# Controlling Potato Supply and Price Volatility – Does it Work? Empirical Evidence from Idaho

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## Introduction

Declining demand for fresh potatoes, high price volatility and returns that do not cover the cost of production caused Idaho potato growers to form a marketing cooperative in the fall of 2004.

United Fresh Potato Growers (http://www.unitedpotato.com/)

Goals:

- to stabilize supply of fresh potatoes in Idaho
- to provide fair returns to potato growers

## Capper-Volstead Act -

Agricultural producers are allowed to act collectively

United Fresh Potato Growers of Idaho - A cooperative formed to stabilize fresh potato supply and prices.

- The cooperative formed to combat low prices and high price volatility
- Founded in November 2004
- Represents 85% of fresh potato growers in Idaho
- Targets both production and marketing of fresh potatoes

## United's Supply Management Program

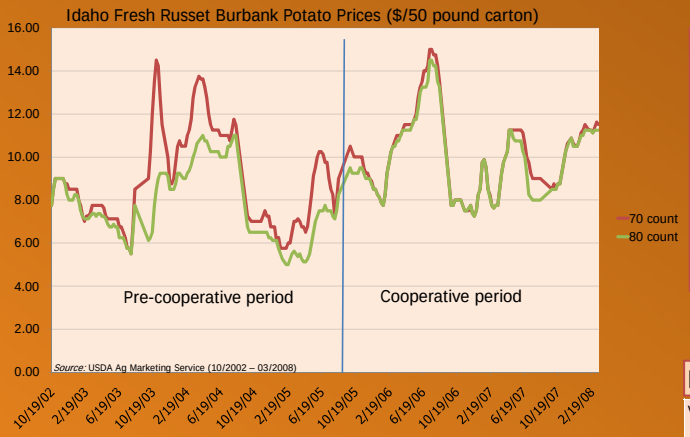
1) Potato acreage management program
- controls the number of acres of fresh potatoes planted
- The fresh potato acreage was reduced by 15% in Spring 2005 relative to the 2004 base
- Bid buy-down program

2) Marketing programs
- Potato flow control throughout a marketing year
- Limits the flow of potatoes to the market when prices are low
- Exchange of marketing information
- Secondary marketing strategies
- Divert excess supply of already produced potatoes

## Research Objectives:

To evaluate the effectiveness of programs and strategies implemented by the United Fresh Potato Growers of Idaho – To answer the question: were the cooperative's efforts successful?

Has the fresh potato price level and volatility changed since the cooperative began operations?




## Hypotheses:

Effective implementation of the potato supply management program should lead to higher and less volatile fresh potato prices

H1: Fresh potato prices are higher in the Cooperative period relative to the Pre-Cooperative period

H2: Fresh potato prices are less volatile in the Co-operative period relative to the Pre-Cooperative period

## Data

1) Weekly Russet Burbank shipping point prices
- Upper Valley Twin Falls – Burley, District Idaho
- Prices received by potato shippers, potato growers-shippers and independent potato shippers
- 2 weekly Russet Burbank price series; prices are in $ per a 50 pound carton (70 counts and 80 counts per carton)

2) Monthly Idaho Prices for Fresh Potatoes


## Empirical Model

ARCH(1) and GARCH (1,2) mean equation

$$p_t = \psi_0 + \psi_1 p_{t-1} + \lambda p_{t-1} Co\text{-}op_t + \chi Co\text{-}op_t + u_t$$

ARCH (1) variance equation

$$u_t^2 = \alpha_0 + \alpha_1 u_{t-1}^2 + \eta Co\text{-}op_t + w_t$$

GARCH (1,2) variance equation

$$h_t = \xi + \delta_1 h_{t-1} + \gamma_1 u_{t-1}^2 + \gamma_2 u_{t-2}^2 + \mu Co\text{-}op_t$$

## Results of the ARCH/GARCH estimation

| Variables | Monthly Idaho Prices for Fresh Potatoes ($/cwt) | Russet Burbank Idaho Weekly Shipping Point Prices ($/50 pound carton) | |
|---|---|---|---|
| | | 70 Count | 80 Count |
| | ARCH(1) | GARCH(1,2) | |
| Price Level Equation | | | |
| Estimated coefficient for the co-op binary variable | 2.53* (2.24) | 0.58* (2.68) | 0.59* (5.67) |
| Price Variance Equation | | | |
| Estimated coefficient for the co-op binary variable | -0.336* (-2.19) | 0.001 (0.03) | 0.011* (3.53) |

Z statistics are in parentheses. * indicates significance at the 10% level using a two-sided Z-test

## Summary

Price Increases – Statistically significant in all categories
Variance Increase – Statistically significant for 80 count
Variance Decrease – Statistically significant for Monthly prices

## Conclusions

United's efforts have been successful in increasing prices paid to growers

Impacts on price variance are mixed and depend on the price series examined

The monthly Idaho price series, which more closely resembles the composite price that growers receive, showed an increase in price level and a decrease in price variance, indicating that potato growers are better off.

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Full text of this research can be found at:
Bolotova, Y., K. Muthusamy, C.S. McIntosh and Paul E. Patterson. 2008.
Is Stabilization of Potato Price and Supply Effective? Empirical Evidence from Idaho.
Agricultural Economics Research Series #08-04; Department of Agricultural Economics & Rural Sociology, University of Idaho, Moscow, ID.
http://www.ag.uidaho.edu/aers/PDF/AERS/2008/AERS08-04.pdf

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