Risk Attitude, Planting Conditions and the Value of Climate Forecasts to a Dryland Wheat Grower

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for the degree of Master of Economics
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by

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Declaration

I certify that the substance of this dissertation has not been already submitted for any degree and is not currently being submitted for any other degree.

I certify that, to the best of my knowledge, any help received in preparing this dissertation, and all sources used, have been acknowledged.

Graham Marshall

Date:

Abstract

Benefits of a climate forecasting system based on identification of phases of the Southern Oscillation were valued for a dryland wheat grower in the vicinity of Goondiwindi. In particular the sensitivity of this value to variation in risk attitude and planting conditions was examined.

Recursive stochastic programming was used to model the sequential decision process within which the climate forecasts would be utilised. The model was designed to identify the actions, including within-season tactical responses to climatic events, that would be chosen in the imminent season with and without use of the forecasts. Actions were identified in the event of each of the climate patterns over the period 1894-1991 recurring. The grower was assumed to apply the expected utility criterion in choosing among actions. The actions at planting time related to choices of nitrogen application rate and cultivar and, at either anthesis or grain maturity, to choices of proceeding with or abandoning each wheat activity.

The action sets identified were used to derive probability distributions for monetary outcomes with and without use of the forecasts. The value of the forecasting system was calculated as the maximum fee the grower could afford to pay for its use without utility being lowered relative to its non-use.

The estimated value of the forecasting system was positive in all of the 60 decision environments analysed except for three where it was zero. The estimated value varied considerably according to assumptions made regarding risk attitude and planting conditions. The mean value across the various sets of planting conditions analysed varied between $3.52 and $3.83 per hectare available for wheat growing, depending on the assumed risk attitude of the grower. Variation in risk attitude and planting conditions did not exhibit a consistent directional effect on the estimated value of the forecasting system.

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