

BETTER LOG-MAKING

A Report by A. Twaddle, Forest Research Institute, Rotorua

INTRODUCTION

Logging crews rarely achieve maximum value when making logs. One reason for this shortfall is that harvesting management is traditionally poor at providing crews with log manufacturing aids. Such aids would help crews to correctly identify the many different grades of logs in a standing tree (from high-quality clearwood to low-value pulpwood) and to consistently make the best decisions about the log mix from each stem. A small increase in average value recovery by the crew, while processing the same volume, can significantly increase return to the forest grower, as this hypothetical example shows :

Average log value	\$50/m ³	
Average daily crew production	200 m ³	
No. of days worked per year	235	
Average value recovery	85%	93%
Total annual value	\$1,997,500	\$2,185,500
Value difference		\$188,000

Measurements have shown that an "average" level of value recovery is about 85% of total value recovery. It should be possible, with greater input from harvesting management, to raise this percentage to the 93-95% range.

Obviously, the difference in revenue resulting from an average and from a high level of value recovery can be many times a crew member's wages over a given period. If a higher level of value recovery can be consistently obtained, even if some additional costs are incurred, the net revenue is likely to be increased.

It is a particularly appropriate time to look at the problem of whether the benefits of increased value recovery can outweigh the

costs incurred by providing decision aids to logging crews. Over the next five years harvesting will move into stands which have received more intensive silvicultural treatment than those previously harvested. For managers to gain a return on this silvicultural investment, logging crews will have to maximise value recovery.

MANUFACTURING AIDS

A few basic aids should be readily available to the logging crews to assist in log manufacturing. Individually these aids may appear unimportant but, collectively, they can have a marked effect on the level of value recovery.

(a) Logger's Tape

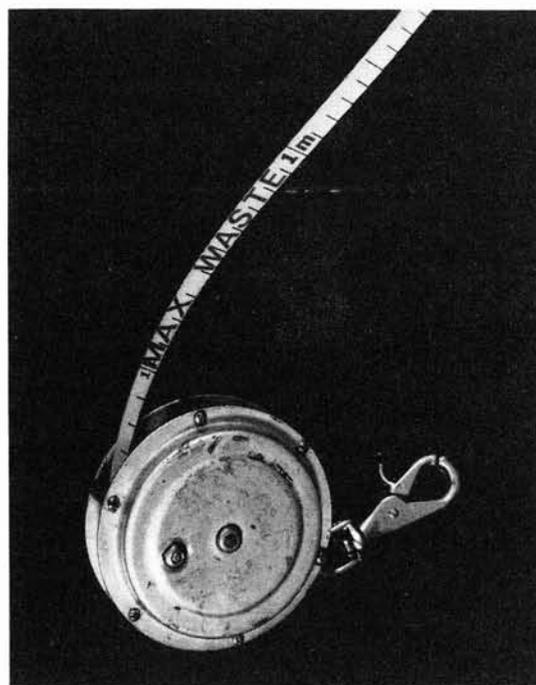


Figure 1 - Standard tape with cutting instructions added

There are no substitutes for the standard spring-loaded logger's tapes to measure length. Other length measuring devices commonly used, particularly poles, lack the flexibility of a lineal tape, and will normally lead to reductions in accuracy.

However, the standard logger's tape can be improved by highlighting desired cut points on the tape with coloured marks. Paint, insulation tape, or preferably vinyl adhesive tape can be used for this purpose.

It is also possible to have the preferred cutting options marked on the tape (see Figure 1). In this way management's needs regarding the appropriate log mix are always obvious.

(b) **Calipers**

If log calipers are not used, small end diameters, branch sizes, and out-of-roundness are usually estimated by eye, with a resulting loss in accuracy. Calipers do tend to be awkward to handle, and logging crews sometimes object to their use. However, this objection can be overcome if log-makers are not subjected to excessive production pressure or if log measuring and marking is done by a pair of skidworkers rather than by an individual.

