



NEW ZEALAND

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SURVEY OF FELLING TECHNIQUES

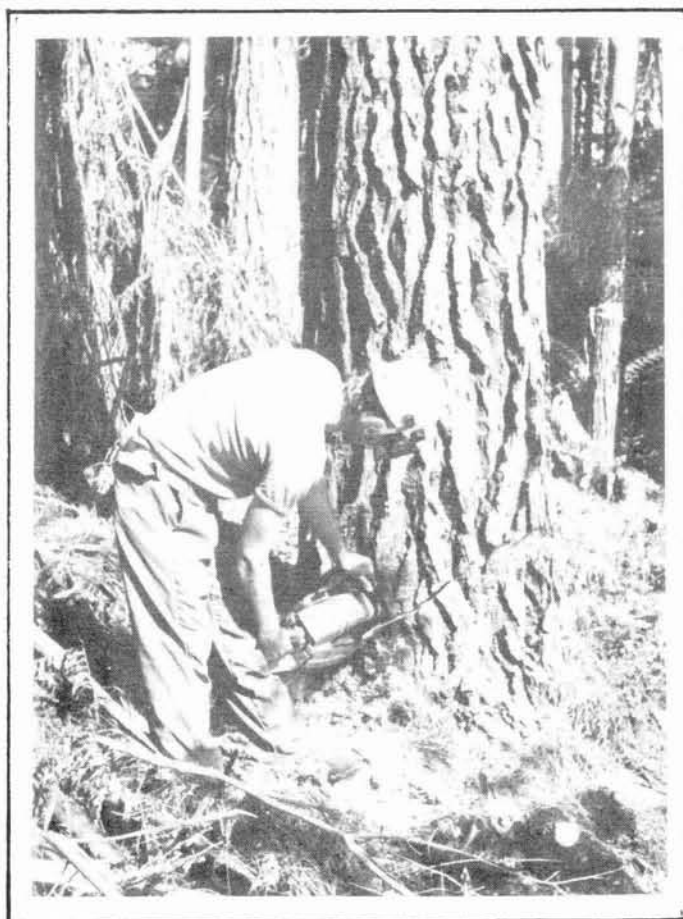
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INTRODUCTION

In June, 1979, LIRA received a grant from the Accident Compensation Commission to investigate improved felling and delimbing techniques and associated safety equipment. Swedish consultants (Swedfor Consulting AB) were employed to carry out a three months' research project in that field, starting January, 1980. It was emphasised that developed techniques and equipment should be suitable for New Zealand conditions.

Prior to the arrival of the consultants, LIRA carried out a survey of existing felling and delimbing techniques and associated equipment. The survey covered fallers in the Bay of Plenty, Hawke's Bay, Nelson and Auckland areas. A total of thirty fallers were studied.

As a result of that survey and research and development by LIRA and the consultants, recommendations were made concerning techniques and equipment (LIRA Project Report No. 14 "Development of Safe Felling and Delimbing Techniques with Chainsaws" 1980).



*Faller cutting first cut
of the scarf*

This report looks at a survey carried out two years later to assess progress.

ACKNOWLEDGEMENTS

LIRA acknowledges the co-operation of companies and fallers involved in these surveys.

THE SURVEY

A total of twenty-eight fallers were studied from the Bay of Plenty and Hawke's Bay, seventeen in thinnings and eleven in clearfelling. Of these, eighteen worked in contract gangs and ten in company gangs.

Between a half and a full day was spent with each faller. The type of saw, bar and chain was noted, as well as what protective equipment was used and ancillary equipment carried. The faller's technique of delimbing was compared with the technique developed in 1980 and subsequently taught in the Tarawera pilot scheme (Ref. 1). Notes were made on the felling technique, e.g. whether the top cut of the scarf was put in first, whether the tree did what it was supposed to, etc.

After the tree had been fallen, detailed measurements were taken at the stump. These included the amount and shape of holding wood, the depth of scarf and angle of scarf biscuit removed, and the height of the backcut above or below the scarf.

RESULTS

SAFETY EQUIPMENT

	<u>% of Fallers Surveyed</u>	
	<u>1982/83</u>	<u>1979</u>
<i>Bandages on belt</i>	7 %	0 %
<i>Chain guard or chain brake</i>	8 %	0 %
<i>Mitts</i>	89 %	95 %
<i>Leg protection (18% aprons/ 25% trousers)</i>	43 %	0 %
<i>Ear protection</i>	75 %	50 %
<i>Visors</i>	21 %	3 %
<i>Number of fallers surveyed</i>	28	30

This shows significant improvements in the use of safety equipment. Leg protection was recommended by the consultants as being essential for fallers and New Zealand made equipment is now readily available. The use of visors has improved, although they are often only used when delimbing and clearing the butt of the tree. Their use decreases when conditions get very hot.

