Communicating Climate Change
Module 18
An initiative of the National Agriculture and Climate Change Action Plan
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Farm viability in a changing climate

One difficult and complex question that concerns many farmers is: will my farm be viable as the climate changes?

Climate change will cause confusion and stress for farmers and advisors. By understanding that the future involves many changes to the farm business, and that every farm is different, the outlook may become clearer. For example, if grain prices are high because of food shortages, farms can be viable despite lower grain yields and higher costs.

Here we look at a case study to see the potential impact of climate change on farm viability.

Impact on operating surplus – case study

This case study looks over a 12-year period at the effect on wheat yield/operating surplus under two climate scenarios:

- the actual climate
- a 'climate-changed' scenario where yields are reduced (as modelled by CSIRO).

Figure 1 shows the farm operating surplus per hectare under the two scenarios.

The graph shows that, under a climate change scenario,:

- operating surplus would be generally lower
- operating surplus would be significantly lower in low-rainfall years

A cooperative venture between
MANAGING CLIMATE VARIABILITY R&D PROGRAM
BCG shared solutions
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Department of Agriculture, Fisheries and Forestry
Bureau of Meteorology
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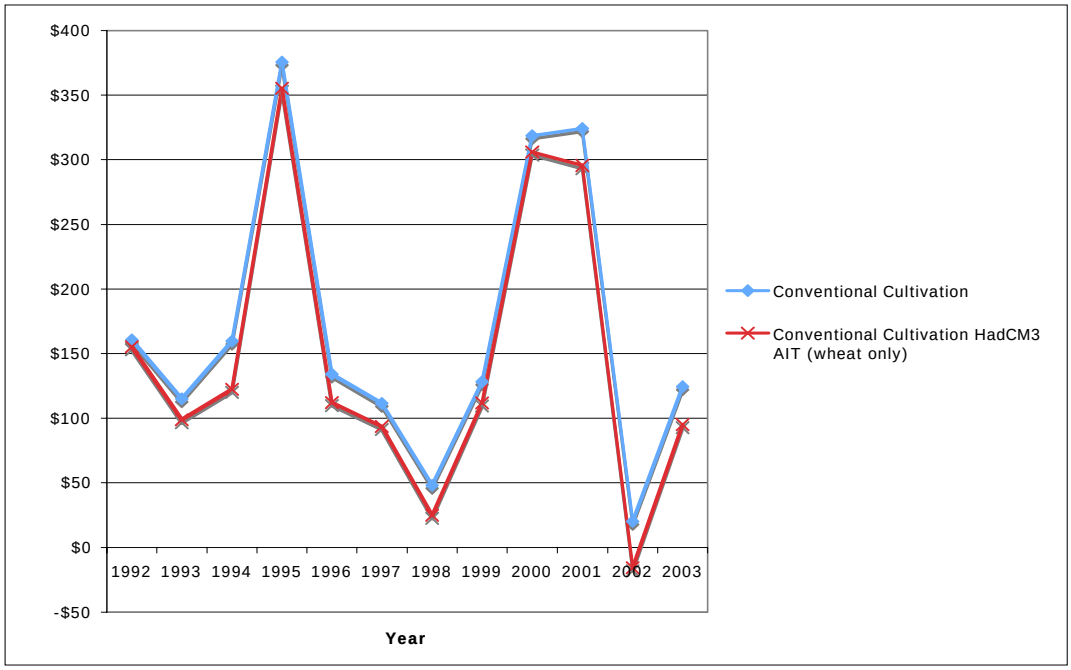

Figure 1: Case study – impact on operating surplus under a climate change scenario

Impact on operating surplus with adaptation – case study

When we look at the effect of adapting the farming system to increase the pasture area and reduce the wheat crop area (Figure 2), we find that, with increased pasture, the operating surplus is lower in good years and higher in bad years, under a climate change scenario.

