

# CAIRN WORKSHOP 2013

*January 23, 2013. Chateau Laurier. Ottawa, ON*

## **More Information on Session Topics**

### **CAIRN Publications related to session 1 & 2**

The Privatization of British Wheat Breeding: What can Canada learn?  
Galushko and Gray (2013)

[http://www.ag-innovation.usask.ca/cairn\\_briefs/publications.html](http://www.ag-innovation.usask.ca/cairn_briefs/publications.html)

Farmer-Funded R&D: Institutional Innovations for Enhancing Agricultural Research  
Investments by Alston, Gray and Bolek (2012)

[http://www.ag-innovation.usask.ca/cairn\\_briefs/publications.html](http://www.ag-innovation.usask.ca/cairn_briefs/publications.html)

### **Presentations related to session 1&2**

The Privatization of Wheat Research in the UK: Lessons for Canada by Viktoriya  
Galushko and Richard Gray (2013)

<http://words.usask.ca/cgpc/presentations/>

### **CAIRN Publications related to session 4**

#### 2013

Historical Review of Agricultural Efficiency Studies- Darku, Malla and Tran  
Historical Review of Agricultural Productivity Studies -Darku, Malla and Tran

#### 2012

Stochastic Frontier Approach of Measuring Agricultural Productivity & Efficiency:  
Accounting for Innovations - Darku, Malla and Tran

Sources & Measurement of Agricultural Productivity & Efficiency in Canadian Provinces:  
Crops & Livestock - Darku, Malla and Tran

[http://www.ag-innovation.usask.ca/cairn\\_briefs/publications.html](http://www.ag-innovation.usask.ca/cairn_briefs/publications.html)

## Abstract 1

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### **Evaluating the Impacts of Transportation Policy Changes: Adaptation and Technology Adoption on the Canadian Prairies**

Shon Ferguson<sup>1</sup> and Rose Olfert<sup>2</sup>  
<sup>1</sup>IFN Stockholm, <sup>2</sup>University of Saskatchewan

In 1995 the Canadian Government removed a century-old railway transportation subsidy for the export of grains from the prairie region of Canada, resulting in substantial increases in freight rates for wheat and other export grains. The substantial spatial variation in these one-time freight rate increases can be exploited to evaluate the impact of the policy change on farm output and the adoption of innovations in production technology such as zero-till and continuous cropping. Utilizing extensive Census and independent freight rate data for approximately 400 finely detailed spatial units across Alberta, Saskatchewan and Manitoba, we find that average farm size and exit increased faster in the most afflicted regions. We do not find evidence that higher freight rate increases led farmers to adopt zero-till technology, but did lead to a higher incidence of continuous cropping and fertilizer use. Farmers in areas with the greatest freight rate increases adapted by growing less wheat, but they did not increase their livestock production.

## Abstract 2

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### **The Adoption of Conservation Tillage Innovation on the Canadian Prairies**

Lana Awada  
University of Saskatchewan

One of the major innovations in Canadian agriculture over the last five decades has been the introduction of conservation tillage. Conservation tillage -- a term that includes minimum or mulch tillage and zero-tillage (ZT) -- was mainly introduced to combat land degradation and promote agricultural sustainability. By the end of the 1970s, conservation tillage, with all its components, had taken shape and was ready for adoption on the Prairies. Although some farmers had adopted ZT by the late 1970s and had found it profitable, this technology was not adopted on any major scale until the 1990s.

This thesis addresses the puzzle of why, if there was evidence of profitability, did the majority of farmers not adopt ZT during the 1980s. To solve this puzzle, this study examines the distributional consequences of ZT technology across both the different

sectors involved in the provision of ZT and the different farmers that adopted this technology. In other words, this study determines the sectors that gain or lose from the adoption of ZT technology, and identifies the characteristics of farmers that affect the adoption of this technology.

To analyze the distributional impacts across the different sectors, an equilibrium displacement model is built to examine the welfare implications of the switch from traditional tillage to zero tillage on agricultural input suppliers in the spring wheat industry in 1989. The results reveal that the move to zero tillage decreases the rent accruing to the fuel sector, increases the rent received by the owners of land, machinery, herbicide and other variable inputs (e.g., seed, fertilizer), and has no effect on the rent to farm-owned labour. The aggregate change in the return to the industry is positive, with most of the increase accruing to land owners. Two critical factors of ZT profitability were land ownership and the effectiveness of ZT equipment technology. Therefore, there is evidence that ZT was profitable for the group of farmers who own land and found the ZT equipment effective in 1989.

To examine the distributional impacts across the different farmers, a heterogeneous farmer decision-making model is built under a waiting option framework. The theoretical model shows the importance of neighbourhood and farmer characteristics in the adoption of zero tillage. Neighbourhood and farmer characteristics factors are empirically tested using a panel dataset from 1991 to 2006 constructed at the census consolidated subdivision (CCS) level for the three Prairie provinces -- Alberta, Saskatchewan and Manitoba -- of Canada. The results of the empirical analysis show that CCSs closer to other CCSs with relatively high adoption of ZT tend, themselves, to have higher ZT adoption over time (neighbourhood effect). The results also show that education, farm ownership, large farm size, and soil erosion-high risk level positively influence the percentage of land under ZT technology. Distance to research station and brown soil type are found to be negatively impact the percentage of land under ZT.

Knowing the distributional impacts of technical change across the different sectors and across the different farmers is an important element to policy-makers and other groups involved in funding agricultural R&D investment decisions.

Awada, L. 2012. The Adoption of Conservation Tillage Innovation on the Canadian Prairies. PhD thesis, University of Saskatchewan, Saskatoon.

*Canadian Agricultural Innovation and Regulation Network*

<http://www.ag-innovation.usask.ca/index.html>

