

REDUCTION OF WOOD BASIC DENSITY IN DECAYED GREY ALDER STEMS

Jānis Liepiņš; Alise Bleive; Kaspars Liepiņš; Andis Lazdiņš

Conference “Rural Development 2021: Challenges for
Sustainable Bioeconomy and Climate Change

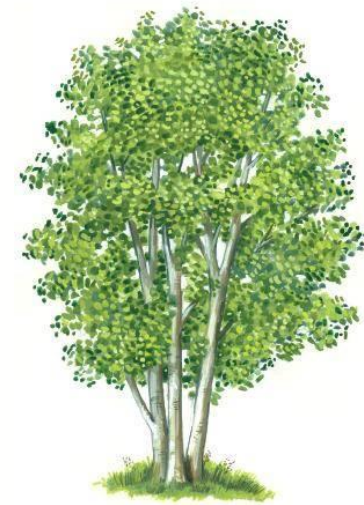
September 21-23th, 2021

Objective of the study



The aim of this study is to estimate the impact of the internal stem decay on wood basic density in grey alder stems.

*According to national forest inventory data, grey alder forest stands cover 10.2% of the total forest area in Latvia.



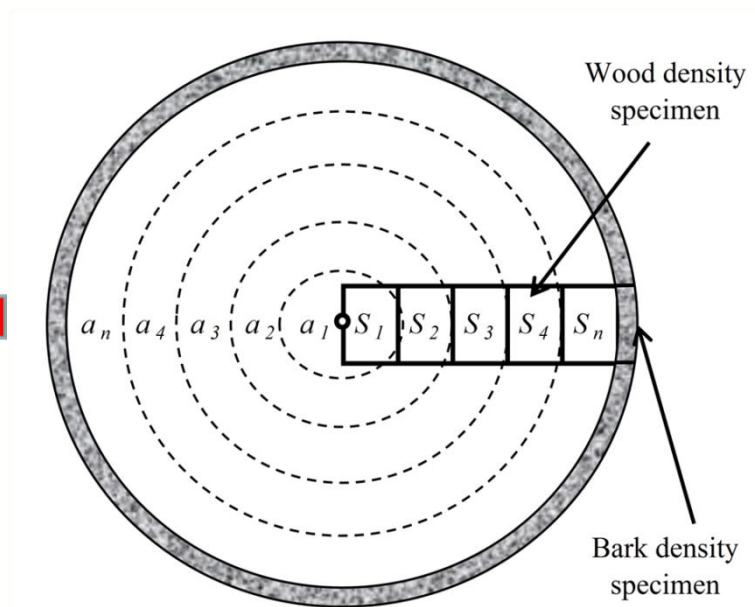
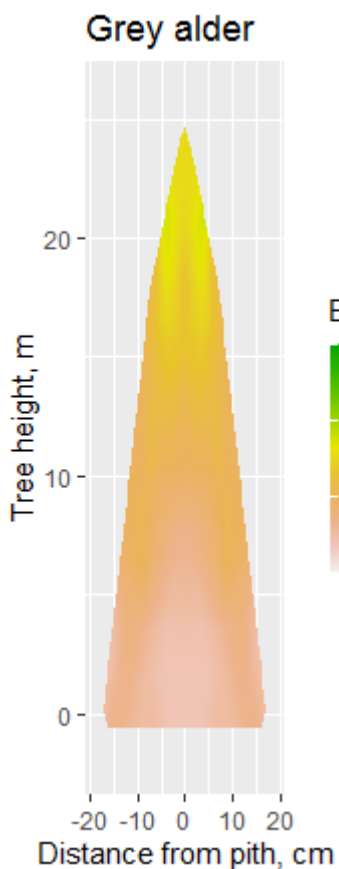


Introduction

- Internal stem decay is a naturally occurring process, common to all forests and most prevalent in the lower boles of older trees;
- Data on basic density in tree stems are needed for biomass estimation as determined by multiplying the stem volume with the average stem density;
- Biomass equations have typically been developed from healthy, decay-free trees.

