SMALLWOOD HANDLING AT THE MILL

C.J.KERR
Tasman Pulp & Paper Co.Ltd.

In this context I have defined "smallwood at the mill" as excluding post and pole material, sawlogs and fuelwood. It therefore falls into the categories of pulpwood or panel product furnish.

The wood handling sections of the mills will therefore have to prepare:

(a) uniform length roundwood billets for mechanical pulp from stone grinders or

(b) chips for mechanical pulp from refiners or

(c) chips for chemical pulp from digesters or

(d) chips for fibreboard from refiners or

(e) flakes for particleboard.

There are variations in some of these and some mills prepare multi-purpose furnishes, but in all cases the roundwood must be debarked, and for an annual throughput of more than say 100,000 cubic metres there is no doubt that drum barking is the most efficient and cheapest way to do this.

In the New Zealand situation smallwood is synonomous with tops and thinnings of P.radiata and it is important to understand that this material has:

- a low density
- a high proportion of juvenile fibre (in fact in most cases it is all juvenile)
- a very high moisture content

and it therefore poses technical problems to some users, for example:

- its high moisture content gives rise to drier limiting conditions in particleboard manufacture
- it produces low yield, low strength chemical pulp

and therefore it normally has to be prepared as part only of the

total plant furnish - i.e. it has to be mixed slowly and uniformly.

It is also important to understand that all other things being equal the landed cost at the mill will determine whether or not smallwood is acceptable. Smallwood is inevitably fairly high cost material before it leaves the forest and its handling problems together with its technical characteristics do not help its acceptability.

What are its handling problems? First of all, smallwood breaks more easily than larger roundwood so handling should obviously be minimal.

There is usually a good deal of malformation - inevitably so with radiata thinnings - so linear movement in long lengths is difficult.

Piece size is small - probably down to 10cm small end diameter so piece by piece linear movement will result in very low production rates.

I do not think any of us in New Zealand can claim to have ideal smallwood handling equipment - we are generally using harvesting, transport and handling equipment designed for and much better suited for larger logs - probably from 25 plus year old plantation grown trees.

Briefly then we should look at what might be the ideal design for dealing with P.radiata below 30 cm in diameter - i.e. the tops of all trees (they'll always be there) and thinnings (one way or another they'll be there too).

Assume we require a throughput of say 200,000 m^3 per year and assume we require debarked short lengths (for grinding, or chipping or flaking) and assume also the raw material arrives in mixed 5 m. to 8 m. lengths.

The criteria then are:-

(a) gentle handling to minimise breakage;

(b) slashing to provide short lengths (accurately if they are for grinding);

(c) drum barking - because it is the cheapest and most efficient.

Our equipment needs become:-

(a) an unloading method that lifts the whole packet at once - gantry/grapple, or large stacker;

(b) a feed deck on which that whole packet can be deposited and spread so it does not jackstraw;

(c) a cherry picker or unscrambler or pinstop and kicker to feed the slasher;

(d) a trough and single saw type slasher if the lengths are not critical and a multiple saw slashdeck if they are;

(e) an infeed conveyor to the drum barker that also has the ability to accept shortwood delivered direct from truck without any rehandling;

(f) a drum barker with a variable rotation speed and variable outfeed gate so fluctuations in delivery can be coped with.

From this stage on the design is dependent on the end use of the wood, and the waste from that wood.

All this may be summarised by the statements that from a mill point of view there are not too many problems with smallwood if one has the appropriate equipment, but of course the consumption rate must be high - probably above 100,000 m^3 per year - before that equipment can be justified.