THE EFFECT OF INTERSPECIFIC COMPETITION OF OAK AND BEECH IN THE THIRD AND FOURTH FOREST VEGETATION ZONES UNDER THE INFLUENCE OF GLOBAL CHANGE

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PROJECT GOAL

The main objective of this project is to analyze and evaluate the resistance, sensitivity and growth of monocultures and mixed stands Sessile oak and European beech under influence of climatic change.

INTRODUCTION

Ongoing climate change causes an increase in the average air temperature and a changing temporal and spatial distribution of precipitation. This increases evapotranspiration demands and leads to gradual vegetation change across ecosystems worldwide (Gonzales et al., 2010). On a regional scale, the impact of climate change on vegetation is best observed in the shift in forest vegetation zones (hereinafter referred to as FVZ) (Čermák et al., 2021). According to Machar et al. (2017), due to climate change, there will be an increase in the spread of lower FVZ in the territory of the Czech Republic and their shift to higher altitudes. The ambiguity in the shift of FVS is the processes of interspecies competition, different phenotypic plasticity and different adaptability of dominant species in individual FVZ (Iverson, McKenzie, 2013). Drought then increases the risk of mortality and changes ecohydrological relationships (Adams et al., 2012). Boisvenue and Running (2006) state that the amount, availability, but also the distribution of water during the year, together with temperature, represent the basic limiting climatic factors for the spread of herbaceous and woody vegetation, their species structure, as well as production on Earth. It

CONCLUSION AND DISCUSSION

Considering the initial phase of the project's data evaluation, it can be concluded that the DBH of target tree depends on competition index. This is evidenced by preliminary data presentation in Figures 1 – 2. Target trees of oak as well as beech show similar proportion between their CI and DBH in monoculture stands. The beech and oak in the mixture has a height DBH than in the pure stand with the same value of the CI. The CI values are slightly higher for oak in the pure stand than in the mixed stand. Beech has a lower CI in the mixture than in the pure stand.

MATERIAL AND METHODS

Research circular plots with a size of each 0.5 ha, have been established at the University Forest Enterprise Masaryk Forest of Křtiny in the fourth vegetation zone. Were selected a total of 4 groups for the categorization of evaluated individuals:

1) Beech in competition with beech
2) Beech in competition with oaks
3) Oak in competition with beeches
4) Oak in competition with oaks

The selected trees on plots were targeted by FieldMap, a dendrochronological analysis was performed and a competition index was determined for them to express interspecific competition. Calculate the competition index according Heigy (1974): $CI = \sum_{j=1}^{n}\left(\frac{DBH_j / DBH_i}{DIST_{ij}}\right) \times w_n$

where CI = total competition index of the target tree, DBHj = stem diameter of competing tree, DBHi = stem diameter of target tree, DISTij = distance between target tree and competing tree, n = 5 competing trees, wn = 1 - mortality was not considered

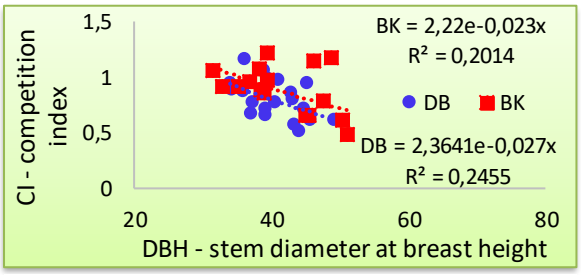

Fig. 1 - -Graph of the dependence of comtetition index (CI) on the target stem diameter at the breast height (DBH) in pure stands of European beech (BK) and Sessile oak (DB).

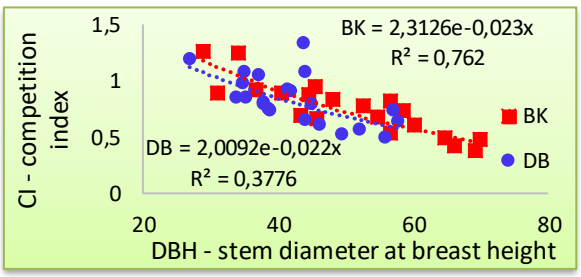

Fig. 2 - Graph of the dependence of comtetition index (CI) on the target stem diameter at the breast height (DBH) in mixed stands of European beech (BK) and Sessile oak (DB).

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