

Wood chips quality produced from dieback affected Narrow-leaved ash (*Fraxinus angustifolia* Vahl) trees

DANI
DOKTORATA
BIOTEHNIČKOG
PODRUČJA

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Introduction – motivation for the study

- The Narrow-leaved ash is the sixth most common species in the total woodstock volume of Croatia.
- The regular shelterwood management method is applied and harvesting is based on the buck to quality method.
- The new fungal disease caused enormous tree dieback in the lowland forests.
- The research aimed to determine the quality of wood chips produced from the dieback affected trees.



Introduction – what are wood chips?

- Small to medium sized pieces of wood produced by cutting larger pieces of wood.
- Mostly produced from the tree residues.
- They are commonly used as a solid biofuel for heat and electricity production.



Fig. 1 Wood chipper

Fig. 2 Produced wood chips



Introduction – what is wood chips quality?

- It is defined by wood chips physical and chemical properties, e.g. ash and moisture content.
- It is directly connected to the raw material quality.
- It is important for the efficient work of heating or electricity plant.



Fig. 3 High quality wood chips

Fig. 4 Low quality wood chips



Materials and methods

- The research was conducted in the area of management administration Vinkovci

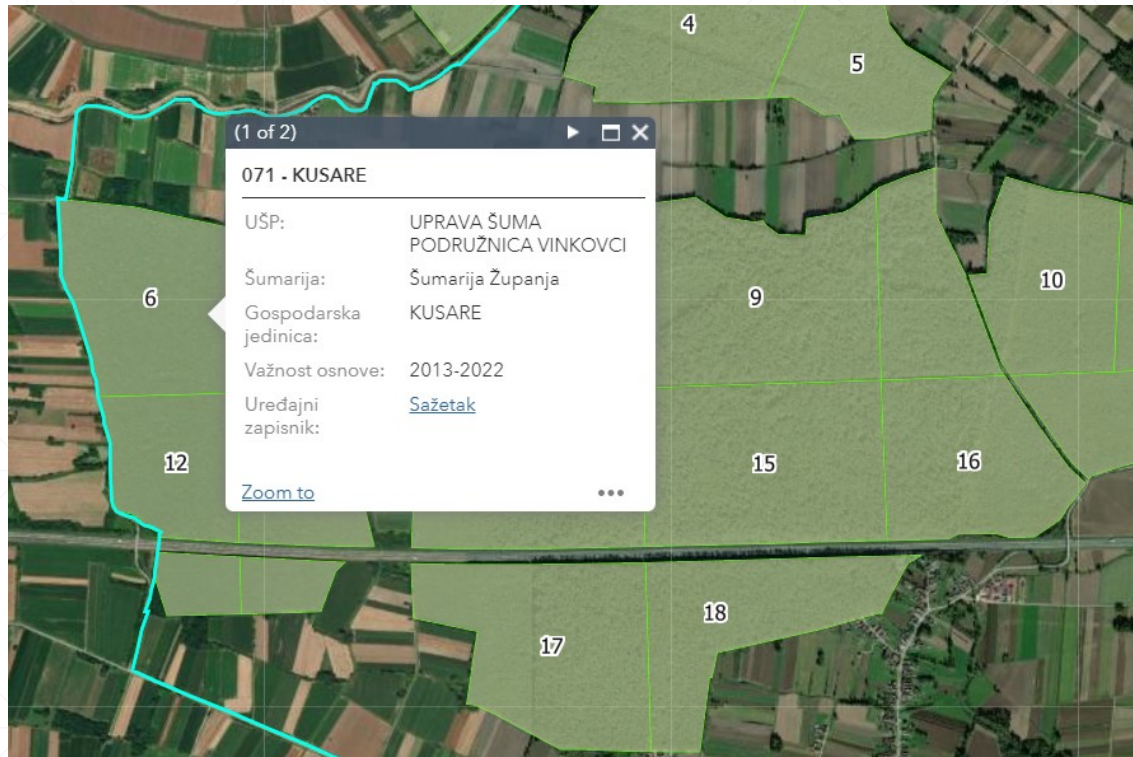


Fig. 5 Research area

Materials and methods

- The crown defoliation degree was estimated according to the ICP guidelines, and they were classified into three crown defoliation degrees.

