buffer strips). Based on the simulation results, implications for policy development are discussed.

Poster title: "How do restrictions on foreign ownership affect price: Empirical and theoretical analyses of the Saskatchewan Farmland Security Act"

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Abstract:
This poster shows that policy that forbids foreign ownership of farmland has a demonstrable effect on price. The empirical section of the poster compares annual price changes of farmland in Alberta and Saskatchewan using difference in differences methods. We use exploratory data analysis to motivate and justify two hypotheses: average price changes in Saskatchewan became lower than Alberta after the policy was introduced, or the average absolute value of price changes in Saskatchewan became lower. We find evidence that policy caused the absolute value of price changes to become smaller, that is, the policy dampened price changes in Saskatchewan. Since Saskatchewan prices were dampened by policy, we use Alberta price changes as an estimate for what Saskatchewan would experience without the

policy. This suggests Saskatchewan farmland is underpriced by $431/acre as of 2011, which is 73% of observed price. We find no evidence that policy caused the average price changes to decrease, which suggests that prior research found the effect of policy to be statistically and economically insignificant because of misspecification. The poster also discusses how to represent the effect of the policy in a supply-demand diagram. In a static model, the policy represents a grain for domestic farmland buyers. It is not clear if there is a net benefit, so this could represent regulatory capture. In a dynamic model, we show that policy will dampen price changes if the foreign and domestic demand curves both have the same sign; if not, then the policy can accentuate price changes. This research provides evidence that policy has affected farmland prices in Saskatchewan. This improves our understanding of the effect of trade restrictions and draws attention to the issue of foreign ownership. Policy may have also created pent up demand, which may have created the risk of a hot money problem if policy is changed carelessly.

Poster title: "Investigating the feasibility and acceptability of TDC's in the BHI"

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Abstract:
Future growth is an important factor that must be considered when it comes to city planning. Strathcona County, Alberta is a unique case in that it has experienced high rates of growth in the past decade and they are expected to continue into the next 20 to 30 years. This area is also unique in that it is comprised of a number of different lifestyles (e.g. urban, estate, rural) and a number of different types of land (e.g. developed, agricultural, protected and unprotected natural habitat, private and public lands). As a result, there are many competing factors that will influence how development happens on the landscape, and the subsequent effects of development on the environment and the social community.

In order to accommodate the additional population that is expected to immigrate into Strathcona County, a Transfer of Development Credit (TDC) program has been proposed as a tool to manage growth and protect environmental amenities. In this study, a simulation model was developed to compare different TDC scenarios (4) with the base case scenario which assumed current city planning densities over a 20 year period. It was found that, after 20 years, the implementation of a TDC program was able to accommodate the additional growth while limiting the conversion of natural lands, as well as increase tax revenues to the city. The degree of these figures differed between the different TDC scenarios tested.

Another important aspect of these development scenarios is the public support for development in the area. To investigate this issue, a stated preference choice experiment was developed to illicit the publics' willingness to trade-off the protection of natural lands with development and residential density. Levels for attributes were derived from the simulation exercise. It was found that the public

preferred low density development, and conservation of natural areas. This information will aid in the development of a TDC program (or other planning programs) that is acceptable to the public.

Poster title: "Developing Financial Weather Derivatives for Prairie Farmers"

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Abstract:
Crop insurance programs have traditionally been used to protect farmers in western Canada from the vagaries of weather, but such programs are characterized by adverse selection and moral hazard. Adverse selection occurs when the costs of insurance for some farmers exceed their expected benefits, so they do not voluntarily participate in crop insurance because they are able to cope with adverse weather. Only farmers who are likely to claim benefits would participate. Requiring all farmers to participate eliminates this problem, but at a cost to society. However, no crop insurance program can eliminate moral hazard, which occurs because, once farmers participate in crop insurance, they take no steps to reduce their exposure to adverse weather; the farmer's decisions are contrary to the desires of the insurer – farmers take on risks they would otherwise avoid.

Financial weather derivatives eliminate problems of adverse selection and moral hazard since neither the behavior of farmers nor participation rates can influence weather outcomes. The only drawback relates to basis risk – the risk that payoffs do not correspond to the underlying exposures (e.g., the farmer is exposed to adverse weather but the instrument used to indicate exposure indicates otherwise). The problem is to design appropriate weather derivatives acceptable to farmers. To do this, we examine two potential financial weather products – growing degree days (number of days when temperature exceed 5 ^{o}C) and excessive heat days (days temperature is above 38 5 ^{o}C).

To determine the potential of these financial weather derivatives for protecting farmers, we employ a 40-year (1970-2000) simulation model that utilizes a 10-year moving average of Saskatchewan RM-level crop yields, realized yields and prices, and realized weather information for the growing season. We begin by postulating that farmers can purchase options to sell growing degree days and/or excessive heat days over-the-counter or in a futures market. We then determine the extent to which these financial options can stabilize a farmer's income, protecting her in particular from downside yield risk.