

DECIDE AND THRIVE

Merino producers in
Southern Australia
#1 of 3

Decide and Thrive helps producers and consultants determine which breeders to cull during drought.

Problem

When managing for drought, producers are faced with decisions about:

- when and how many animals to sell; and
- if selling breeders, which attributes are best to use for culling decisions.

Decide and Thrive addresses the question of which breeders to cull.

Approach

Modelling was supported by commercial data to tackle the scenario of a severe drought where 50% of the flock needs to be culled to meet forage supply.

Step 1: sell dry and cast for age ewes; 10% of hogget ewes on physical confirmation.

Step 2: sell breeders mid-pregnancy based on either: lower body condition score, lower mature weight, greater age, or at random.

Step 3: rebuild the flock by retaining hogget ewes and culling breeders at an older age.

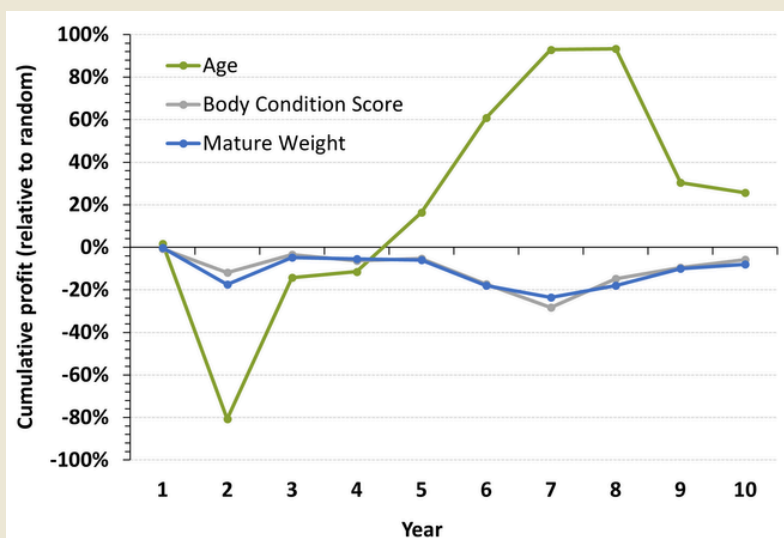


Fig 1: Cumulative profitability over a 10-year period (relative to random) from using body condition score, mature weight, or age.

Other factors known by producers and consultants are useful in determining which breeders to cull in response to severe drought and can be used in conjunction with these findings.

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Analysis

- Hundreds of simulations of the model using a 10-year period with the chance of good and dry years based on historic climate.
- Variable and overhead costs based on industry data.
- Prices for inputs and outputs adjusted for drought and inflation.
- Wethers sold at one year of age, ewes first lamb at two years of age, weaning rate (100%) and mortality (5% p.a. for ewes).
- Culling occurs in the first year and feeding when required thereafter.
- Estimate profitability from wool, live weight and price for ewes, hoggets and lambs sold and supplement fed.

Key findings

- The most profitable outcome was achieved using age to cull older breeders in response to drought.
- Under the modelling scenario, producers using age would be about \$85/hectare better off over a 10-year period, mostly due to benefits of more quickly rebuilding the breeding flock.
- Relative changes in the value of livestock inventory account for the dip (years 2-4) in relative cumulative profitability from using age as the basis for culling.
- Profit relative to random culling varies from year to year but producers would be better off approximately 70% of the time by using age as the basis for culling.

DECIDE AND THRIVE

Merino producers in
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#2 of 3

Decide and Thrive helps producers and consultants decide which breeders to cull during drought.

Which breeders to cull in drought?

- The first Fact Sheet (#1) in this series identified that age was the most profitable approach for culling breeders in response to drought.
- This Fact Sheet (#2) describes the likely changes you can expect in the flock over time from culling of breeders in response to drought.

Approach to culling

- The modelling tackled a scenario of a severe drought where 50% of the flock was culled to meet forage supply. See Fact Sheet #1 for details about the modelling.

