

THE IMPACT OF WILD GAME AND LIVESTOCK ON ACTIVELY MANAGED COPPICE - QUANTIFYING THE OVERLYING ORGANIC HORIZON AND CARBON STOCK UNDER TRADITIONAL FOREST MANAGEMENT AT TRAINING FOREST ENTERPRISE, MASARYK FOREST KŘTINY

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THE AIMS OF THE PROJECT

The primary objective of this project and research is to assess the impact of traditional farming practices on forest ecosystems, with a specific focus on pedological and dendrometric properties. Additionally, the study aims to examine the effects of wildlife and domestic animal management on these forest ecosystems.

THE METHODS AND MATERIALS

To assess the findings of this research, a total of 15 research plots with varying management practices were established. From each of these plots, four soil samples were collected. The focus of the evaluation lies primarily on the pedological properties, specifically the carbon stock, measurements of the overlying organic horizon, the quantity of litter, and the Ah horizon. These parameters serve as the main subjects of analysis in this study.

RESEARCH PLOTS

The research was conducted in a forest area called "Hradisko" situated in the Masaryk's Forest Křtiny. These specific forest stands were deemed suitable for the study. The plots were established in 2017 and are situated within sessile oak stands. The forest density in this area is 80 standards per hectare. A total of 15 research plots, measuring 40 × 30 m each, were set up. These plots vary from one another based on the type of forest management employed. The different types include "No grazing and litter raking," "Grazing and litter raking," "Grazing and no litter raking," and "No grazing and no litter raking." In picture number 1 we see the research area.