SAWS

The consultants recommended the use of smaller saws with shorter bars in situations other than where old crop radiata was being felled. There appears to have been some movement to smaller saws. The majority of fallers in thinning were using saws less than 70 cc with the bar length varying from 15-21". In the 1979 survey, 50% of thinning fallers were using 80-90 cc saws with bars 18-24".

The saws used in clearfelling (old crop radiata) ranged from 80-100 cc's with the bars from 21-28" and there has been no change from the previous survey.

FELLING TECHNIQUE

Although putting in the top cut of the scarf first is recognised as a means of reducing overcutting, 44% of fallers are still putting in the bottom cut first. This, nevertheless, represents an improvement on survey results from 1979 when it was found that 66% of the fallers studied were putting in the bottom cut first. There has been a reduction in scarf overcutting with

the increased number of fallers putting in the top cut first. Consistent overcutting is, however, still occurring with those putting in the bottom cut first.

SCARF

	<u>Angle of Scarf</u>	<u>Depth of Scarf</u>
<u>Thinning</u>		
1982/83 - average	46°	26 %
- range	(18° - 84°)	(8% - 50%)
1979 - average	30°	33 %
- range	-	-
<u>Clearfelling</u>		
1982/83 - average	40°	28 %
- range	(17° - 60°)	(19% - 48%)
1979 - average	32°	34 %
- range	(26° - 45°)	(8% - 63%)

BACKCUT

90% of backcuts for clearfelling and thinning were above the scarf - an improvement on the 1979 survey results where 40% of the backcuts were below the level of the scarf. There were still a small number of backcuts that started above and finished below the scarf.

HOLDING WOOD

The remaining holding wood can be grouped into four categories :-

- (1) No holding wood - all holding wood being cut through.
- (2) Partially cut - the backcut had cut through to the scarf at some point. This could include anything from a few centimetres to almost all the holding wood having been cut.
- (3) Irregular - included holding wood which was markedly thinner at one end than the other and also that which was erratically shaped.
- (4) Even holding wood - showed little change in thickness over the full length.

The survey showed the following distribution of categories :-

		<u>Clearfelling</u>		<u>Thinning</u>	
	<u>Holding Wood</u>	<u>1982/83</u>	<u>1979</u>	<u>1982/83</u>	<u>1979</u>
(1)	None	1 %	8 %	18 %	37 %
(2)	Partially cut	24 %	29 %	29 %	35 %
(3)	Irregular	37 %	48 %	12 %	19 %
(4)	Even hinge	38 %	15 %	41 %	9 %

The best faller clearfelling had 73% of his trees with even holding wood, while the worst had 6%. In thinning, the best was 86% and the worst 7%. This once again shows significant improvement on that observed in 1979.

PROBLEM TREES

Of all trees studied in thinning, 17% hung-up, sat back, went sideways or fell backwards and 6% were used to drive hung-up or sitting back trees. In clearfelling, 13% either sat back, went sideways or fell backwards and 6% were used to drive other trees. The earlier survey showed much higher incidence of problem trees in thinning with up to 50% hung-up, not falling as intended or used to deal with other problem trees. In clearfelling, 27% of the trees were classed as a problem tree, or used to deal with problem trees.

DELIMBING

Apart from two fallers surveyed, who had been involved in the Tarawera pilot scheme (Ref. 1), there was little or no improvement in delimbing technique. Fallers are still tending to walk on the logs to delimb, even with shorter bars.

CONCLUSIONS

There has been a major improvement in fallers' attitudes towards the use of safety equipment, often a result of company policy. This is encouraging as much time is lost by the logging industry through accidents. The trend towards smaller, lighter saws, with shorter bars, also represents an improvement. The less weight a faller has to carry around all day makes the operation ergonomically better.

More education is required in the importance of the scarf cut being made with precision and how holding wood or hinge wood can affect the performance of a tree during felling. Fallers carrying out these operations correctly had a correspondingly high degree of accuracy which made subsequent sub-operations easier and more productive.

Delimbing which is the hardest and most time consuming part of thinning fallers' work, requires more attention. Little progress has been made in this area.

The results of this second survey indicate that the time, effort and money spent on this project have resulted in improvements in the overall field of felling and delimbing and associated equipment.

* Ref. 1 "Tarawera Pilot Scheme", J.E. Gaskin, LIRA Report
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