(c) **Instruction Cards**

Harvesting management often provides a set of specifications for the log sorts to be segregated. However,

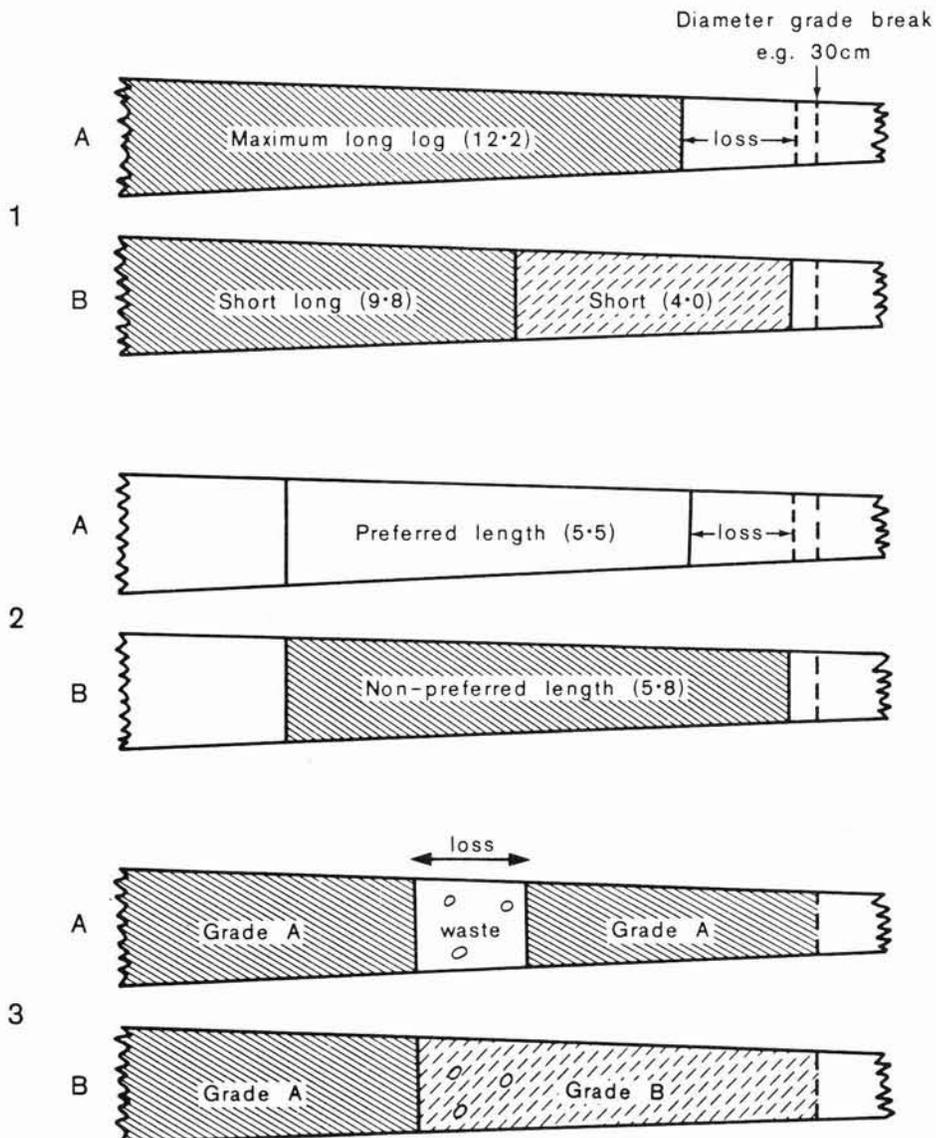


Figure 2 - Which is the best cutting option , A or B?

management seldom provides "rules of thumb" that enable the log-maker to decide either;

- how much lower grade material can (or should be) wasted to get a higher valued log, or
- when to cut preferred lengths over non-preferred lengths (see Figure 2).

Calculation of these rules may be difficult but if it is not attempted in the office, the skidworker cannot be expected to carry out the same calculations in the bush. These calculations should be made before the harvesting of a stand begins, with the aid of inventory information produced from systems such as MARVL.

