Identifying Opportunities for Improved Adoption of New Grazing Innovations

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Introduction

Those aiming for high levels of adoption of grazing-related innovation are often frustrated at low and slow uptake by farmers. This paper describes a new tool, ADOPT (Adoption and Diffusion Outcome Prediction Tool), that can be used to evaluate the potential adoptability of grazing innovations (Kuehne *et al.* 2012). ADOPT aims to: (1) predict an innovation's likely peak level of adoption and likely time for reaching that peak; (2) encourage users to consider factors affecting adoption during project design; and (3) engage R, D & E managers and practitioners by making adoptability knowledge and considerations more transparent and understandable.

Discussion

ADOPT has been developed in response to the recognition that many significant investments in agricultural R, D and E are optimistically made, but without strategies for understanding the adoption process or predicting likely levels of adoption. ADOPT is based on a conceptual framework that combines established adoption and diffusion principles (Lindner 1987; Feder and Umali 1993; Rogers 2003; Pannell *et al.* 2006) to encourage a more complete understanding of the influences on adoption and diffusion. This improved understanding allows attributes of the innovation or the extension strategy to be modified so that levels of adoption and diffusion can be improved. Users of ADOPT undertake a structured process of responding to twenty-two questions related to a conceptual framework (Fig. 1). Responses are then used in equations and functions that provide a numeric representation of how the conceptual framework variables relate to each other, and how they influence *Time to Peak Adoption* and *Peak Adoption Level*. The expected diffusion of the innovation is graphically represented using an S-shaped cumulative adoption curve (see Griliches 1957; Marsh *et al.* 2000).

ADOPT encourages a process of learning, promotes users' engagement with adoptability issues and challenges users to think more deeply about the definition and characterisation of both the innovation under consideration and the target population of potential adopters. The literature shows that influences on adoption can be conceptualised as related to either: (1) learning about relative advantage; or (2) the actual relative advantage. Similarly each influence can also be characterised as being related to: (1) the population; or (2) to the innovation (see Fig. 1). The conceptual framework at its simplest is four quadrants. The two left-hand quadrants—*Population-specific influences on the ability to learn about the innovation* and the *Learnability characteristics of the innovation*—only influence the time taken to reach peak adoption; they do not influence the peak adoption level. The right-hand quadrants *Relative advantage for the population* and the *Relative advantage of the innovation* influence both the peak adoption level and the time taken to reach peak adoption (Griliches 1957). Extension professionals and others working to promote the adoption of grazing innovations with farmers will find that the two left hand quadrants are where they have the greatest opportunity to influence adoption outcomes (Fig. 1). The variables that contribute to those quadrants are discussed in more detail below.

Learnability of the Population Quadrant

This quadrant is focused on the *population-specific influences on the ability to learn about the innovation*. This is important because adoption is a learning process

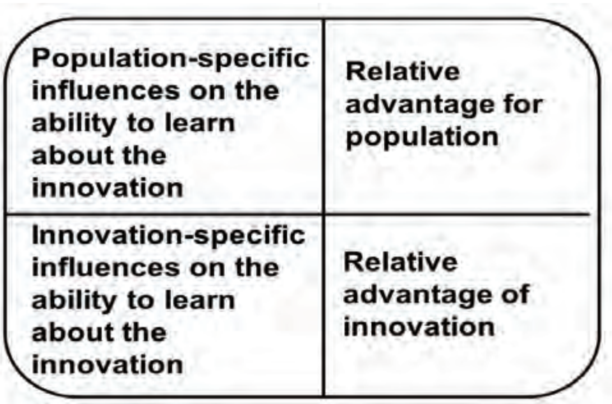

Figure 1. The conceptual framework

where farmers gather information, reassess their beliefs about the innovation under consideration and review their decision whether adoption will be of net benefit or not. The four variables contributing to this quadrant are: (1) Group involvement which is aimed at the extent to which the target population is involved with peer learning networks, (2) Advisory support which aims to uncover how much the target population uses advisors for advice relevant to the innovation; (3) Relevant existing skills and knowledge which captures whether potential adopters will need to spend time developing new skills and knowledge before they can gain the expected advantage from the innovation, 4) *Awareness* which captures the target population's existing awareness of the innovation.

Learnability Characteristics of the Innovation Quadrant

This quadrant is about the *innovation-specific influences on the ability to learn about the innovation*. It has three variables: (1) Trialability which ascertains if small-scale trials are possible; (2) Innovation Complexity which identifies whether adopting the innovation requires complex changes to the farming system; and (3) Observability which focuses on whether any use of the innovation in a district is easily observed.

Relative Advantage for the Population Quadrant

This quadrant is about *establishing whether the potential advantage gained from adopting the innovation* is a sufficient motivation to shift the population towards adoption of the innovation. The six variables are: (1) Enterprise Scale; (2) Management horizon; (3) Profit Orientation; (4) Environmental Orientation; (5) Risk Orientation; and (6) Short-term constraints. Extension programs can not usually influence these factors in a population but considering their influence may encourage targeting of particular sub-populations.

Relative Advantage of the Innovation Quadrant

This quadrant deals with the relative advantage of the innovation that are derived from the innovation's inherent characteristics. The nine variables are: (1) Relative upfront cost of innovation; (2) Reversibility of innovation: (3) Profit benefit in year that it is used; (4) Future profit benefit; (5) Time for future profit benefit; (6) Risk effect; (7) Environmental costs and benefits; (8) Time to environmental benefit; and (9) Ease and convenience. These variables can sometimes be changed at the project design and development stage.

Conclusion

ADOPT provides a structured way of considering the innovation and the target population to identify where opportunities exist to improve adoption and diffusion. In addition to the existing version being developed for Australian agricultural R, D & E (www.csiro.au/adopt) there is a version for international smallholder agriculture in development.

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