Dairy Directions — Analysing Farm Systems for the Future

Providing robust analysis of the impact of on-farm changes and innovation on the profitability of dairy farm systems

Cost of growing fodder on an outblock in the irrigated region of northern Victoria

Background

Climate change, water buybacks and continuing water reform such as the Strategic Connections Program (formerly the Northern Victoria Irrigation Renewal Program), are likely to increase the number of properties that will shift from intensive irrigation to opportunistic irrigation.

Climate change in particular could reduce the proportion of grazed pasture in the diet, increasing the reliance on purchased supplements (concentrates and fodder), or the production of conserved fodder on outblocks.

This study investigated the cost of growing fodder on an outblock in northern Victoria under moderate and severe (run of dry years) climate scenarios. The crops grown were:

- Lucerne for hay (50%)
- Cereal for silage (20%)
- Maize for silage (10%)
- Annual pasture (ryegrass/shaftal-clover mix) for hay (20%).

A partial budget (discounted net cash flow) over 10 years was used to investigate the cost of purchasing an outblock to grow fodder. The two measures considered were variable costs per ha, which has cash flow and risk implications, and net cost of estimated metabolisable energy (ME) produced and conserved over the 10 years.

Data on costs for each crop were taken from the Northern Victoria Irrigated Cropping Gross Margins booklet (Department of Primary Industries Victoria 2009) and a range of expected ME yields was established for each of the irrigated crops based on work undertaken by Department of Primary Industries (2011) and Bell et al. (2011). It was assumed that in the case of a crop water shortfall due to low allocations, water was purchased on the temporary tradeable water market. Data from the Northern Region Sustainable Water Strategy (DSE 2008) was used to describe water reliability profiles under the two climates.

Results

Dry matter (DM) yield, ME (MJ/kg DM), and crop sensitivity to water use were key determinants of the cost of producing fodder and therefore profit. Average variable cost for each of the crops for the medium climate scenario is shown in Figure 1 (there was no change in the ranking under the severe climate scenario). High variable costs for some crops can lead to cash flow problems and therefore have risk implications which should be considered.

The economic ranking of crops changes considerably when ME yields are considered. Growing and conserving lucerne is likely to provide a cheaper alternative compared to purchasing lucerne hay whilst the opposite seems to be true for pasture hay. Under a drier climate, lucerne appears to be cheaper than other forage crops due to a smaller reduction in DM yield. The net cost per MJ for maize silage and annual pasture hay is more variable (greater standard deviation) due to the wider range in estimated ME yields under the severe (run of dry years) climate scenario and increased water requirement (Figure 2).

Cereals perform better under drier conditions as ME yields are maintained compared to other crops, and cereals have a relatively lower water cost component as a percentage of total cost. Water use rises under drier conditions to maintain production.

When assessed across the entire 10-year analysis period for all crops under a moderate climate scenario, the total cost of ME was less than $0.025/MJ kg DM in 95% of years. If DM yields were assumed to decline with ME yields under a drier climate scenario, then the number of years where cost was less than $0.025/MJ kg DM significantly decreased, to 0% (Figure 3). This is due to the combined effect of reduced DM yields, decreased ME yield and higher costs under the drier climate situation. It highlights the importance of management expertise under drier climates to minimise DM yield reductions.

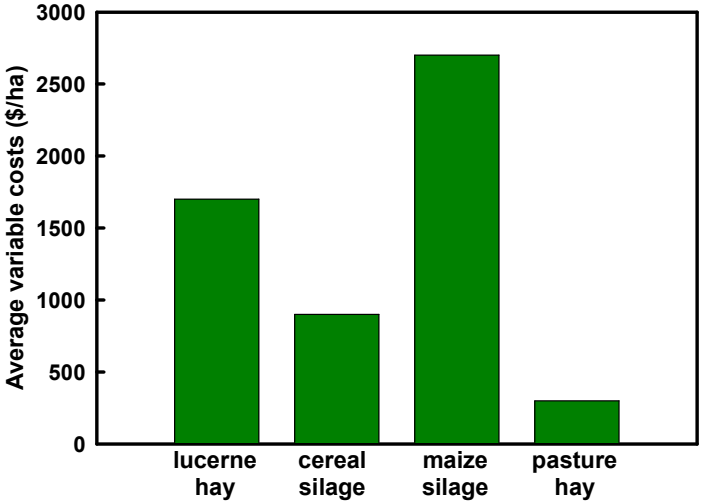

Figure 1. Average variable cost per ha for lucerne hay, cereal silage, maize silage and annual pasture hay production under the medium climate scenario.

