

## **The changes of the forests dendroproduction in the Carpathian basin - case study: *Quercus petraea***

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There are a lot of publications about the accelerated forest growth in West-and North- Europe due to global climate change, elevated atmospheric carbon-dioxide and nitrogen input. However, in Central-Europe the increasing tendency of extremely dry periods caused mass mortality of forest formed tree species, and triggered slower or indefinite growth trends. In this study our scientific questions were the followings:

- Which are the characteristic mechanism in the south-east part of Central -Europe: forest decay, accelerated growth or both?
- What are the expected impacts of climate change on sessile oak production?
- Are there any differences between a humid and an arid landscapes tree height growth?

Method for measuring the changes of growth in humid landscapes:

Top height of the stands is a good indicator of the site condition with high stand density. So this indicator can be used to measure the changes of growth in humid stands, where the drought periods caused not considerable tree decay. We have been measured a young and old sessile oak stands next to each other along a humid-arid climatic transect in Hungary. The old stands representing the “pre-climate change” conditions, when the annual temperature means, and the frequency of droughts were lower. The young stands have been lived their whole lifetime in changed atmospheric condition. Compared the top height of the young and old stand to the yield tables we can establish a soft accelerated growth in the last decades in the humid landscapes.

Method for measuring the changes of growth in dry landscapes:

Top height of thinned forests due to tree decay do not indicate the changed atmospheric condition. Although the volume of the survived trees has been increased (compared to yield tables) due to accelerated diameter growth, the production of the thinned *Quercus petraea* forests have been decreased.

Keywords: tree height growth, nitrogen input, humid-arid climatic transect

Acknowledgements: Research is supported by the ÚNKP-16-3-3 New National Excellence Program of the Ministry of Human Capacities and the “Agroclimate.2” (VKSZ\_12-1-2013-0034) EU-national joint funded projects.