Key findings

- Culling older breeders in response to drought resulted in more ewes becoming available for mating (relative to the other culling options) because there was no need to cull ewes as cast for age for several years.
- Culling the lowest body condition score breeders led to an average flock with an initial advantage of 0.4 units condition score and 1.1 kg mature weight compared to culling at random. By Year 10, the advantage was 0.1 units condition score, 0.2 kg mature weight.
- Culling the breeders with the lowest mature weights led to an average flock with an initial advantage of 0.1 units condition score and 5.7 kg mature weight compared to culling at random. By Year 10, the advantage was 0.0 units condition score and 1.2 kg mature weight.
- The initial increases in condition score and mature weight are a direct response to breeder culling and correlations among traits. The following decline in the initial improvement comes from little selection on replacement hoggets because most needed to be kept to rebuild the flock.

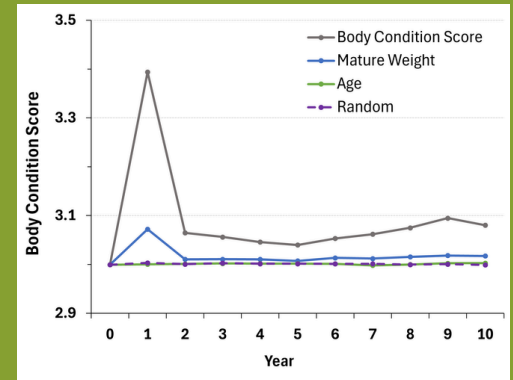


Fig 1: Response in body condition score from using different traits for the culling of breeders in response to drought in Year 1.



Fig 2: Response in mature weight from using different traits for the culling of breeders in response to drought in Year 1.

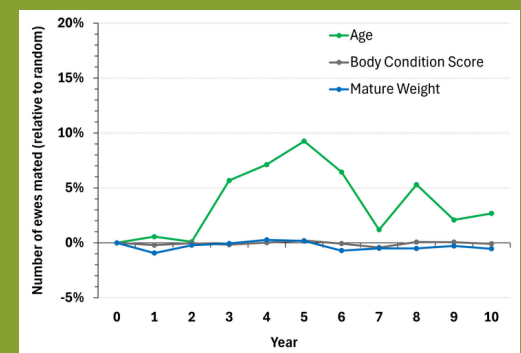


Fig 3: Number of ewes mated (relative to random) from using different traits for the culling of breeders in response to drought in Year 1.

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DECIDE AND THRIVE

Merino producers
Selling or feeding in
response to drought
#3 of 3

Decide and Thrive helps producers and consultants decide which breeders to cull during drought.

Introduction

Decisions about selling or feeding breeders when managing drought are complex and should be part of an overall management plan that also includes amongst a range of subjects:

- Restocking—so stocking rate matches carrying capacity, feed and financial budgets at the earliest possibility.
- Biosecurity—risks associated with purchased feeds and livestock.
- Feeding and water infrastructure and labour availability.

Selling or feeding case study

Using the modelling described in Fact Sheet #1, the financial consequences from selling or feeding breeders were explored for three options:

1. Not selling breeders and feeding in response to drought.
2. Culling 50% of breeders in response to drought, feeding the remaining livestock, and rebuilding the flock over time through retention of hoggets and keeping ewes to an older age.
3. Culling 50% of breeders in response to drought, feeding the remaining livestock, and buying back-in (may refer to the most appropriate enterprise, e.g. breeders, trade stock, agistment, cropping, etc) at the earliest possibility, depending on feed and financial budgets.

In the Case Study, the annual stocking rate was 13 Dry Sheep Equivalent (DSE)/ha. Prices for livestock and feed, and overhead costs are from industry sources but these may differ from your situation[#].

Take home messages

In this Case Study, when breeders were sold in response to drought, restoring the livestock inventory so that stocking rate matched carrying capacity, feed and financial budgets at the earliest possibility was more profitable than rebuilding the flock through breeding, or not selling and feeding.

Overall management plans for drought are complex and need to include, amongst a range of subjects, decision processes about:

- selling or feeding breeders in response to drought,
- restocking, so stocking rate matches carrying capacity, feed and financial budgets at the earliest possibility. In some situations, other enterprises, e.g. agistment, cropping, etc may be an alternative,
- biosecurity risks associated with purchased feeds and livestock,
- feeding and water infrastructure and labour availability.

- The first Fact Sheet (#1) in this series identifies the most profitable approaches for culling breeders in response to drought.
- The second Fact Sheet (#2) describes the likely changes in flocks.
- This Fact Sheet (#3) identifies key points to consider when deciding whether to sell or feed breeders in response to drought.

Meat and Livestock Australia, Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES), Australian Wool Exchange, Jumbuck Agriculture, The Australian Beef Report - Bush Agribusiness PTY LTD, Livestock Farm Monitor Project - Agriculture Victoria.