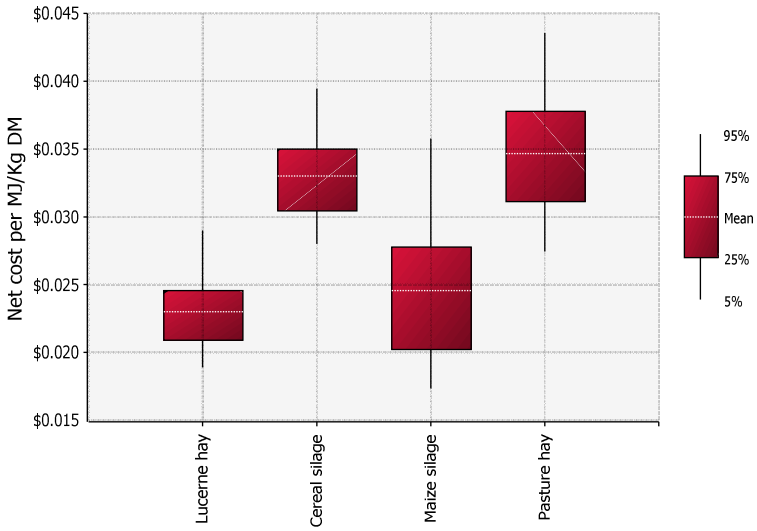

Figure 2. Net cost per MJ/kg DM for lucerne hay, cereal silage, maize silage and pasture hay under the severe (run of dry years) climate scenario.

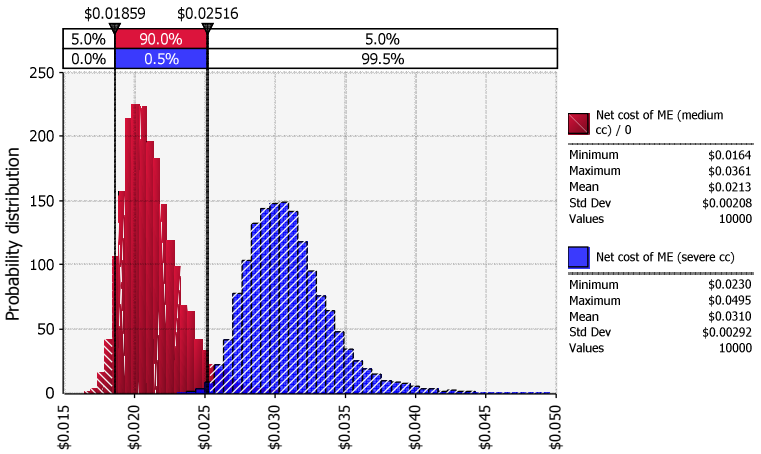

Figure 3. Net cost per MJ/kg DM under a moderate climate scenario (red distribution) and minimum yields under drier climate scenario (blue) where DM yields reduce.

In summary

This research has improved the understanding of the costs of growing a range of irrigated fodder crops under varying climatic conditions in northern Victoria. Because the market for feed is well informed and is a close substitute for irrigation water, it would not be reasonable to assume that growing feed is always better than purchasing feed. A properly functioning market should adequately reflect the cost of growing feed in a given year, as it factors in the price of inputs such as water. However, home-grown feed has a number of benefits including lower transaction and transport costs. These benefits may place some farmers who can consistently produce quality feed at a competitive advantage.

Growing, compared with purchasing fodder, can provide greater certainty in regard to quality and result in a cheaper feed source. However, by choosing to grow fodder, farmers are more exposed to climate variability albeit this can be reduced by the type of crop grown (i.e. more cereals).

It is also important to note that this analysis has not accounted for tactical or operational actions that a farm manager can take to improve profitability of the enterprise in a year with either poor/good prices or seasonal conditions.

References

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