

**From the ground up: are farmers cultivating the seeds of
change?**

Agent-based modeling of farming and rural change in Western Canada

Tyler Freeman
Dept. of Agricultural Economics
University of Saskatchewan
Saskatoon, Saskatchewan, Canada

April, 2005

Significant structural change continues to occur at the farm level in Canada. While poorly understood, these changes appear to be due to a number of factors that are both endogenous and exogenous to the farm. Farm characteristics like operator age, land tenure, farm type, farm size, debt level and motivation vary widely across Canada (Statistics Canada), and it is clear that these factors are key drivers of farm industry structure. Given the economic difficulties now inherent in Canadian agriculture, there has never been a more important time to improve our understanding of the structural dynamics of the farming sector.

Our previous research recognizes that at the farm level, there are a number of potential drivers for rural structural change. These include 1) the presence of economies of size and scale, 2) technological change and 3) increasing lifestyle expectations and income. But one key endogenous factor that has not been fully explored is the fundamental and intrinsic difference in farming “management style.” Much anecdotal evidence exists among agricultural professionals as to how differences in farm decision-making lead to a distinct farm management style, and how this impacts farm success or failure (Jensen, 1977).

While there are a several management attributes that can be modeled at the agent level, we offer that management style in farming should encompass; 1) a willingness to accept/or reject the current situation or status quo, 2) a willingness/unwillingness to act or respond under incomplete information and to accept risk (entrepreneurship), and 3) a view of farming as business/life style. Clearly, these attributes are not always independent and may in turn be influenced by a number of demographic and economic factors.

The focus of this research is to extend the dynamics of individual farm households/managerial units by focusing on the impact of varied “management styles”. We hope to better understand how management diversity impacts agricultural structure on a regional level. By building on our understanding of agrarian regions as a complex system, issues related to the limitations of prior farm-level modeling and policy analysis can be assessed in relation to our simulation results generated by agent-based modeling.