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EVALUATING GRAZIER KNOWLEDGE OF SEASONAL CLIMATE FORECASTING IN THE MITCHELL GRASSLANDS OF WESTERN QUEENSLAND

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ABSTRACT

Similar surveys were conducted in western Queensland in 2000 and 2003 to compare graziers' knowledge and use of climate information and seasonal climate forecasting. There was a decline in knowledge of using self-rating questions and an increase in knowledge using test questions. Graziers preferred to access their climate information via the Internet, email and targeted newsletters.

INTRODUCTION

In 2000, as part of a Natural Heritage Trust project entitled "Sustainable grazing – balancing resources and profit in western Queensland", a survey of graziers in the Mitchell grasslands of western Queensland benchmarked graziers' understanding of the use of climate information in relation to grazing management decisions. The results of this survey also helped to make important changes in project planning, activities and methods of transferring technology, tailored to grazer preferences (Keogh *et al.* 2003). A similar survey was conducted at the start of 2003. The results from this survey enabled a comparison of graziers' knowledge and use of climate information over the duration of the three-year project. This paper presents the comparison between the two surveys to determine the change in use, knowledge and attitude in relation to seasonal climate forecasting and other climatic phenomena.

MATERIALS AND METHODS

The first survey in November 2000 involved 100 randomly selected graziers in seven shires of western Queensland. Both mail and phone techniques were used with a 43% response rate (Keogh *et al.* 2004). In March 2003 a similar survey was conducted by mail and all respondents of the first survey were asked to complete the second, and of the remaining graziers, about 13% were randomly selected from each shire. One hundred and forty one graziers were selected with 49 responses being received (35% response rate).

Self-rating (scale of 1 to 10) and test question (multiple choice) techniques were used in both surveys to determine knowledge and use of climate systems. In addition graziers were asked questions to determine their preferred information sources and use of electronic media. Chi-square tests were used to test for independence of counts and *t*-tests were used to compare ratings on a scale of one to ten. A significance level of 5% was used.

RESULTS

In the self rating questions knowledge of a range of climate phenomena declined in all areas over the three years. Response rates of "Sources of weather and climate information" were highest while "Probability of exceedance" was rated the lowest.

In the test question section there were three questions identical in both surveys. Results showed improved knowledge in the second survey compared to the first. The question "The Southern Oscillation Index in an El Niño year is?" was the only question that showed statistical significance with the percentage of correct answers increasing from 68% in 2000 to 89% in 2003. The question "In western Queensland, ENSO has the largest impact on?" showed that while the number of correct

answers increased from 11% to 33%, many graziers are still unaware that El Niño/Southern Oscillation (ENSO) has a larger impact on pasture growth than rainfall.

Graziers prefer to access their climate information via the Internet, email and print media. The results from the second survey indicated higher use of these methods compared to the first survey. The number of respondents with Internet access also increased from 75% to 86% in the second survey, however this result was not significantly different. "Fax back" decreased from 39% in 2000 to 12% in 2003 ($P < 0.05$).

DISCUSSION

Self-rating questions portray graziers' perceptions of their knowledge. These results indicated that there was a small decline over the three years. We suspect this was due to 'optimism bias' where people tend to hold overly favourable views of their abilities in many social and intellectual domains (Kruger and Dunning 1999). In this instance graziers rated their own knowledge and skill higher at the beginning of the project, but once they learnt more about climatic concepts and their applications, they realised that their knowledge wasn't as high as initially thought. This explains the apparent decline in knowledge that was evident in the self-rated section of the second survey, but was not evident in the test question section.

The upward trend in knowledge shown by using the test questions indicates that the climate project activities completed between 2000 and 2003 may have contributed to the increase in knowledge and awareness of climatic concepts in western Queensland. As there was no perception involved with these questions, the results also provided us with valuable information in terms of gaps in knowledge that graziers may have in relation to climate information.

The results from the first survey indicated that graziers prefer to access their climate information through the Internet, email and newsletters. This prompted us to move our extension activities away from workshops and field days and begin publishing a quarterly newsletter *The Season Ahead*. The results from the second survey strengthened those from the first with an even stronger preference for 'self-learning' methods of obtaining information. This supports the view that graziers like to access relevant information at a time that best suits them rather than attending workshops, field days and conferences which can be time consuming and inconvenient. The increase in the number of graziers with access to the Internet also lends support to the idea that the Internet and email are fast becoming the most favoured ways of accessing climate information in western Queensland.

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