Study material (I)

Exploring variations of basic density within healthy grey alder stems



Equations for estimating the above- and belowground biomass of grey alder (*Alnus incana* (L.) Moench.) and common alder (*Alnus glutinosa* L.) in Latvia

Jānis Liepiņš, Kaspars Liepiņš & Andis Lazdiņš

Pages 389-400 | Received 11 Nov 2020, Accepted 24 May 2021, Published online: 09 Jun 2021



PostDoc
Latvia

Study material (II)



- Five grey alder forest stands;
- 21 decayed tree stems and 15 healthy tree stems;
- The densities of 401 intact wood, 212 discoloured wood and 117 spongy rot specimens were measured from the sampled trees.

Methods (I)

Through Resistograph technology, it is able to detect wood decay, stages of rot, hollow areas, cracks and ring structure.

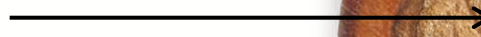


RESISTOGRAPH® 650-EA with 50 cm drilling depth

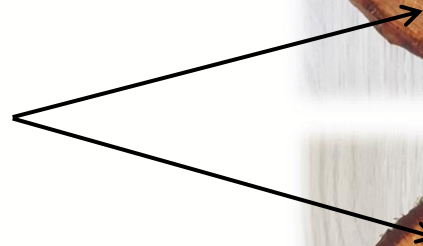


Methods (II)

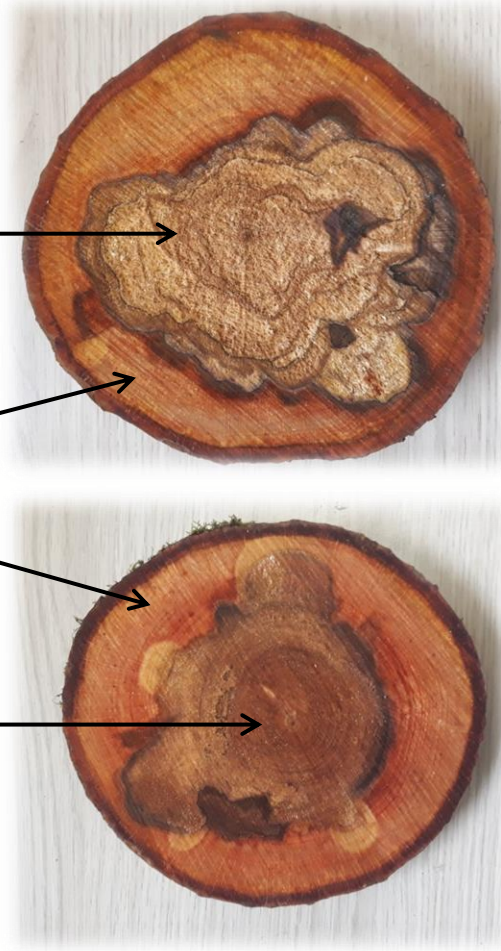
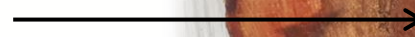
Spongy rot



Intact wood



Discolored wood



Methods (III)



Results and Conclusions (I)

Forests stands of grey alder investigated

Stand Nr.	DBH _g , cm	H _g , m	Number of trees ha ⁻¹	G (m ² ha ⁻¹)	Age (year)	Stand volume, m ³ ha ⁻¹	Decayed trees containing spongy rot, %
1	20.9	23.7	580	19.7	54	212.0	27.6
2	20.1	24.4	1240	39.2	40	437.9	17.7
3	31.0	24.2	420	31.7	70	341.9	80.9
4	21.8	21.3	960	35.8	55	348.2	23.0
5	20.7	21.7	820	27.6	37	274.9	2.4

Average

30.3%



PostDoc
Latvia

Results and Conclusions (II)



The mean basic density of intact wood differed significantly ($p < 0.01$) from the mean density of discolored wood and spongy rot.

*Different letters indicate statistically significant differences.

Thank you for your attention!



This research was funded by the European Regional Development Fund's Post-doctoral Research project No. 1.1.1.2/VIAA/4/20/687 "Reducing uncertainty in the calculation of forest stand biomass and carbon stock in Latvia".