

Baltic ForBio, WP 2, GA 2.4

Information about thinnings demonstrating biofuel and roundwood production (714-230-18)

Information about stand

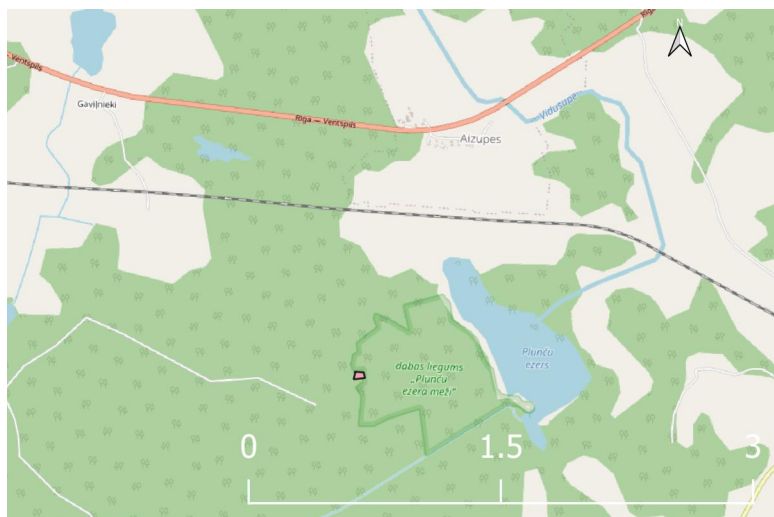
Basic information

State	Latvia
Region	Kurzeme
Stand ID	714-230-18
Area (ha)	0.2
Thinning year / season	2016
Topic	Thinning with Vimek 404 T5 harvester

Characteristics of work environment and soil bearing capacity

Good logging conditions, logging can be done all year round without the use of tracks and without placing logging residues in technological corridors.

Location of demo site



Coordinates of plot centre: X - 401410 Y - 338322 (LKS92)

Figure 12: Location of compartment¹⁵.

Stand characteristics before harvesting

Average DBH (cm)	10
Average height (m)	8

¹⁵ Background map from Google maps and map of Latvia from www.envirotech.lv

Number of trees (trees per ha⁻¹)	1650
Growing stock (m³ ha⁻¹)	111
Stand composition	8P2B
Stand age during thinning	30
Dominant species	Scots pine
Stand type	Ln (<i>Myrtillosa</i>)

Stand management targets

To increase forest value by extraction of damaged and small size trees and to ensure favourable growth conditions in the stand. Harvesting is done so to reduce negative impact to environment (avoid ruts formation, mechanical damages of remaining trees and soil compaction). Small dimension trees should be used for biofuel production and from bigger trees standard roundwood assortments (small logs and pulpwood) should be produced.

Stand characteristics after thinning

Average DBH (cm)	13
Average height (m)	14
Number of trees (trees per ha⁻¹)	1100
Growing stock (m³ ha⁻¹)	84
Stand composition	9P1B
Dominant species	Scots pine



Figure 13: Stand characteristics after thinning¹⁶.

Mechanical damages due to thinning

Damage to the remaining trees does not exceed 3%, no ruts have been detected.

Applied work method in thinning

Work order considers thinning to minimal basal area or number of trees according to average tree height after thinning.

Distance between technological corridors 20 m with "ghost paths" between the corridors, which are used only by harvester.

Logs are located along the technological corridors. Undergrowth trees are not extracted before mechanized thinning.

The applied work method considers leaving of small dimension trees (including technologic corridors if their $D_{1.3} < 6$ cm, if they are not hampering harvesting operations, but, if such small tree is harvested (cut down) it should be dropped without delimbing in area where it is not becoming an obstacle to harvesting and forwarding operations

Harvesting is done using compact class harvester Vimek 404 T5 a equipped with Keto Forest felling head (2. Fig.). Harvester is equipped with CAT C2.2T engine¹⁷ (44 kW, 2700 RPM,); harvester width 1.8 m (with large tyres – 2.15 m), length – 3.35 m; tyre size 405/70-24; MOWI 2046 crane reach distance 4.6 m, weight 400 kg; clearance – 40 cm; harvester weight – 4400 kg; fuel consumption – 4 L per hour; control system – Motomit IT. Forwarding is done using compact class machine Kranman Bison 10000.

¹⁷ In previous models Kubota V2003T engine



Figure 14: Harvester Vimek 404 T5¹⁸.



Figure 15: Kranman Bison 10000 forwarder¹⁹.

Harvesting productivity

While producing biofuel in pre-commercial thinning (average extracted tree $D_{1.3}$ 8 cm or 0.03 m^3), average productivity of harvester is $3.1 \text{ m}^3 \text{ h}^{-1}$.

¹⁸ Photo: G. Spalva.

¹⁹ Photo: G. Saule.