Harvest Optimisation
A case study of HFM NZ Northland

Outline

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2. HFM NZ Northland mechanised.
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The Northern Area
Taumata Plantations Limited

Productive Area 48,486 Ha
Harvesting 1.2 M tonnes

HFM NZ Northland mechanised

Already have the basics in place for mechanical log making to use optimisation software.
1. Logging operations are already mechanised.
2. 16 crews out of 24 are log making with processors.
3. Working conditions over autumn to spring - mud
4. Lack of available labour for expanding harvest
5. Majority hauler terrain has resulted in mechanisation.
What made us start?

1. HVP presentation on the value recovery work that included the introduction of optimisation software in processing machines.
2. Perception that mechanised log making destroys value.
3. Already have the machines and some already had the software.
4. Making sure that operators have the best tools to maximise value.
5. Looking at what data the machines recorded.
6. System was already present, could get going with little cost involved.

General Setup

Forest Owner / Manager needs to work out the number of grades (assortments) and lengths that are being cut.

Divide them up in to groups defined by the log characteristics:
- Knot size
- Sweep, Wobble
- Spike knots etc

This creates the quality groups (A or 1 onwards)

Have 8 quality groups (A to H) to associate log grades (assortments) to

Create an APT file (cut plan) with grades (assortments) ranked to reflect priority / value
Quality Characteristics

**SOFTWOOD OPTIMISER LOG QUALITY CODE SPECIFICATION**

<table>
<thead>
<tr>
<th>DEFECT</th>
<th>1 QUALITY</th>
<th>2 QUALITY</th>
<th>3 QUALITY</th>
<th>4 QUALITY</th>
<th>5 QUALITY</th>
<th>6 QUALITY</th>
<th>7 QUALITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knots</td>
<td>No Knots</td>
<td>5 cm</td>
<td>7 cm</td>
<td>10 cm</td>
<td>12 cm</td>
<td>20 cm</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Wobble</td>
<td>SED/6</td>
<td>SED/1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sweep</td>
<td>SED/4</td>
<td></td>
<td>SED/2</td>
<td>SED/1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spike Knots</td>
<td>X</td>
<td>14 cm</td>
<td>20 cm</td>
<td>No Restriction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality</td>
<td>10 cm</td>
<td>SED/10</td>
<td>10 cm</td>
<td>No Restriction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Node Swelling</td>
<td>X</td>
<td>5 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There are 8 quality groups available, this example just uses 7.

Quality and Grades (Assortments)
How the process works

The operator uses the quality buttons like a simple MARVL description of the log they are cutting.
The stem is NOT described before the log making begins.
The process is a partnership between the operator and the computer.
This is not a TimberTech / AVIS approach to log making.
The operator judges sweep, branches and other defects.
The operator has override options to change length / grade (assortment) of each log.
More variation in the stem means more work for the operator.

Advantage to Forest Owner / Manager

• Get the grades cut that are in the current plan.
  • Not last weeks grades
  • Not just grades on easy to reach buttons
• Increased production
  108% on average for 3 crews.
• Value recovery
  Meets our target & comparable to manual log making.
  • Operators are able to cut down to min SED’s on grades.
Advantage to Forest Owner / Manager

- More production information available on daily basis.
- Detailed data on grades.
- If you have new equipment chances are the system is already on board.
- All the manufacturers use the same data standard
  - StanForD.
  - One bit of software will create cut plans and read production files.

Example of Data – Grade Distribution
Example of Data – Length Distribution

Example of Data SED distribution
Advantage to the Operator / Contractor

- Reduced operator fatigue
  Operators not having to constantly think about the log making options
- Less hand / wrist strain
  Several operators commented on wrists no longer hurting
  Less button pushing
- Better production
  The above factors combine to on average better production.
- Given the choice no operators will change back to the manual system they came from.

Can processors cut logs to right length?

An issue which is guaranteed to spark discussion or even argument in the right circumstances.

Machines can cut to length, provided all the settings are correct.

There are 3 settings and they all need to be correctly setup and maintained.

1. Overall calibration
2. Butt Log factor
3. Topping Saw factor
Getting the right log length

Machine is out of calibration and has several factors causing logs on average to be too long.

Getting the right log length

Machine that is calibrated and producing logs that are within length specification.
Summary

- The software has been around for 20 years, developed in Scandinavia.
- If you have new machines operating, chances are they may have this system.
- Going forward, this system is likely to be more common on new equipment.
- There are benefits for both the forest owner / manager and contractor.
- Given the choice no operators will change back to the manual system they came from.