

**THE ECONOMIC DETERMINANTS OF CONSERVATION TILLAGE ADOPTION RATES IN THE PRAIRIE REGION OF CANADA**

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## Introduction

Conservation tillage is an excellent example of successful 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. This research examined the bio-economic determinants of the rate of adoption of conservation tillage in western Canada.

## Research Questions

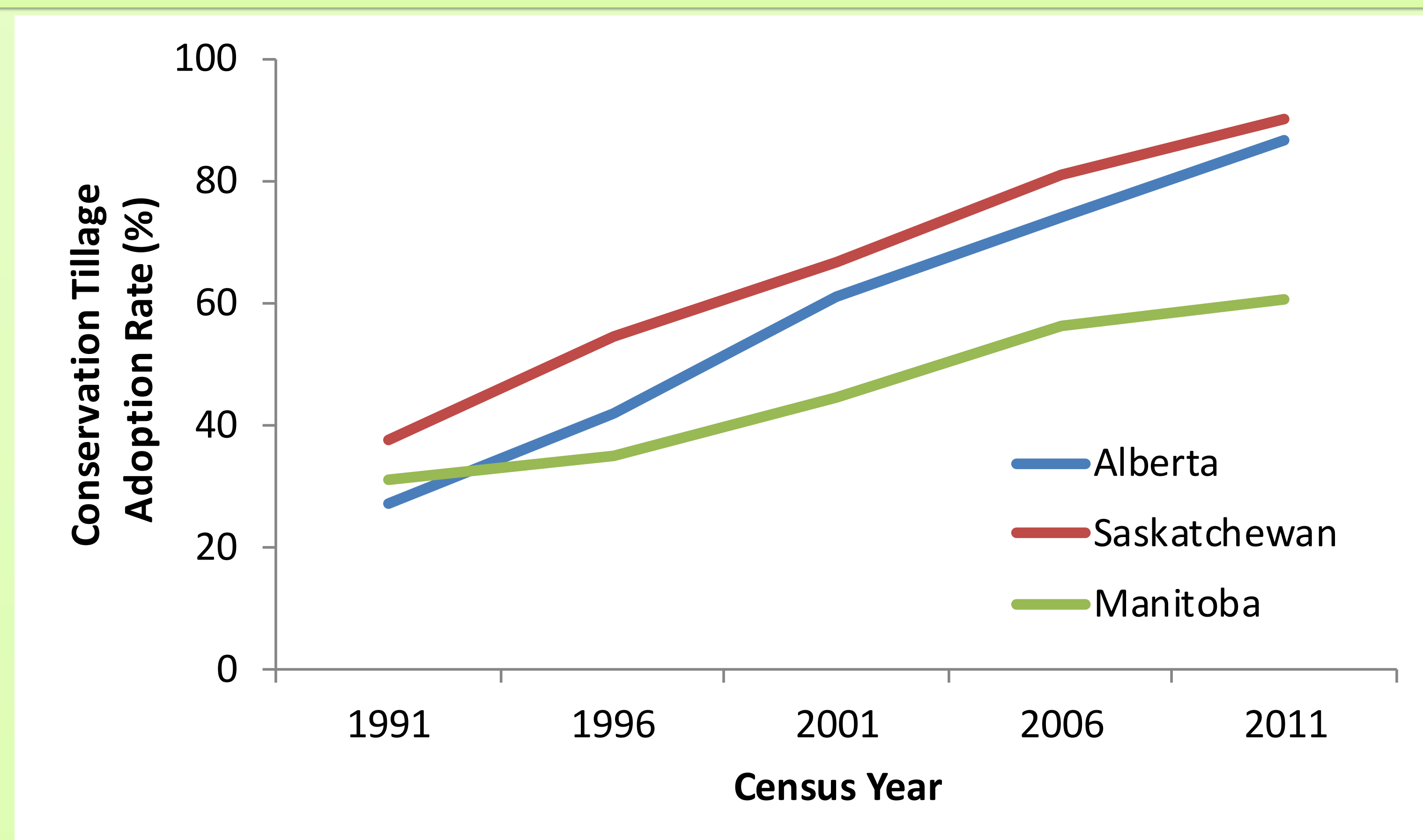
1. What are the factors which best explain the growth in the number of acres under conservation tillage over the past twenty years?
2. What is the regional variation in the rate of adoption?