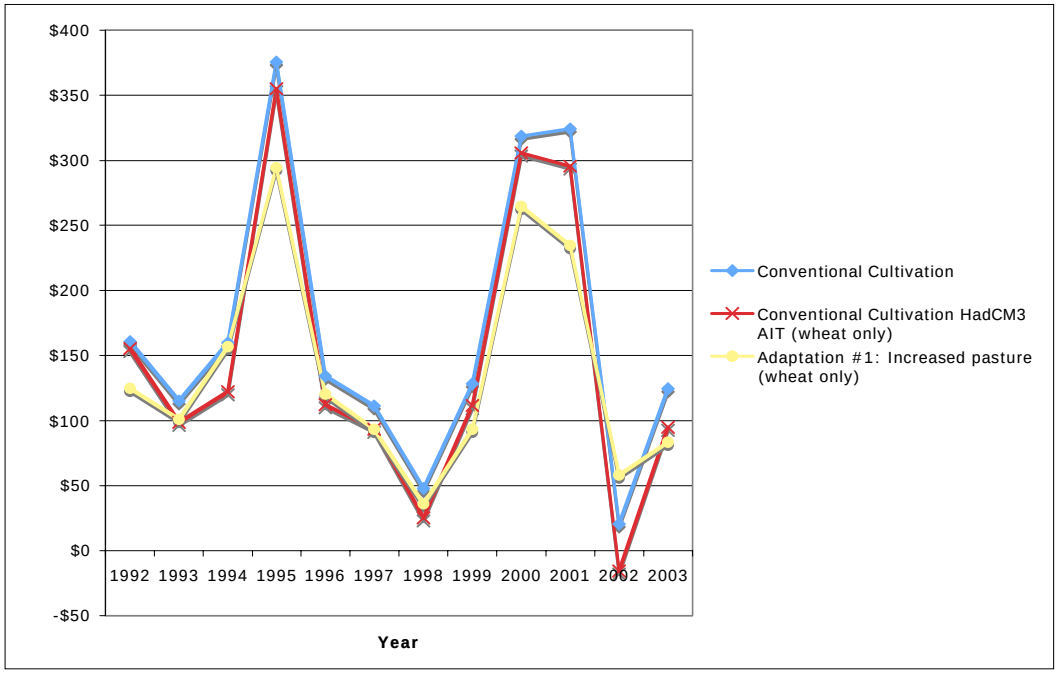

Figure 2: Case study – impact on operating surplus under a climate change scenario, with adaptation

Impact on net worth

In reality, many changes will occur due to climate change, affecting much more than wheat yield, such as:

- grain prices
- yields of other grains
- input costs

To help understand the effect of these changes as well as climate change, a simple model was created to show the effect on whole-of-farm profitability of multiple effects. The farm performance is expressed as the change in 'net worth'. The model can be used by farmers to approximate what might happen to their equity under a climate change scenario.

For the case study farm, the model was used to show the effect on net worth of:

- lower yields of all crops due to climate change
- higher costs
- higher grain prices

Figure 3 shows the net worth of the case study farm with and without climate change. We see that, on this farm, with climate change, net worth would still increase but at a slower rate.

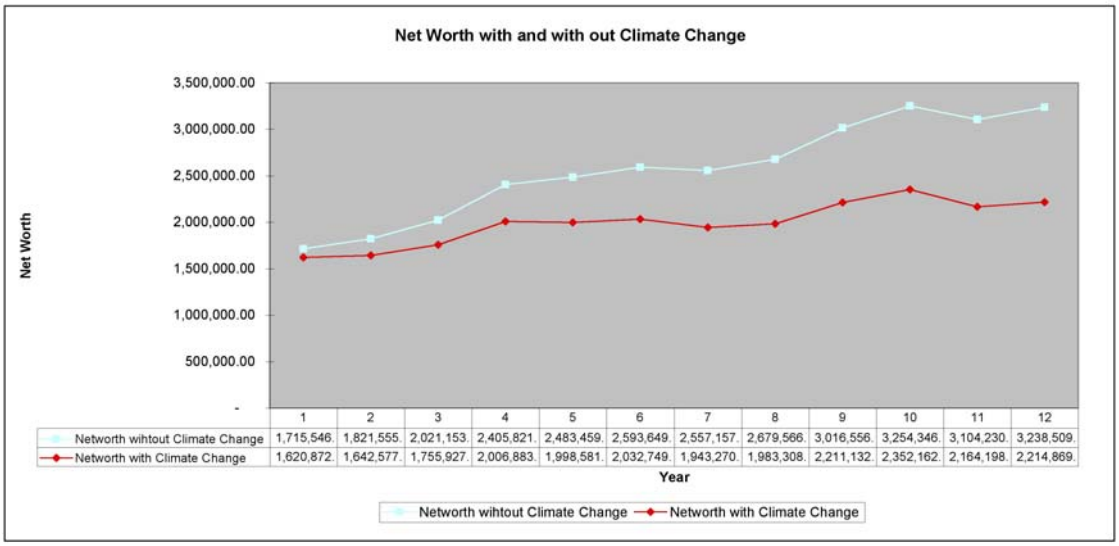

Figure 3: Case study – impact on net worth with and without climate change

Figure 4 shows the net worth of the case study farm with and without climate change when variable cropping costs are increased from $170 to $230 per hectare.

