COMPARISON OF STANDING TIMBER SORTING WITH BUCKING BY HARVESTERS

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Area’s Potential for Harvester Technology in Czech Republic
Aim of the Study

1. Differences among timber volume outputs obtained from harvesters, manual measurements and standing timber volume.

2. Compare the ratio of produces assortments volume with the volume according to assortment tables.
Methodology

StanForD Classic
*.stm

StanForD 2010
*.hqc
## Methodology
### Production and Price types

<table>
<thead>
<tr>
<th>Spruce Assortment</th>
<th>price type</th>
<th>min. top diameter (cm)</th>
<th>nominal log length (m)</th>
<th>specified quality</th>
<th>quality class</th>
</tr>
</thead>
<tbody>
<tr>
<td>round timber</td>
<td>m3toDE</td>
<td>20</td>
<td>4,00</td>
<td>1,2,3,4</td>
<td>III.</td>
</tr>
<tr>
<td>aggregate</td>
<td>m3toDE</td>
<td>12</td>
<td>4,00</td>
<td>1,2,3,4,5</td>
<td>III.</td>
</tr>
<tr>
<td>saw logs (KPZ)</td>
<td>m3toDE</td>
<td>17</td>
<td>4,00</td>
<td>6</td>
<td>III.</td>
</tr>
<tr>
<td>mechanical pulpwood</td>
<td>m3f</td>
<td>8</td>
<td>2,00</td>
<td>1,2,4</td>
<td>IV.</td>
</tr>
<tr>
<td>selection pulpwood</td>
<td>m3toDE</td>
<td>12,5</td>
<td>2,45</td>
<td>1,2,3,8</td>
<td>V.</td>
</tr>
<tr>
<td>pulpwood</td>
<td>m3f</td>
<td>5</td>
<td>2,00</td>
<td>1,2,3,4,7</td>
<td>V.</td>
</tr>
<tr>
<td>„waste“</td>
<td>m3f</td>
<td>3</td>
<td>0,01</td>
<td>1,2,3,4,5,6,7,8</td>
<td>-</td>
</tr>
</tbody>
</table>

**m3toDE**: Volume is based on measured diameter at a point in the middle of the log and price classification is based on top diameter.

**m3f**: Volume is calculated from the real section diameter (section = 10 cm). Diametr is non-rounded off. Price classification is based on the top diameter.
Methodology
Calculation of Timber and Procedure of Standing Timber Grading
Produced Timber Volume according to Harvesters Software

- Round timber: 0.184 vs. 0.195
- Aggregate: 0.096 vs. 0.102
- Saw logs: 0.181 vs. 0.194
- Mechanical pulpwood: 0.019 vs. 0.072
- Selection pulpwood: 0.069 vs. 0.035
- Pulpwood: 0.035

Calculation by price type vs. calculation by section.
Comparison of Assortment Volume according to Selected Methods

-0.5% -0.9% -0.4% +8.8% -1.0% +4.4% +0.1% +16.0%

Total difference 1.5%

- calculation by price type - calculation by Czech standards
Ratio of Assortments in Quality Classes according to Selected Methods

<table>
<thead>
<tr>
<th>Quality Grade</th>
<th>Production of harvester</th>
<th>Plan - assortment tables</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. - IV.</td>
<td>46.9%</td>
<td>53.2%</td>
</tr>
<tr>
<td>V. - VI.</td>
<td>50.7%</td>
<td>47.9%</td>
</tr>
<tr>
<td>unclassified assortments</td>
<td>2.3%</td>
<td></td>
</tr>
</tbody>
</table>
Conclusion

• There is no legal norm in the Czech Republic which would stipulate the maximum allowable deviation from the recommended rules.
  – For the largest forest owner in the country (Forests of the Czech Republic, State Enterprise) the permissible tolerance is 2 %.
  – The commonly tolerated deviation is up to 5 %.

• The main fact that the harvester measures and calculates timber volume with the accuracy of three decimal places, while manual calculations involve rounding down to a whole number and volume is calculated with the accuracy of two decimal places.

• **Recommended Rules for Electronic Scaling of Timber in the Czech Republic**
Thank you for your attention