## Panel Data

Number of Census Regions: 40 CAR (Census Agriculture Region)  
Total Number of observations: 200

1. Tillage area and farm characteristics at Census of Agriculture level - Census of Agriculture by Statistics Canada (Year 1991, 1996, 2001, 2006, and 2011)
2. Rainfall data from 111 weather stations in the Prairie regions – Environment Canada
3. Soil maps - Agriculture and Agri-Food Canada and Government of Alberta website

## Conservation Tillage Adoption Rate



## Econometric Model

Linear regression model is used:

$$y_{it} = \beta_0 + \beta_1 X_{it1} + \dots + \beta_k X_{itk} + u_{it}$$

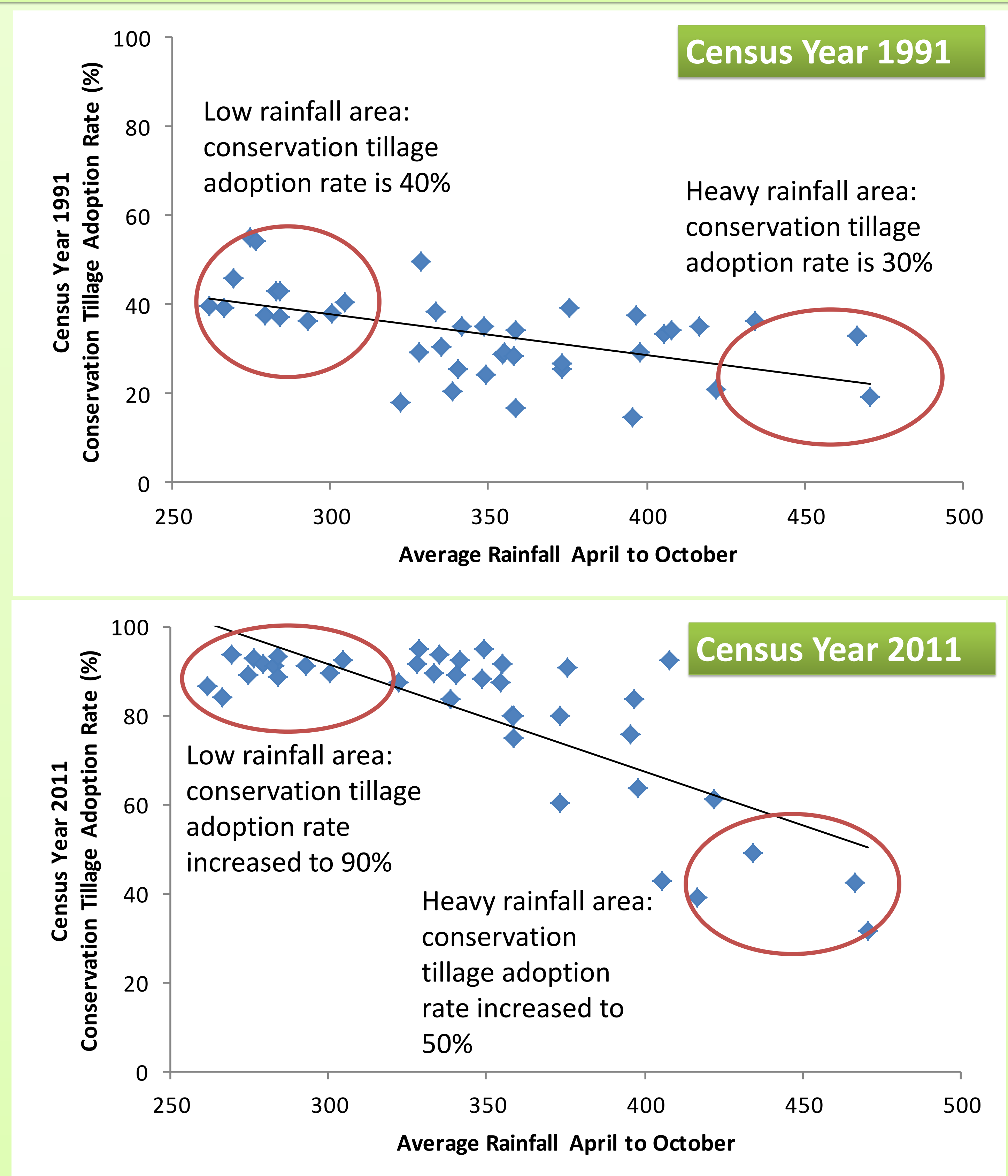
## Econometric Results

Dependent Variable : Percentage of conservation tillage adoption			
Independent Variable	Coefficient		Standard Error
Average Farm Size	0.02	**	0.01
Soil Type	-3.02	***	0.91
Year 1996	34.22	***	13.37
Year 2001	57.58	***	14.16
Year 2006	78.64	***	13.91
Year 2011	118.66	***	13.74
Rain Fall in Year 2001	-0.10	**	0.04
Rain Fall in Year 2006	-0.11	***	0.04
Rain Fall in Year 2011	-0.20	***	0.04

\*\*\*Significant at the 1 percent level, \*\*Significant at the 5 percent level

Independent variables also included average farm size, capital value per acre, net revenue per acre, soil type, average rain fall, and year dummy variables.

## Conclusions



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 adoption rate.
- Regions with brown and dark brown soil have a higher adoption rate than a region with black soil.
- Adoption rate of conservation tillage is inversely related to the average level of rainfall for a region. This relationship has become increasingly more prominent over time.