Rice production in Australia

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Evapotranspiration forecasts were found to improve the profitability of rice production systems in Australia by between $0 and $120/ha by improving decisions around the timing of rice field drainage.

How can seasonal climate forecasts provide economic value to farming enterprises?

Seasonal climate variability is a key source of year on year variability in farm profitability. Seasonal climate forecasts provide opportunities for farmers to better match farm decisions with upcoming climatic conditions. These forecasts can provide economic value if they change management decisions to capitalise on opportunities in good seasons or minimise losses in poor seasons.

While seasonal climate forecasts help manage production risks associated with climate variability, they do not remove the impact of a particular climatic event. For example, a skilful forecast can reduce uncertainty about drought occurrence, but drought influences productivity and profitability however well farmers are able to anticipate it.

Rice production in Australia

An important decision for rice growers is when to drain rice fields in preparation for harvest. Rice producers aim to balance rice wholegrain percentage of their crops, which is a marker of quality and attracts a price premium, with water requirements and related costs. Evapotranspiration from late February to late May influences both wholegrain percentage and water requirements.

Draining earlier will reduce wholegrain percentage but with potentially lower water costs. Draining later will increase wholegrain percentage but with potentially higher water costs.

A skilful forecast of evapotranspiration may influence this decision due to the relationship between evapotranspiration and crop water requirements and wholegrain percentage.

Can evapotranspiration forecasts improve rice drainage decisions?

A case study rice enterprise located at Deniliquin in New South Wales was used to test how an evapotranspiration forecast could help rice growers make a decision about when to drain rice fields.

A wholegrain model was used to simulate wholegrain percentages for various drainage times, and the industry standard premium/discount was applied to value the wholegrain percentage. This information was combined with an estimate of water costs related to drainage time and results were assessed to capture the links between climatic conditions, water price and wholegrain percentage. A perfect forecast provided certainty about evapotranspiration, potentially allowing farmers to choose more profitable times to drain their fields.

Case study at a glance: **Rice**

Site: Deniliquin, New South Wales

Decision: Rice field drainage timing

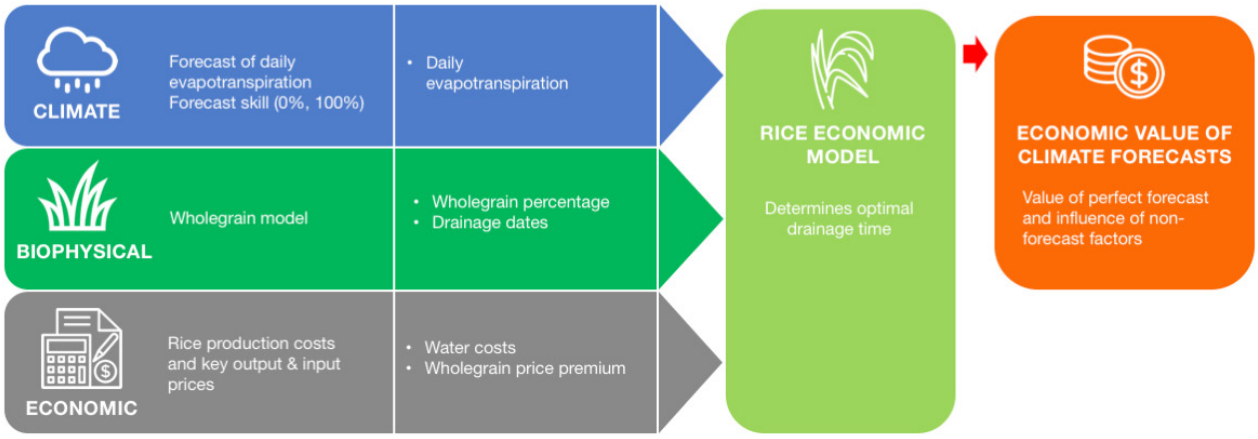
Decision time: 15 February–1 March

Trade-off: Drain early with lower wholegrain percentage and lower water costs or later with higher wholegrain percentage but with potentially higher water costs

Forecast: Daily evapotranspiration over the drainage period (15 February–31 May)

Other drivers: Temporary water price

Forecast value: $0–$120/ha



Inputs to the model used in this case study to assess the economic value of climate forecasts for rice production in Australia.

Key findings

Water prices had the biggest influence on the drainage time decision. When water prices were high, the optimal decision was to drain early with and without a forecast as the cost of water associated with delaying drainage outweighed the premium price obtained for a higher wholegrain percentage crop.

Conversely, with low water prices the with and without forecast decision tended towards draining later in the season. This choice attracted premiums associated with a higher wholegrain percentage at low water costs.

For medium water prices, a range of optimal drainage dates were obtained. At this water price point, forecast information was found valuable. In this instance, drainage time was modified based on forecast information to balance seasons with higher evapotranspiration rates (earlier drainage) and lower evapotranspiration rates (later drainage).

The decision setting that leads to trade-offs between expenses (water) and income (wholegrain percentage) provide the most scope for value.

When can seasonal climate forecasts have economic value?

For seasonal climate forecasts to have economic value:

- the climate for the months relevant to the decision must be historically variable, and that variability must translate into variable production and economic outcomes
- production (e.g. current soil moisture or standing pasture) and market (e.g. commodity prices or supplementary feed costs) conditions are at a point where decisions are sensitive to climate forecast information.
- the seasonal forecast must have sufficient skill and timeliness for the decision to be changed.

Important: The results for other sites, systems and decisions will differ from those in this case study. However, it is likely that the general findings around the circumstances for which forecast value was found will provide insights for the use and value of seasonal climate forecasts for rice producers more generally.

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