

BUSH BULLETIN

Forest Industries 1994 — Rotorua

In a previous bulletin we mentioned that we would look at some of the machinery and systems exhibited at the Forest Industries 1994 in-forest demonstrations.

One system showed a mechanised operation which is designed to operate on steeper ground than we in New Zealand normally associate with a mechanisation.

The operation featured a Timbco T440 feller buncher, a Timberline ST3530 stroke delimeter which also cut logs to length, and a Valmet 892 forwarder.

Timbco T440 Feller Buncher

This Timbco feller buncher weighs 25 tonnes and is mounted on Caterpillar D6 undercarriage componentry. It is powered by a 132 kW Cummins motor. The Timbco grapple has a 76 cm bar saw and is reported to hold constant to 55% (29 degrees).

The four-way two-cylinder cab is self-levelling and is complete with air conditioning and heater.



Timberline ST3530 Delimeter

The Timberline has the same motor and undercarriage as the feller-buncher. It has a 12.8 metre boom, an 88 cm butt saw, an 80 cm topping saw and 20 cm delimiting knives, and features a computerised measuring system. Four-way levelling is said to allow effective operation up to 85% (40 degrees).



Valmet 892 Forwarder

The Valmet forwarder weighs 16 tonnes and is powered by a 128 kW Volvo engine. The boom and grapple are both Cranab and the machine has a 16 tonne load capacity with up to 40 degree articulation and a ground clearance of 64 cm.



Evaluation of a Mechanised Harvesting System

A recent LIRO Report (Volume 19 No. 6 1994) looked at a similar system in a radiata clearfell operation at Bago State Forest in New South Wales. Let's look at the stand, topography and method of work.

Stand details

The stand was 35-years-old with an expected saw log recovery of 330 cubic metres/hectare. The mean height was 39 metres and the average DBH 50 cm.

Topography

The terrain was flat to rolling with clay soils. Heavy rains had preceded the study period.

Method of work

The feller-buncher felled the trees uphill, moving from the top of the slope downhill, returning to the top once a swathe was completed.

Delimiting was carried out in an uphill direction. Once a swathe had been delimited and processed, the machine moved to the bottom and repeated the process.

Log-length wood was extracted by the forwarder to a roadside dump and loaded out by front-end loader.

What about production rates?

(Mean tree size 2.2 m³)

1. Timbco feller-buncher	
Est. trees processed per machine hour	54
Est. production per machine hour	119 m ³
2. Timberline processor	
Logs per tree	3.7
Est. trees processed per machine hour	27
Est. production per machine hour	59 m ³
3. Kockums forwarder	
Mean load size	9.9 m ³
Logs per load	16.5
Average haul distance	192 m
Est. loads per hour	3.3
Est. production per machine hour	33 m ³

System balance

Under normal conditions in Australia, this system would comprise one feller-buncher, two delimiters and two forwarders. During the study abnormal conditions prevailed and no evaluation of balance could be made. Because the machines studied produced at different rates, care needs to be taken when designing systems in order to achieve system balance.

In some future Bush Bulletins we will look at other equipment that indicates the march of the machines.