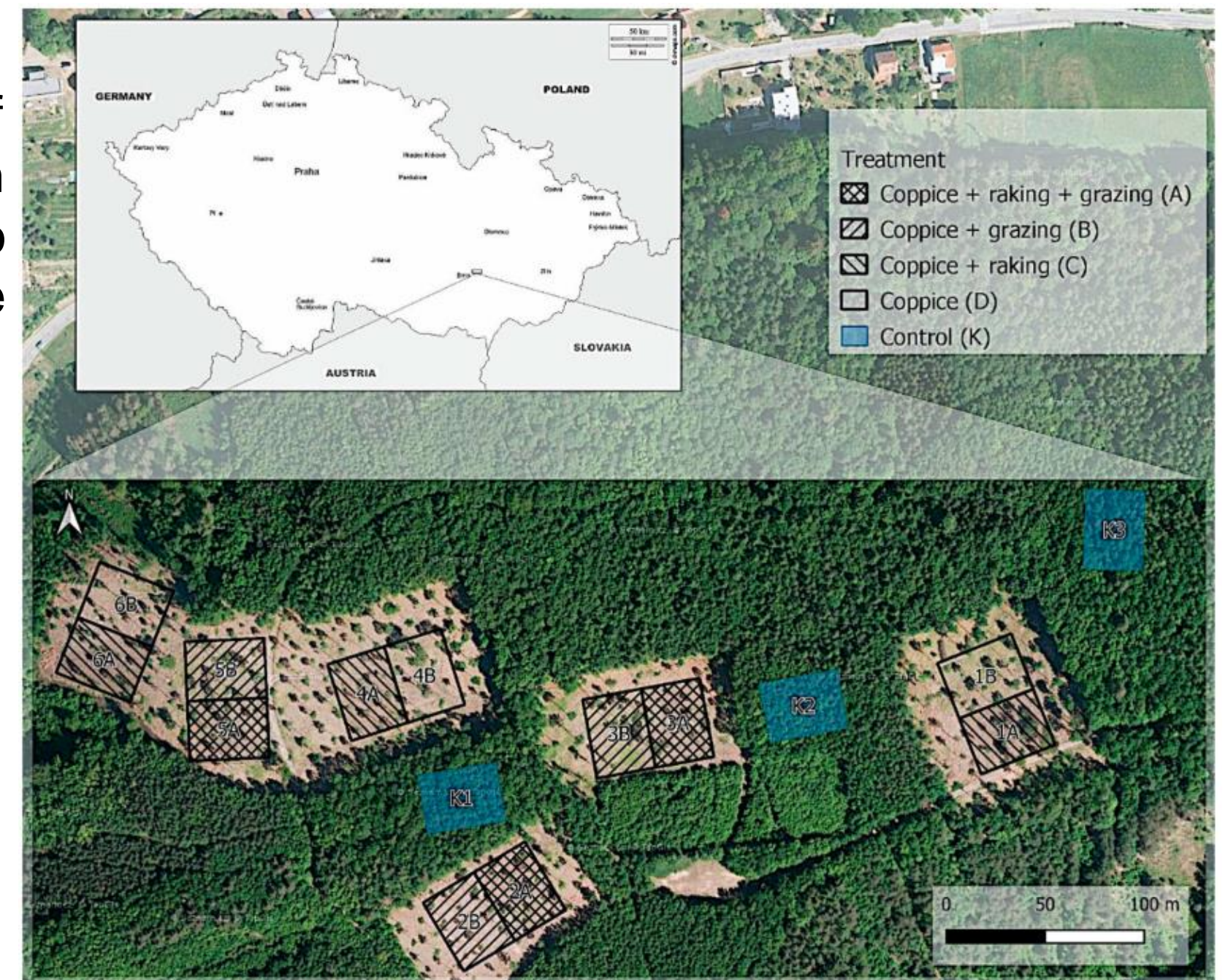


Fig.1 – Location of study plots at locality "Hradisko", Masaryk's Forest Křtiny



Fig.2- Research area-Grazing and litter raking



Fig 3- Sampling of the organic soil horizon

RESULTS

As mentioned earlier, the focus of the results will primarily be on pedological properties. We conducted a comparison of various soil characteristics under different traditional management methods, and our findings revealed substantial disparities in carbon stocks. The control plots exhibit the highest values, with an average carbon stock of 33.18 t/ha. In contrast, the thinned-raked-grazed plots show the lowest average values, with a carbon stock of 27.74 t/ha (Kostka, 2022). The measurements of the overlying organic horizon yielded the following results: at the start of the experiment, the readings ranged from 4.71 to 4.04 cm. However, in 2021, the values exhibited significant variation. The lowest measurements were observed in the thinned-raked-grazed and thinned-grazed plots, with values of 1.5 cm and 1.54 cm, respectively (Kostka, 2022). The amount of litter on the research plots ranges from 4.13 to 3.23 t/ha. The highest values are for control plots at 7.6 t/ha (Kostka, 2022). When examining the Ah horizon, the values in 2021 were found to be higher than those in 2017 (Kostka, 2020), with one exception being the control plot. The highest recorded value for the Ah horizon in 2021 was 12.7 cm, and this was observed in the thinned-raked plots (Kostka, 2022).

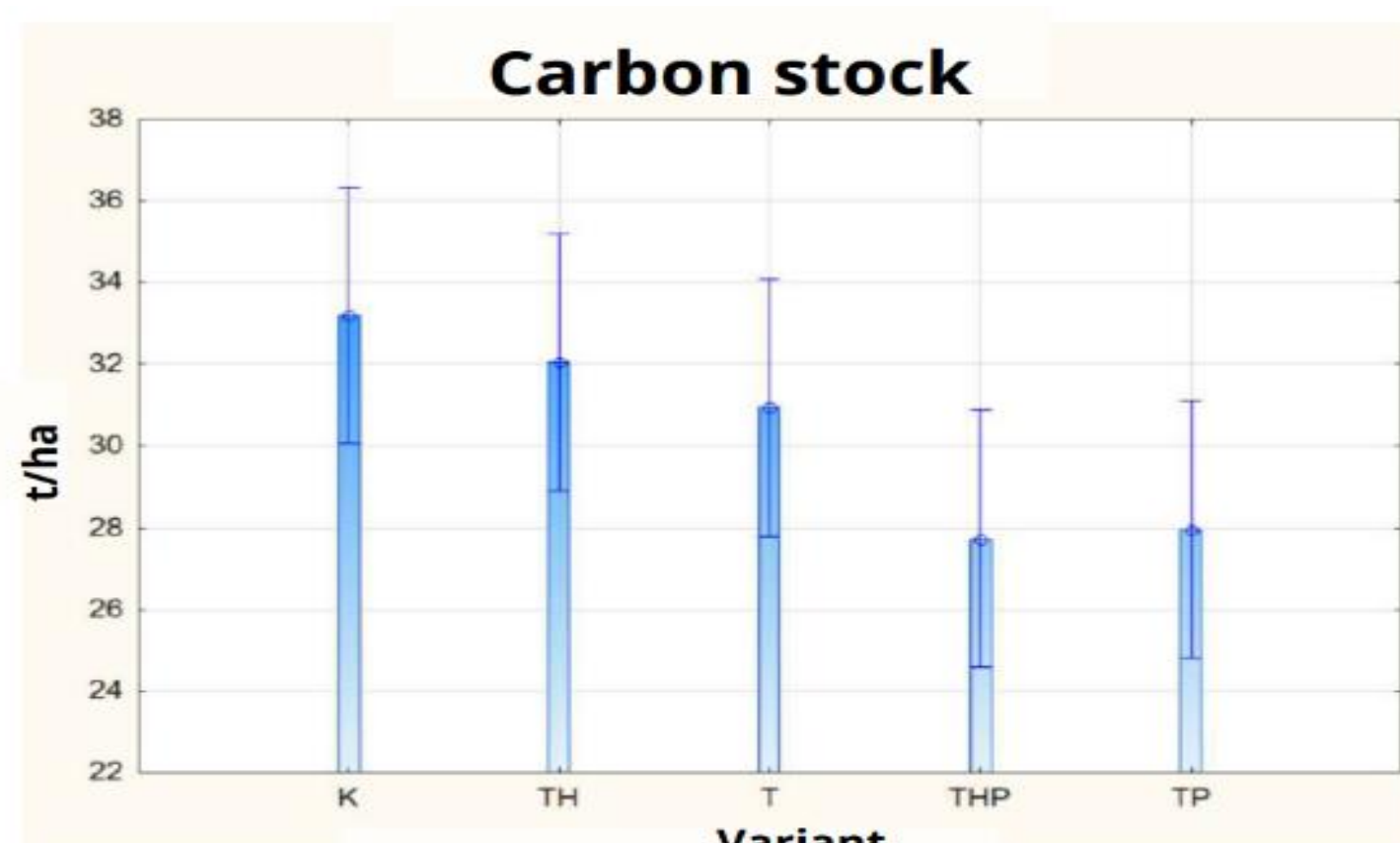


Fig.4 -Mean values of carbon stock in years 2021 between different variants.TH - coppicing and litter raking; T- coppicing; TPH - coppicing, grazing and litter raking; TP - coppicing and grazing; K- control plots

