

int thin.

Equipment	Capital or Trade	Timed.	Prod. m ³ /machine hr
Forwarder	300000	380000	TI Had 15-3 med. 27
DD Skidder + Loader	143000		8:3

SESSION NO. 5
PAPER NO. (a)

FORWARDER EXTRACTION

Cable skidder + Loader (1/4) + Bell	290000		10
Cable skidder + Loader	423000	Clearfell	4.3
Cable skidder + Loader	453000		48

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+ cost of
skidding

Why have forwarders become so popular in the extraction and loading of wood in Australia? In 1970, APM Forests bought the first purpose built forwarder which was introduced into Australia, having had some experience with 'home made' forwarders based on Fordson County Four and County Six tractors for some years previously. In 1985, the only skidders left in our operations are working in country in which slopes commonly exceed 20 degrees. A skidder extraction operation in an Australian Pinus radiata plantation is now a comparatively rare sight.

There are benefits for the forest owner, the contractor and the customer in forwarding under Australian conditions.

FOR THE FOREST OWNER

- (a) You don't have to create landings, provided your road junctions occur reasonably frequently. Forwarders' productivity is reasonably insensitive to forwarding distance up to about 800m.
- (b) Forwarding is not the multi-pass operation that skidding is. The result is less soil disturbance than occurs with skidding. Research has shown that multiple passes are more damaging to the soil than a single, heavily laden pass.

FOR THE CONTRACTOR

- (a) You can extract wood on slopes of up to 20 degrees, provided you travel straight down the hill on the pick-up.
- (b) One man extracts and loads.
- (c) Only one machine is involved.
- (d) Combined with set-out trailers, the wood is generally unloaded straight from the forwarder on to the trailer or truck, thus avoiding double handling and reducing costs.
- (e) The hydrostatic transmission which is appearing on some forwarders can mean non-stop pick-up, low brake wear and improved ability to negotiate obstacles.
- (f) The operator is isolated from injury causing agencies.

- (g) Forwarders fitted with a bogey-bogey wheel system (8 x 8) are very good at climbing obstacles and have good stability and low ground pressure.
- (h) Productivity per man goes up when compared to a skidder operation. In a pine first thinning operation giving an average stem size removed of 0.14m³ (ie just over seven stems to the cubic metre) and producing pulpwood only, productivity is about 15.3m³/machine hour on a long term basis, behind hand cutters who are using the Dowling bench. This is for a 10 tonne capacity forwarder (the Osa 250). Using a 12 tonne forwarder (the Osa 260) behind Waratah harvesters, productivity increases to about 27m³/machine hour. In a mechanical pine clearfalling operation harvesting sawlogs and pulpwood, a 16 tonne capacity forwarder has a long term productivity of about 30m³/machine hour. Behind hand cutters, productivity in this operation drops to about 22m³/machine hour. Tree size in the clearfalling operation quoted averages about 1.2m³ merchantable volume. Don't forget, this includes loading the truck or set-out trailer. The marked difference in productivity between a forwarder picking up behind a mechanical compared to a hand operation is due mainly to wood which has been processed mechanically being bunched ready for quick pick-up.

FOR THE CUSTOMER

- (a) Wood is delivered practically free of grit. Some mills in Australia insist on forwarding for this reason alone. Particularly, TMP and panel board mills find this aspect attractive.
- (b) And the most important aspect - under Australian conditions, forwarders produce wood more cheaply than do skidders, under most conditions.

This paper would not be complete without some words of warning. Machine operators in APM Forests' operations in Gippsland, Victoria, Australia are mostly paid on a piece work basis, and earn between \$A500 and \$A1000 per week. If a man costs you that much, you have to have him on a highly productive machine. The situation could change dramatically if labour costs were not as high.

Productivity figures should be treated with caution. I have measured a 30% difference in productivity between two operators on similar machines in the same operation.

Capital and running costs will obviously vary considerably between NZ and Australia.

Finally, if you haven't got a flexible wood line at the mill, you are probably locked in to your existing system.