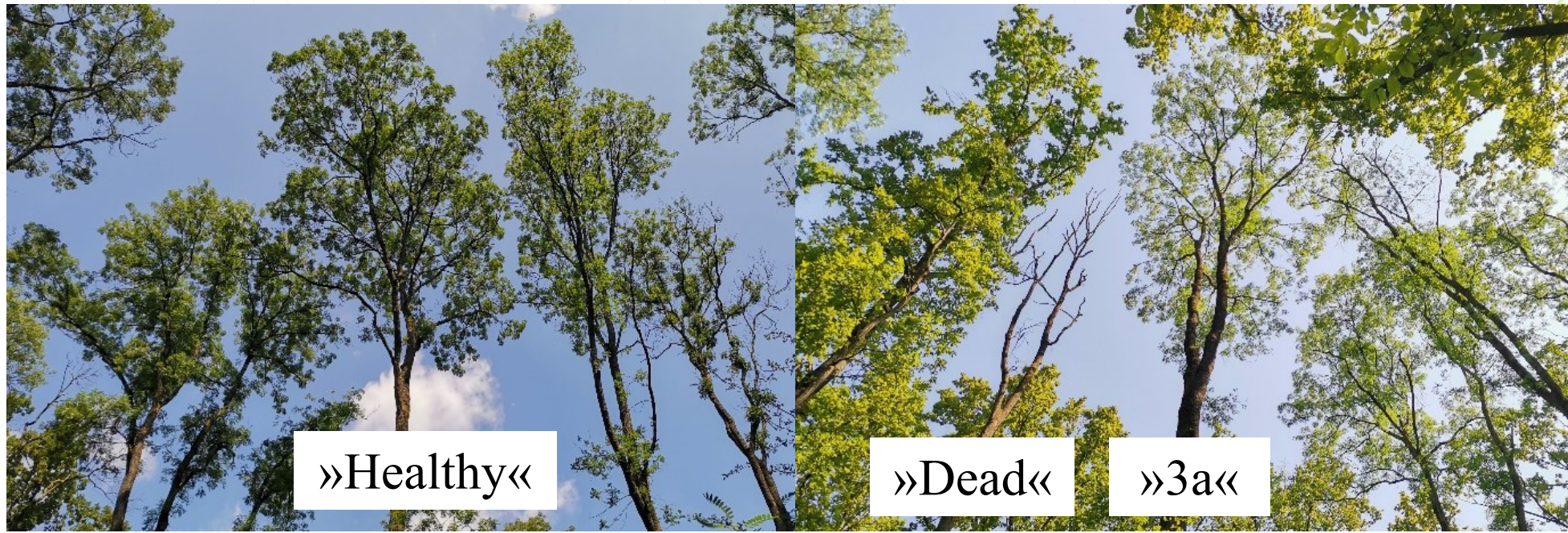


Fig. 6 Tree crown defoliation degree estimation



Materials and methods

- Wood chips were produced from the chosen trees and sampling was done according to the HRN EN normative for solid biofuels.
- In total, nine samples were taken to determine the moisture and ash content, particle size distribution and calorific value.



Results – moisture content

Crown defoliation degree	Sample	M, %	%
Dead	22-R-4-3-1	32,0	29,5
Dead	22-R-4-3-2	29,1	
Dead	22-R-4-3-3	27,3	
»3a«	22-R-4-2-1	32,3	30,3
»3a«	22-R-4-2-2	30,3	
»3a«	22-R-4-2-3	30,7	
Healthy	22-R-4-1-3	30,0	30,7
Healthy	22-R-4-1-2	30,6	
Healthy	22-R-4-1-1	31,5	