We see that with higher costs and climate change, net worth would decrease.

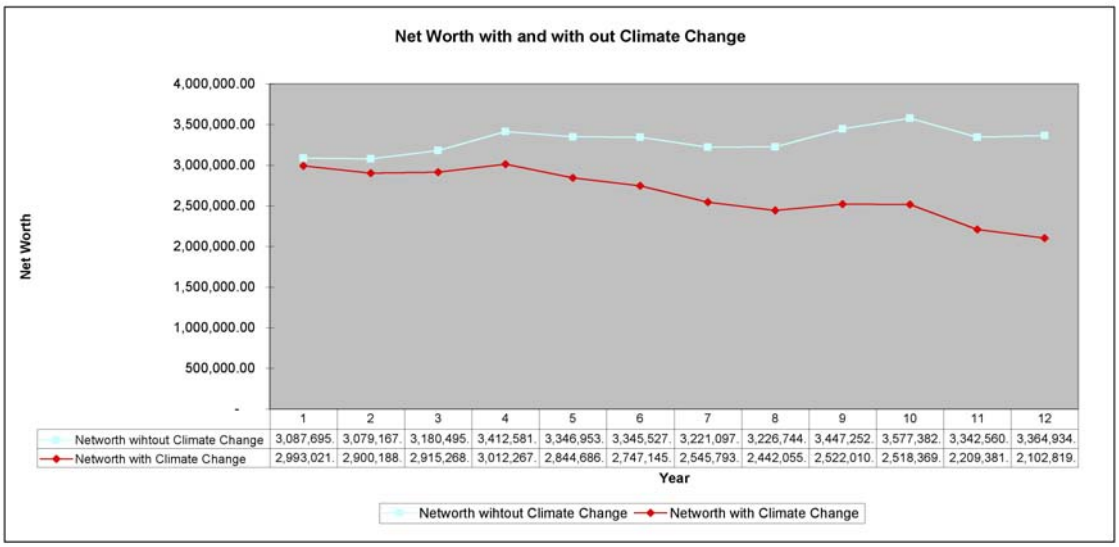

Figure 4: Case study – impact on net worth with and without climate change, with higher costs

Figure 5 shows the net worth on the case study farm with and without climate change when cropping variable costs are increased from $170 to $230 per hectare, and cereal grain prices are increased from around $200 to $300 per tonne.

We see that with higher costs, lower yields, and higher grain prices, net worth on the case study farm increases.

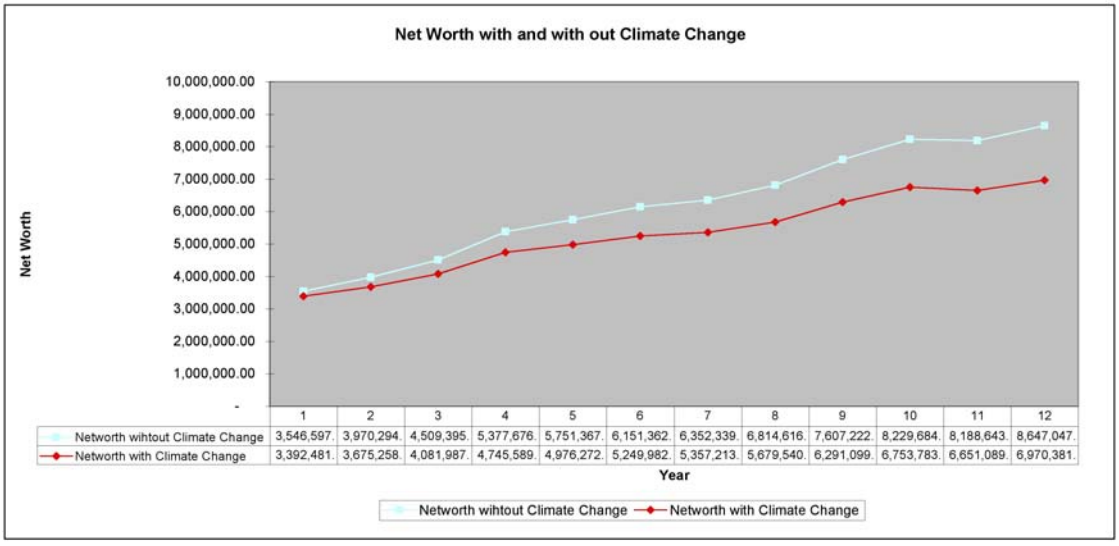

Figure 5: Case study – impact on net worth with and without climate change, with higher costs and higher grain price