In brief, nominal prices in the Case Study during and following drought were respectively:

- \$3.52 and \$4.28 (\$/kg cwt) for ewes,
- \$359 and \$312/tonne for barley.

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Australian Government
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Key findings

The major points to consider in the decision of whether to sell or feed breeders in response to drought are:

Gross income and costs

- Selling breeders increased gross income (Fig 1) and reduced costs (Fig 2) in Year 1, but flock rebuilding was typically slow. This resulted in lower gross income in the following years.
- Feeding breeders increased costs (Fig 2). In this Case Study, feeding increased costs by about \$700/ha in the year of drought. But a larger flock size resulted in higher gross income in the following years than the option of selling and rebreeding.
- Selling breeders and then buying back-in, avoided the cost of feeding but shifted the cost increase, from stock purchases to the year after drought. In this Case Study, the cost of buying back-in was covered by sales in response to drought and a lower feeding cost.
- Selling livestock led to an increase in the overhead cost per head, because those overhead costs were fixed regardless of changes in livestock number.

Livestock inventory

- Selling livestock reduced the value of the livestock inventory (Fig 3), and delays in restoring the livestock inventory, so that stocking rate matches carrying capacity, feed and financial budgets at the earliest possibility, will have a negative impact on profitability.

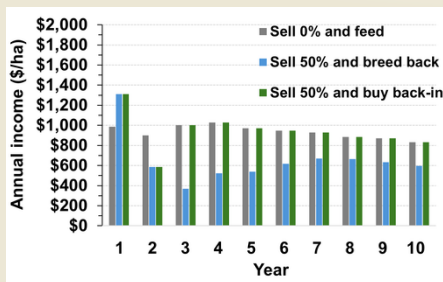


Fig 1: Annual gross income from: not selling breeders and feeding in response to drought, or selling 50% of breeders and breeding back, or selling 50% of breeders and buying back in Year 2.

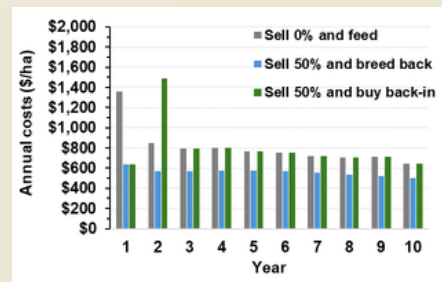


Fig 2: Annual costs (variable + overhead) from: not selling breeders and feeding in response to drought, or selling 50% of breeders and breeding back, or selling 50% of breeders and buying back in Year 2.

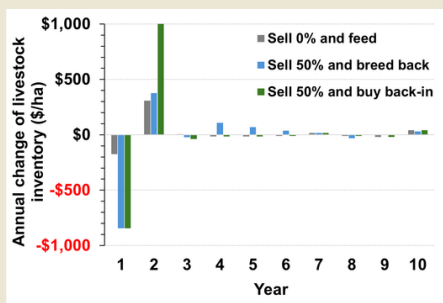


Fig 3: Annual change in the value of livestock inventory from: not selling breeders and feeding in response to drought, or selling 50% of breeders and breeding back, or selling 50% of breeders and buying back in Year 2.

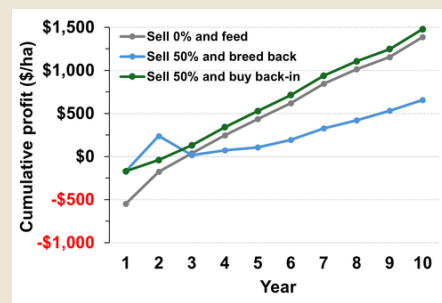


Fig 4: Cumulative profit (before interest and tax) from: not selling breeders and feeding in response to drought, or selling 50% of breeders and breeding back, or selling 50% of breeders and buying back in Year 2.

Profitability

- In the short-term, profit was better for the option of selling and breeding back, but this changed from Year 3, because a smaller flock from breeding back meant less income, higher overhead costs per head, and therefore less profit.
- The option of not selling and feeding breeders, became more profitable than selling and breeding back, from Year 3, but required the capacity of the business to finance the increased costs due to feeding during drought.
- Selling breeders and buying back-in, was the most profitable option because it avoided the costs of feeding and rebuilt the herd in Year 2 through stock purchases.

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