

# Modelling the IPM Technology Adoption Decision

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## From Pesticides to Integrated Pest Management ?

### Technology Adoption – An Introduction

Most studies find that large organisations (including large large farms) are more likely than smaller ones to be early adopters of new technology, because of greater slack resources (McDade et al., 2002). First, there is the decision whether to adopt a new technology or not. Second, there is the consideration of the extent to which the capabilities of the new technology will be exploited, which is referred to as the “depth” of adoption. Finally, the replacement speed of old technology with new needs to be considered, and this is often linked to sunk investment costs associated with new technology.

### Models of Technology Diffusion

There are four broad classes of models which can be considered to analyse technology diffusion (Geroski, 2000):

- The epidemic model assumes that limits to the speed of usage of new technologies are linked to lack of information about the new technology, how to use it and what it does;
- The probit model which assumes that different firms (or farms), with different goals and abilities, are likely to want to adopt the new technology at different times. Diffusion occurs as firms of different types gradually adopt the new technology;
- The third class of models includes models of density dependence (used by population ecologists), where the twin forces of legitimation and competition help to establish new technologies and ultimately limit their take-up;
- The final set of models considers the manner in which initial choices between different variants of the new technology affect the subsequent diffusion speed of the chosen technology. These models often involve information cascades, which drive herd behaviour in terms of technology adoption when a particular type of technology is finally selected.

### Exploratory Case-Study of Farmers’ Decision-Making

In order to understand the dynamic process of farmers’ adoption of a new pest management technology, a qualitative survey using unstructured interviews is used in this exploratory phase. Early adopters of integrated pest management strategies are interviewed to analyse their decision process, aptitudes to risk, personal interest in the technology and to collect useful “unexpected hints” about their decision-making.

#### Objectives

- Provide a conceptual model of the specific alternative pest management technology adoption process
- Characterise potential early adopters of alternative pest management strategies
- Identify the likely key barriers to adoption of new pest management technologies
- Identify key information needed by farmers for effective adoption decision-making

#### Methodology

- Exploratory case-study of adopters and non-adopters of bio-control in
  - Protected glasshouse systems (strawberries, tomatoes, cut flowers, etc.)
  - Non-protected soft fruit or baby leaf/salads systems
- Non-directive, unstructured interviews, grounded in an interpretive epistemology

#### Output

- Understanding the experiences of early adopters, attitudes and key aspects affecting decision making
- Identification of the best appropriate methodology to design and conduct the broader survey

Combining insights to develop a series of hypotheses

Survey design to investigate the adoption process at a broader scale (field crop systems, namely cereals)

**Project: “Re-bugging the system: Promoting Adoption of Alternative Pest Management Strategies in Field Crop Systems”**