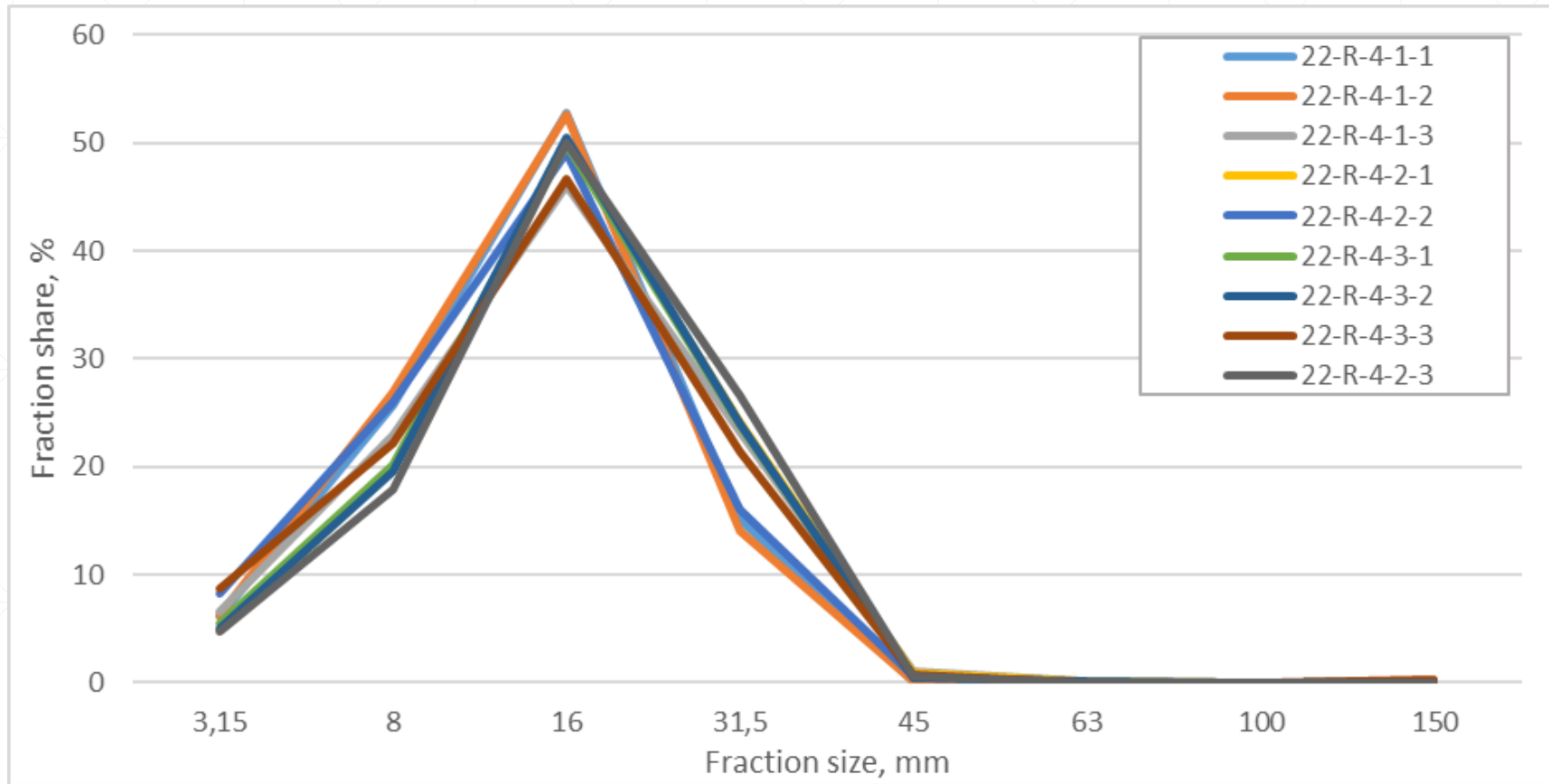


Results – ash content

Crown defoliation degree	Sample	A, %	%
Dead	22-R-4-3-1	1,7	1,5
Dead	22-R-4-3-2	1,4	
Dead	22-R-4-3-3	1,4	
»3a«	22-R-4-2-1	1,3	1,4
»3a«	22-R-4-2-2	1,6	
»3a«	22-R-4-2-3	1,3	
Healthy	22-R-4-1-3	1,2	1,3
Healthy	22-R-4-1-2	1,3	
Healthy	22-R-4-1-1	1,4	



Results – particle size distribution



Results – calorific value

Crown defoliation degree	Sample	Q, MJ/kg	MJ/kg
Dead	22-R-4-3-1	19,60	19,59
Dead	22-R-4-3-2	19,57	
Dead	22-R-4-3-3	19,60	
»3a«	22-R-4-2-1	19,59	19,60
»3a«	22-R-4-2-2	19,66	
»3a«	22-R-4-2-3	19,54	
Healthy	22-R-4-1-3	19,70	19,63
Healthy	22-R-4-1-2	19,67	
Healthy	22-R-4-1-1	19,51	



Instead of a conclusion

- Considering the results of the research, dead trees can still represent good quality raw material for energy production.
- In the continuation of the research, it is necessary to increase the number of samples for the statistical analyses.





Thank you for your attention!

