

## The impact of thinning intensity on forwarder loading

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### **Abstract:**

*The state of the art of forwarding efficiency shows that many factors play an important role in achieving good productivity and satisfactory economic results. One factor studied less often is the amount of wood available for forwarding on a unit area. The amount of wood can be regulated by different thinning intensity, which eventually influences the effectiveness of the forwarding.*

*The main objective of the research was to find out the impact of higher thinning intensity on the loading productivity of the Valmet 860 forwarder. Additionally, the use of the forwarder grapple was analysed, which was based on the number of logs taken in one grapple during loading and unloading to provide optimal wood distribution along the strip roads.*

*The research was carried out in a 55-year-old pine stand in Northern Poland, Forest District Lidzbark, plot 206a. The forwarding of 2.5m long pulp wood (S2a: diameter 5-12cm under bark and S2b: diameter >12cm under bark) was carried out by the Valmet 860 on 18 sample plots, 0.25ha each. The intensity of thinning varied from 43,52 to 98.12 m<sup>3</sup> ha<sup>-1</sup>, divided into to groups of plots: P1, of lower, and P2 of higher thinning intensity. The forwarding was carried out on 3m wide, parallel strip roads running every 20m.*

*An average growth of 31% of thinning intensity (from 57.56 to 75.56 m<sup>3</sup> ha<sup>-1</sup>) resulted in 21% better loading productivity (from 23.14 to 28.08 m<sup>3</sup> h<sup>-1</sup>). Better use of the grapple was observed in P2 plots: 38% more logs were collected in one grapple when loading S2a and 19% more logs when loading S2b. When unloading, more logs of S2a and S2b were grappled: three times more and twice more respectively*

**Keywords:** forwarder productivity, thinning intensity

**Remark:** Full paper has not been submitted.