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New wool prices beg higher stocking rates

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In the past few years, increases in wool prices have varied, depending on fibre diameters. In 1987-88, fine wools (19 micron) were selling for as much as twice the price paid for coarse wools (26-27 micron).

A wool producer can alter the fibre diameter of the wool produced through breeding and by management.

This article discusses the effect of changing stocking rate on wool production, using WOOLMODEL to do the calculations (Curtis, 1986, 1988). WOOLMODEL can also be used to examine the effect of changes in phosphorus application rates.

Relationship between wool quality and quantity

Research has shown that a change in fibre diameter of one micron induced by altering stocking rates was associated with a change in clean fleece weight of 0.55 kg (White and McConkie, 1976; Curtis, unpublished data). This relationship has been used to estimate the effect that a change in fibre diameter will have on wool returns.

To use WOOLMODEL, a producer must first define the average fleece weight, fibre diameter and yield for the flock. These data provide the basic level of production. Deviations from this average fleece weight are then used to predict changes in fibre diameters, which for this analysis are influenced by the changes in stocking rates that the producer is testing.

The value of the wool, and thus the profitability of the stocking rate, are calculated from the predicted clean fleece weights and fibre diameter.

Assumptions

Several important assumptions are incorporated into WOOLMODEL. While they do not invalidate the model, they must be seen as constraining the way in which the results can be interpreted.

- WOOLMODEL considers wethers only. The model's functions were developed from trials with adult wethers grazing pastures in southwestern Western Australia.
- The pasture considered is a legume-based (at least 25 per cent legume) annual pasture and no attempt is made to predict changes in pasture composition. Seasonality of pasture production is not considered, though this is recognized as an important consideration when phosphorus fertilizer application rates are assessed.
- Supplementary feeding is not considered and neither is the availability of stubbles.

The big variation in wool prices has altered the management strategy farmers should use for selecting stocking rates.

- Changes in sheep liveweight and thus the changes in stock value are not considered. Related matters including risk in poor seasons, increased incidence of disease and the effect on options for selling sheep need to be evaluated when contemplating stocking rates higher than usual.
- A sudden or drastic change in nutrition could lead to a break in the wool. WOOLMODEL does not consider this potential problem.
- High stocking rates will increase the risk of soil erosion and compaction on some soil types.
Example

WOOLMODEL was used to predict profitability for a wether flock under the following conditions:
- 600 mm annual rainfall,
- gravelly soil,
- 270 kg of superphosphate per hectare, and
- current soil test of 10 ppm of phosphorus.

Figure 1 shows the predicted amount of wool produced per hectare and the predicted fibre diameter plotted against stocking rate. This graph demonstrates the typical response in productivity to increasing stocking rate where an optimum is reached, and then production drops. Fibre diameter decreases as stocking rate increases.

Two main wool price scenarios should be considered when predicting profits. They are the Australian Wool Corporation’s reserve prices, and the producer’s expected prices. Producers can use the most recent prices paid at auction as an objective guide for wool prices.

The examples calculated in this article use the Australian Wool Corporation’s reserve prices for 1987-88 and the average closing quotations for the same period. In addition, uniform prices across fibre diameters have been included in the example at levels equivalent to the average reserve price and the average of the closing quotation, $7.00 and $10.00 respectively.

Figure 2 shows the gross margin, calculated using four prices, for wool plotted against increasing stocking rate.

There are two important points to note in these examples.

Irrespective of whether last year’s prices or the Australian Wool Corporation’s reserve prices are used, high stocking rates are more profitable because of the major effect of fibre diameter on wool price. Although unrealistic, the analysis indicated that, given the 1987-88 average wool prices, profit increased with increasing stocking rate until the paddock was so heavily stocked that sheep would lose condition and die.

At stocking rates below the optimum, and where uniform wool prices for all fibre diameters have been used, there is a false expectation of higher returns. Above the optimum stocking rate, profit is less than was predicted by the model.

Summary

The big variation in wool prices according to fibre diameter has altered the management strategy farmers should use for selecting stocking rates. High stocking rates produce fine wool, and thus increased profit.

Running more sheep per hectare than usual, with each sheep producing less wool, but wool of finer diameter, will increase income.

Stocking paddocks below the optimum rate, that is, using conservative stocking rates, will lower profit considerably because of the price penalty incurred for a coarse wool and the reduced wool production.

Wool growers must choose high stocking rates with care because of the greater risk of this strategy. Poor seasons will result in sheep needing more supplementary feed. Producers will need to adjust their sheep management to allow for the poorer condition of sheep run at high stocking rates.

Calculating a farm’s optimum stocking rate

WOOLMODEL is easy to use. Farmers who want to assess the benefits of changing the stocking rate on their property should contact their Department of Agriculture district office.

References