# Liceman – A decision making computer program

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**Summary**
*In 1993, Dr George Downing[a] and Sam Walker[b] created a decision support spreadsheet model to assist producers in determining the most cost effective management practice when faced with lice in sheep with greater than four months wool growth.*

*The program was never validated and in the intervening period a number of significant developments have occurred. New products, product withdrawals and the released for public comment in June of the draft National Registration Authority (NRA) 'Review of Selected Sheep Ectoparaciticidies' will have ramifications particularly in the area of occupational health and safety (OH&S).*

*Dr Bruce Farquharson[c] (1998) conducted a review of the program and concluded that it had potential but would need a considerable rewrite to be of practical value. He listed a number of desirable changes that are currently being costed with a view to progressing the program to a useable stage.*

*This paper consists of a precis of Dr Downing's (1993) paper on "Liceman" and Dr Farquharson's (1998) review.*

**Keywords**
Sheep lice, model, Liceman

## Introduction

Consultants and producers are often confronted with a multitude of options when dealing with lice in sheep some months post shearing.

At the time the program was written, field resistance, wool, meat and rehandling periods (OH&S) and general residue considerations were not as prominent as they are today. Also new chemicals are available and some have been withdrawn.

The program was developed using Microsoft Excel and runs as a series of work sheets on the various treatments available, ie. backline treatments for both long and short wool, handjetting and dipping. It calculates the effect of premature shearing and using appropriate wool values, the discounts associated with fleece derangement. There is a cashflow sheet tracing the impact of a decision over the year.

The program's objective is to allow a consultant, producer or distributor to feed in a number of variables and test the impact of each.

### *Description of the Model*

The model is made up of a number of modules as shown in Figure 1. Depending on the individual farm situation, some or all of the information modules come into play. The operator enters specific, relevant data and a strategy for the circumstances on that farm.

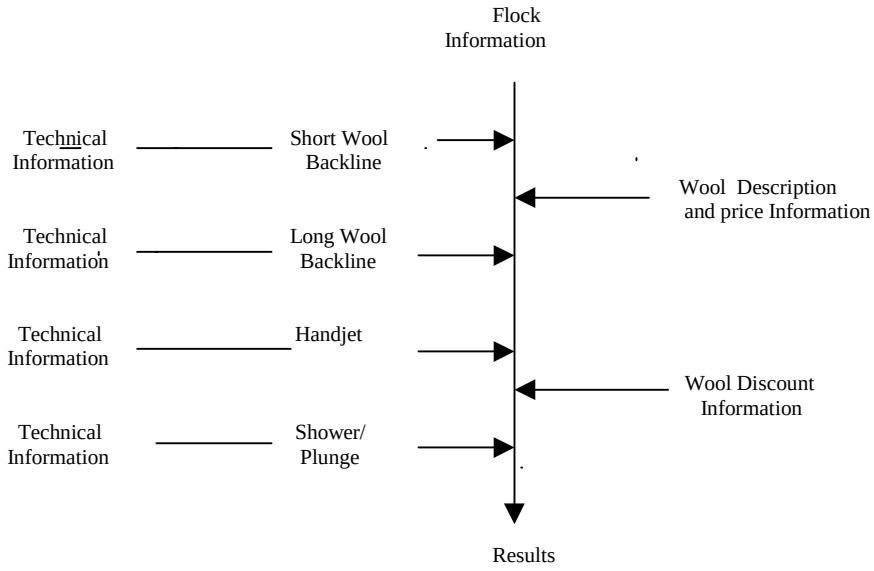


**Figure 1. Information flow in Liceman.**

## The Modules

### *Short Wool Backline Module*

This module calculates the treatment cost per head to allow a direct comparison between available products. The inputs are, cost per litre of product, dose rate according to weight and labour cost if additional labour is employed for carrying out the treatment.

### *Long Wool Backline Module*

Required input data is on products available at the time. It includes cost per litre and dose rate for each month of wool growth after shearing, and labour. This allows the price per head to be calculated according to the month of treatment.

### *Shower and Plunge dipping Module*

Information required to run this module is products available, price and dilution rate, quantity expected to be taken out by the sheep, one and two months after shearing and any labour costs. Dipping later than two months is to be discouraged.

### *Hand Jetting Module*

Information is required for available chemicals, price per litre (reconciling economies of scale and quantity required), dilution rate, volume of diluted chemical applied at each month after shearing.

### *Wool Description and Price Module*

The proportions of fleece wool, bellies, pieces and locks are entered with their clean fleece prices and yields, with selling costs removed. This figure is then transported to the 'Wool Discount' and 'Results' modules.

### *Wool Discount Module (Growth and management)*

This module allows the true cost of premature shearing to be brought in as an option. It requires estimates of the percentage of growth in the period prior to normal shearing. This is not an easy estimate. In a perfectly uniform feed year with non lambing animals, wool growth per month is 8.3%. However the range can be from 3% for lambing ewes losing weight, to 13% when sheep are rapidly putting on weight.

Wool length particularly, and yield can be affected to the degree of severe discounts (under or over length) by altered shearing. Also it may happen that two shearings can occur in the one financial year.

***Results Module***
This module brings together the various long wool treatments and management options for economic comparisons.

As most lice infestations create varying percentages of derangement in the flock the Results module provides a sensitivity analysis of this effect.

The sensitivity analysis looks at varying the discounts for reduced fleece weight, colour and cots for medium and heavy derangement. Light derangement is not considered to cause significant loss.

***Review Recommendations***
Dr Bruce Farquharson (1998), Ed Joshua[d] (2001) and others have contributed the following criticisms and suggestions.

***Treatments***
- Much of the material is out of date - prices change, products are withdrawn, new products available.
- Date of last update of time sensitive data should be obvious.
- Products listed by trade name – could be a complication if some are missed.
- Needs to include withholding periods for both wool and meat.
- Some work is needed on input data, labour, operation time.
- Weight of animal for calculating dose rate, should be heaviest, not average.
- Cost of treatment should include labour.

***Wool Price Information***
- Need access to Internet for prices and discounts.

***Wool Growth and Management***
- Cost of treating sheep off shears following premature shearing needs to be included.

***Results***
- Sensitivity analysis is difficult to follow and needs improved presentation.

***General***
- The program needs to comply with current computer practice.
- Use of Internet for updates on wool prices essential, chemicals and chemical costs desirable.
- As emphasis is now on reduced chemical use, the “do nothing” option needs further development.
- There needs to be a trigger to override an economic outcome when it conflicts with a WHO.
- Residue issues have proved a major impediment to the publication of the Chemical Usage Brochure and may limit effectiveness of Liceman.

## Conclusion

The program as designed, is a good base for making decisions and when modified, could be a valuable tool for producers particularly if residue issues are incorporated.

This conference is asked to consider the concept of Liceman, and decide if such a model is needed by industry. Given the stage of development, detailed costing to bring Liceman to the stage where it can be operated by a Consultant or Merchandising person, will be presented at the Conference but could be $10,000. To develop it to a user friendly and safe stage for producers may cost $25,000.

## References

Downing GM (1993) Lousy Sheep – What is the Most Cost Effective Management Alternative. *Australian Sheep Veterinary Society AVA Conference Proceedings 128 – 130.*

Farquharson B. (1998) *pers comm.*

Joshua E. (2001) *pers comm.*

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