



# Improved use of seasonal forecasting to increase farmer profitability

Rural Industries Research and Development Corporation (AgriFutures Australia)

Activity: 14-01-010

Funding: \$2,350,000 (excluding GST)

This summary is an excerpt from the [final report](#), with minor edits made to ensure it meets departmental style and accessibility requirements.

## Summary

The success of agricultural industries relies on the weather which means being able to accurately predict the weather is crucial. The Improved use of seasonal forecasting to increase farmer profitability project through the Rural Research and Development for Profit program aimed to bridge the gap between seasonal climate forecasts (SCFs) and farm business decisions to improve productivity and profitability.

## Objectives and methodology

The objectives of this project were to:

- identify critical seasonal climate risks by sector, type of decision and region (Valuing the Forecast)
- identify and develop support tools, products, services, information and training to overcome the barriers to adoption of SCFs by farmers and advisers in farm business decisions (Using the Forecast)
- improve the SCF abilities of Australia's primary forecasting model ACCESS-S, by correcting biases that introduce errors into the current forecasts (ACCESS-S Model Enhancement).

These objectives were met through a range of activities that predominately related to stakeholder engagement and exploration of the barriers to adoption of SCFs, but also assessments of the models used for producing SCFs in Australia and addressing issues that limited the accuracy of the predictions.

## Outcomes and conclusions

There were a number of barriers to the adoption of SCFs by farmers and advisers in Australia, and they predominately related to perceived and real inaccuracies in the forecasts which leads to lack of trust in the SCFs and therefore, lack of adoption. Climate illiteracy was also a recurrent theme, and this lack of understanding of SCFs, and how and when to use them, notably impacted on whether SCFs were used, and if they were used, the efficacy of their application in farm business decisions. However, the forecast requirements requested by farmers in most regions can and would have been forecast by almost any SCF system currently used, however there was low awareness that the forecasts existed. The establishment of a community of practice (CoP) on the use of SCFs brought together farmers, advisers and key SCF support who discussed and

shared information, knowledge and opportunities for improving the use of SCFs. The success of the CoP is evident in its continuation post the conclusion of this project. A significant number of resources to support improved knowledge and application of SCFs by farmers and advisers were produced and utilised in forums beyond just the CoP, and predicted to have reached thousands of stakeholders.

While the overall skill level of SCF systems could be considered modest to reasonable, higher forecast skill levels are more obvious and accurate during El Niño and La Niña events (collectively known as ENSO periods), especially in many regions of southern and eastern Australia. Therefore, a range in forecast value was found within various case studies with the value primarily dependent on the environmental and economic settings of the decision and the skilfulness of the forecast.

Further, experiments to improve the forecasting ability of models currently used in Australia were successful in reducing long-standing issues and as a result, the models produced more realistic representations. These changes will require further development and testing.

### **Implications for industry/primary farmers**

Although all farmers are aware of climate risk, there is variability in the adoption of SCFs to manage that risk. Farmers are best to avoid forecasts during periods when the skill of the model is known to be low and seek them out during periods when they're known to be high, however farmers generally require assistance in making these assessments. The CoP and supporting materials that were developed as part of this project provided a significant opportunity for improving the adoption of SCFs in agricultural management, and there are plans to continue the CoP and utilisation of materials beyond the completion of this project. This project also improved engagement and communications between government departments, farmers, advisers and other stakeholders.

### **Recommendations for further research and improved adoption**

A number of recommendations for further research were identified in this project, and adoption of SCFs in farm business decisions will improve as more information and opportunities for knowledge sharing are explored, and those established as part of this project, continued. The Rural Research and Development for Profit program project 'Forewarned is Forearmed Extremes' project covers extremes in rainfall and temperature which accounted for the majority of issues raised by farmers and advisers during this project. Therefore, continuation of the CoP and maintenance of support materials developed in this project are recommended to be continued in-line with the 'Forewarned is Forearmed Extremes' project.

### **Collaborations**

The project was highly collaborative because of the diversity and number of formal project partnerships, the action learning research and engagement structure/methodology of the project and the focus on 'private sector extension'.

Led by Dairy Australia, the project was a collaboration involving nine partner organisations including six Research and Development Corporations (Dairy Australia, Meat & Livestock Australia, Cotton Research & Development Corporation, Sugar Research Australia, Australian Pork Limited, and Horticulture Innovation Australia), the Victorian and NSW governments, and the University of Melbourne. The private and public primary industries, research, development

and extension and advisory sectors collaborated strongly with the project in forums, surveys, and workshops. Private and public advisers were employed in the project in co-innovation roles.

The project was funded by the partners and the Australian Government's Department of Agriculture, Water and the Environment as part of the Australian Government's Rural Research and Development for Profit program.