BEST SHORT LOG OPTIONS				
SECTION LENGTH				
7.1	4.0+3.1, 3.7+3.4			
7.4	4.3+3.1, 4.0+3.4, 3.7+3.7			
<hr/>				
	Preferred lengths	4.9	5.5	6.1
		<hr/>		
7.7	2.8			
8.0	3.1			
8.3	3.4	2.8		
8.6	3.7	3.1		
8.9	4.0	3.4	2.8	
9.2	4.3	3.7	3.1	
9.5	4.6	4.0	3.4	
9.8	4.9	4.3	3.7	
10.1		4.6	4.0	
10.4		4.9	4.3	
10.7		5.2	4.6	
11.0		5.5	4.9	
11.3			5.2	
11.6			5.5	
11.9			5.8	
12.2			6.1	

Figure 3 - Instruction card with preferred cutting options for short logs. The card is an aid to help crews judge where it is best to make their cuts. For example, if the length of the stem from the previous cut position to the diameter grade break is 10.1 metres, skidworkers have four options (5.5 + 4.6, 6.1 + 4.0, 4.6 + 5.5, 4.0 + 6.1) from which to choose the best combination to allow for any quality changes.

Summarised instructions can be typed on to 8 x 12 cm cards which then can be plastic-coated inexpensively (see Figure 3). These cards must be reviewed with any change in stand, cutting pattern, or log values.

MANAGEMENT AIDS

Apart from physical aids to log manufacturing, management should provide two other key elements for successful value recovery :

(a) Supervision and Training

Often the supervision of logging crews concentrates on volume production. However, supervisors should take a much more active interest in how the skidworkers are making their decisions and regularly monitor the logs produced to determine value lost and defects missed. This can be done on a formal basis using a system like AVIS or more casually by measuring logs on the stockpiles.

Most importantly, supervisors should themselves be able to assess a stem's quality, know how to cross-cut it to produce maximum value, and instruct skidworkers in these areas instead of allowing the crews to develop these skills on their own. Supervisors need these skills to be able to judge the skidworkers' performance and to train new workers.

The skidworkers should always be kept informed by the supervisor with regard to log specifications and values (a common problem is that skidworkers are not told the value of each log sort but are expected to cut grades with different priorities). Skidworkers should know, for example, if one grade is worth twice another to help them in their decision making.

(b) Incentives

Accurate cross-cutting undoubtedly has a significant effect on financial return. Therefore, if there is a sufficient difference among relative log values, an incentive should be offered to ensure the production of the higher valued products. This procedure has the effect of clearly stating management's objectives with

regard to the priorities for different log assortments. The degree to which a quality bonus affects any production bonus paid will have to be considered and reconciled.

It could be argued that a system of incentives is a double payment for doing what the skidworkers should be doing anyway. However, if management previously accepted a low recovery for a long time, then it would benefit if the marginal revenue were to increase.

CONCLUSIONS

The highest returns from our conventional log extraction and processing methods will only be obtained with a determined involvement from management. They must provide the correct tools to simplify the measuring process and the decision aids to help skidworkers make the best choices among many possible cutting options. Without this involvement, considerable value will continue to be sacrificed during log making.

REFERENCES

MARVL

- (1) Deadman, M.W. and Goulding, C.J. (1979): "A Method for the Assessment of Recoverable Volume by Log Types", New Zealand Journal of Forestry Science, Vol. 9, pp 215-239.
- (2) Mensuration Project Team (1979): "MARVL - A Method for the Assessment of Recoverable Volume by Log Types (User's Manual)", Computer Systems for Forest Management, New Zealand Forest Service, Rotorua, New Zealand.

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AVIS

- (1) Geerts, J.M.P. and Twaddle, A.A. (1985): "A Method to Assess Log Value Loss Caused by Cross-cutting Practise on the Skid", New Zealand Journal of Forestry Science, Vol. 29 (2).
- (2) Threadgill, J.A. and Twaddle, A.A. (1985): "Avis System User's Guide", New Zealand Forest Service, FRI Bulletin (in prep.)

For further information contact:

N.Z. LOGGING INDUSTRY RESEARCH ASSOC. INC.
P.O. Box 147,
ROTORUA, NEW ZEALAND.

Telephone: [073] 87-168