

# Beef production in southern Australia



Photo: NSW DPI

Seasonal climate forecasts were found to improve the profitability of beef production systems in southern Australia by between \$0 and \$28/ha by improving stocking rate decisions at key times.

## 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.



Photo: NSW DPI

## Beef production in southern Australia

The core production goal of beef operations in southern Australia is to convert feed into animal weight gain. Farmers aim to match the feed requirements of the herd to the availability and quality of feed, particularly pasture, to optimise beef production.

For a spring calving system, an important management decision is whether to sell animals as weaners in March or to hold these animals and sell them in November as steers and heifers. This decision is a trade-off between selling lighter animals in March with lower feed costs versus selling heavier animals later with potentially higher feed costs.

A skilful seasonal climate forecast may influence this decision due to the relationship between rainfall and pasture growth and therefore animal weight gain.

## Can seasonal climate forecasts improve beef production systems?

A case study beef enterprise located at Holbrook in New South Wales was used to test how a seasonal climate forecast could help farmers make a decision about how many weaners to

sell in March and how many to carry through winter to sell as yearlings in November.

A decision model chose between 11 stocking rate strategies (sell 0%, 10%, ..., 100% of weaners) with and without a forecast. Increasingly skilful climate forecasts provided greater levels of certainty about the occurrence of one of three climatic states (dry, average and wet), allowing farmers to choose more profitable stocking rates.

### Case study at a glance: Southern beef



**Site:** Holbrook, New South Wales

**Decision:** Stocking rate – how many weaners to sell

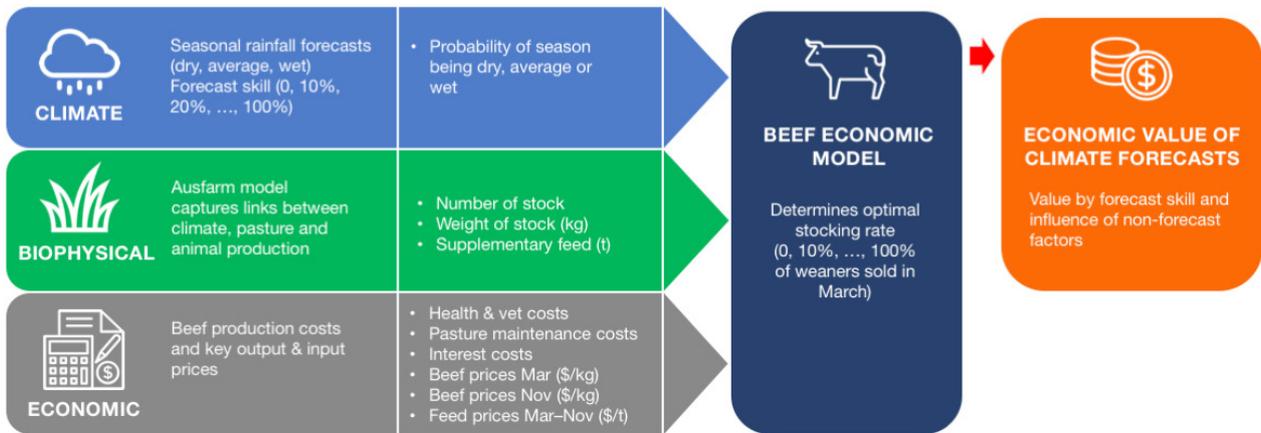
**Decision time:** March

**Trade-off:** Sell more weaners in March at lower weights or carry through to winter to higher weights but potentially with higher supplementary feed costs.

**Forecast:** Rainfall (March–May)

**Other drivers:** Initial pasture availability; weaner price in March; supplementary feed price

**Forecast value:** \$0–\$28/ha



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

## Key findings

Initial pasture availability in March was the major determinant of how many weaners to sell. Low pasture availability led to a decision to sell all weaners in March regardless of forecasts of expected rainfall due to low livestock growth rates and high supplementary feed costs.

Supplementary feed and weaner prices were also important determinants of forecast value. When weaner prices and supplementary feed prices were low, weaners were generally held, triggered by the prospect of low income from selling weaners versus higher income from retaining them. When weaner prices and supplementary feed prices were both high, there was a tendency to sell weaners in order to take advantage of high

income from weaners and avoid high supplementary feeding costs of taking animals to higher weights.

Seasonal climate forecasts were found to have value when initial pasture availability was average or high and forecasts were for dry or wet. The most valuable forecasts led to decisions that ran contrary to the direction of production conditions. For example, a dry forecast when initial pasture availability was high triggered greater sale of weaners, which was different to the without forecast decision.

While the value of seasonal climate forecasts increased as forecast skill improved, the relationship between skill and value was heavily influenced by production and market conditions.

## 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.

This fact sheet is a summary of the report: Darbyshire R., Crean J., Broadfoot K., Simpson M. and Cashen M. (2018). Valuing seasonal climate forecasts in Australian agriculture: Southern beef case study. New South Wales Department of Primary Industries.

**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 southern producers more generally.