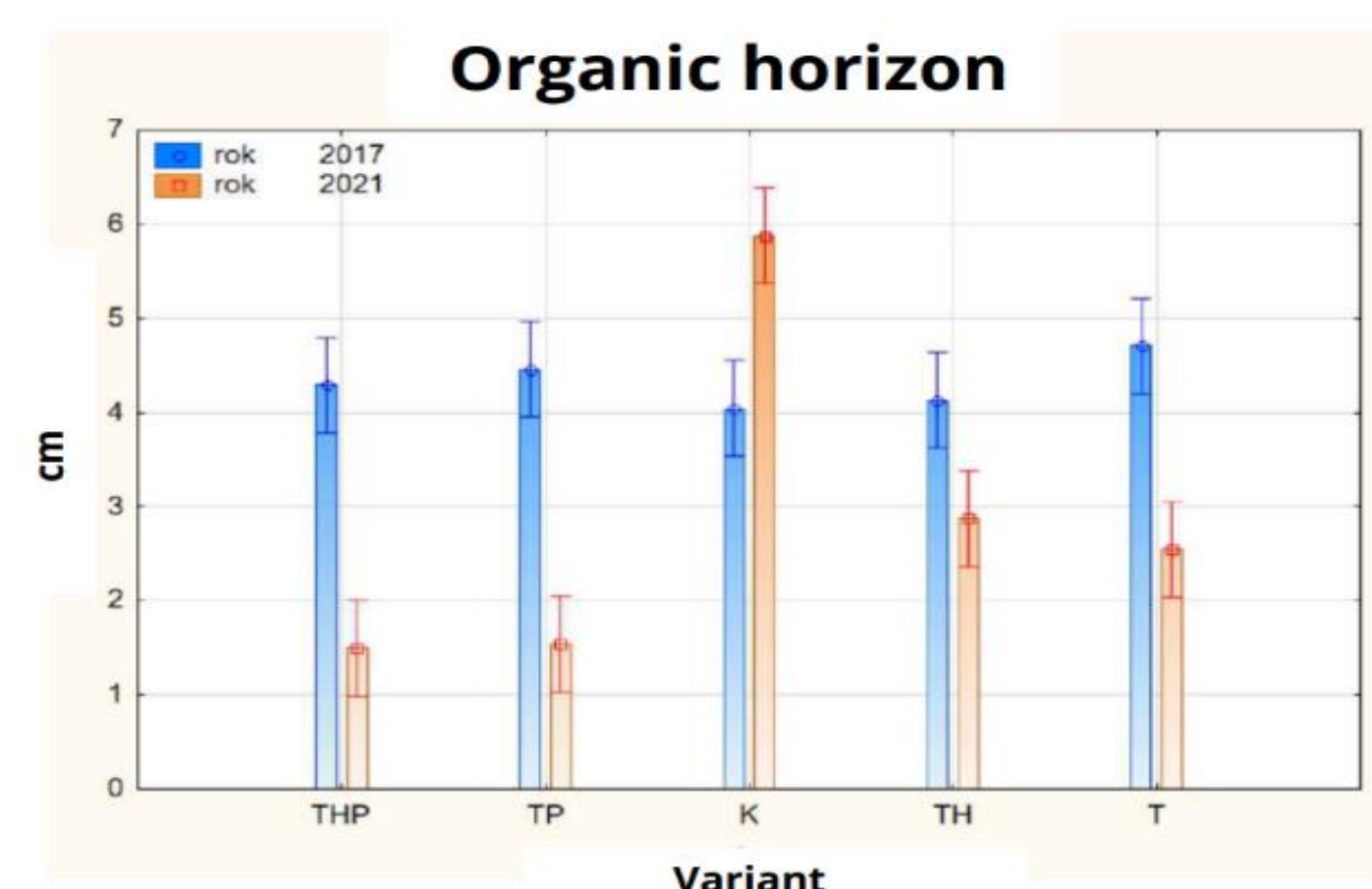


Fig. 5- Amount of overlying organic horizon stock in years 2017-2021 between different variants.TH - coppicing and litter raking; T- coppicing; TPH - coppicing, grazing and litter raking; TP - coppicing and grazing; K- control plots

REFERENCES

KOSTKA, M. 2022. Půdní prostředí v tradičních lesnických managementech po převodu lesa vysokého na les střední ve vztahu k dendrometrickým charakteristikám porostu [online]. Brno. Master thesis. Mendel University in Brno. Supervisor: Ing. Aleš Kučera, Ph.D.

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