THE WINDSOR RW 30 TREE HARVESTER

by

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I recently had the opportunity of working with the Windsor Tree Harvester, being demonstrated in Mount Gambier Radiata forests by Bill Kerruish of the Forestry and Timber Bureau.

The harvester is a machine developed by Bill as an example of how he envisages young plantation management a few years from now.

Briefly the argument runs thus : rising costs, mainly wages are forcing foresters to delay first thinning to an age where they will yield a reasonable economic return, a point beyond the silvicultural optimum. The solution is to mechanise as much as possible, eliminating the most unstable cost - wages. This will enable the thinning to be carried out when the stand will benefit most - with less regard to financial returns. And this is where RW 30 comes in.

The harvester is built around a Timberjack 303, four wheel drive and hinged in the middle. A 32 foot overhead boom runs the length of the tractor, mounted on which is a hydraulically operated "de-limbing" carriage. At the front - bearing quite a resemblance to a huge marron claw, is a clamp and shears - also hydraulic, on an 8 foot swivelling arm. The driver's cabin is at the right hand front side and a carrying tray on the left.

In operation the Harvester drives up to a tree - grasps it at ground level with the clamping jaws, and cuts it off with the shears. The tree is then lifted bodily and laid on the boom and delimbing carriage. The jaws of the carriage then close forming a collar around the tree, and the carriage moves rapidly to the other end of its boom, removing the limbs as it goes. When it reaches the end of the boom or the minimum diameter of crown required, another pair of shears removes the unwanted crown which is passed out the back while the log rolls down onto a carrying tray.

The standard of trimming naturally varies with the form of the tree, but generally is a little below that of hand trimming. Stumps, if anything, are lower than saw cut stumps, and surprisingly there is practically no shatter from the biting action of the shears, on the stump or the log. Double leaders can be treated as one if they're not too large. In the case of a tree unable to be treated - examples were large multiple leaders, trees with very heavy branching - or trees too small to be treated, they are still cut but passed to the rear by the de-limbing carriage and discarded.

The harvester was operated in medium to low quality thirteen year old P. radiata at Caroline Forest, and good second rotation radiata, twelve years old, belonging to Softwood Holdings at Kongorong. Both areas were cut on a third row outrow system, i.e. one row in three removed. The "claw" at the front of the machine is able to swivel about 40 degrees left or right, so is able to selectively thin the row on either side of the outrow.

Results were far better at Kongorong than Caroline solely due to the better form of the trees there. Poor form at Caroline caused a number of trees to be rejected and some time wasted on others. However, time per tree, taken over the whole operation averaged around 20 - 30 seconds, and surveys of wastage are in progress at the moment, but preliminary figures indicate only about 2 - 3%.

The shears can handle a tree up to 16 inches diameter at the ground, but the size handled most comfortably is 5 - 10 inches. The system envisaged by Kerruish is suing the Windsor as a forwarder - carrying logs from the outrows - necessarily fairly short, to waiting transport.

In about fifteen months of operation so far the Harvester has been tried in pine - up to sixteen years old and eucalypt regeneration up to 9 inches diameter. A 16 degree slope was handled well, as long as the rows run up and down the hill, however areas cleaned and broadcast burned present problems in so far as logs and stumps hindering the machine.

To be successful mechanised thinning, along the lines of the Windsor Harvester, will need several things. The concept of row thinning - be it third, fifth or anything else, could be a bitter silvicultural pill to swallow after so many years of well spaced, hand selected plantations. However, it is essential to mechanical operation.

The loss of selectivity of thinning should be largely offset by more uniform quality of trees coming from improved seed sources as breeding programmes progress. This also is important when the tree is to be handled by a machine from the stump to the mill. Problems of trees with abnormal form at Caroline demonstrated this.

Plantations will need to be planned for the type of operation intended. Various things will become apparent when a system like the Windsor becomes practice; as the Windsor is planned as a forwarder it would be more suited to short rows between access tracks, the degree of pre-planting clearing is important for access purposes, planting spacings could be revised to suit row thinning, and so on.

The Windsor Harvester was financed about one third by A.P.M. and the remainder by the Commonwealth. The cost of the machine to date is about $38,000. It is the first prototype and work is due to commence on the MK II version shortly.

My impressions were that this system could be worked in Western Australian plantations, more successfully in coastal plain areas, and moderate hills plantations provided the degree of initial clearing was good enough. Also an outlet for the large volume of small diameter material is necessary. Pulp and chip industries take care of this adequately in Mount Gambier and also the plantations areas here are fairly evenly distributed in a twenty to forty mile radius of the town, so transport distance is no problem.