

COMPARISON OF NATURAL REGENERATION OF SESSILE OAK (*QUERCUS PETRAEA*) IN STANDS WITH DIFFERENT REGENERATION MANAGEMENT

Žižková Eliška¹, Martin Kománek¹, Jakub Černý^{1,2}

¹Mendel University in Brno / Faculty of Forestry and Wood Technology

²Forestry and Game Management Research Institute, Strnady

e-mail: eliska.zizkova@mendelu.cz

Keywords: Oak seedling * shelterwood * clear cut * root system * seedling parameters * biomass allocation

PROJECT GOAL

The aim of the project was compare parameters of oak natural regeneration on shelterwood and clear-cut.

INTRODUCTION

Global climate change (GCC) causes an increase in the frequency of extreme weather events (Rahmstorf and Coumou 2011). GCC is manifested through the weather, mainly through overall warming, which is particularly evident in the winter months. The distribution of precipitation throughout the year is also changed, and rainfall tends to be more torrential (Vinš 1996). Oaks are less climatically vulnerable tree species and represent an integral part of the native tree species composition in the Czech Republic. Thus, GCC may substantially favour oaks over other tree species (Novák et al. 2017). Sessile oak (*Quercus petraea*) is considered a light-demanding tree species with a short regeneration period that naturally regenerates successfully (Indruch 1985). Currently, there is a greater inclination of the forestry community towards natural regeneration. The application of the regeneration approach is seen as an essential element of close-to-nature forestry (Vacek et al. 2010). Although sessile oak has good prerequisites for natural regeneration, it requires certain peculiarities in the regeneration process (Peňáz 1999).

METHODS

As part of the FTE Křtiny, seven forest stands were selected for sampling the natural regeneration of the sessile oak. Samples were collected in clear-cut and shelterwood representing a total of 7 variants. At each selected variant, 50 individuals were sampled using a spade, resulting in a total of 531 individuals collected (only 31 individuals were collected perat one site due to abundance). For the collected individuals, the following parameters were first measured: total height (0,1 cm), root collar thickness (0,01 mm), root length (0,1 cm), and aboveground length (0,1 cm). After measuring, the individuals were placed in an oven and dried at a temperature of 105 °C for 12 hours. Upon completion of the drying process, the dry weights of leaves, coarse roots, and stems were subsequently measured (0,001 g).

RESULTS

Fig. 1 shows the differences in aboveground biomass between shelterwood and clear-cut. It shows that the amount of biomass is significantly higher in clear-cut. This difference may be due to more favourable conditions for the natural regeneration of oak, primarily because of better access to light and nutrients.

Fig. 2 shows the root length in different variants and indicates that root length is greater in clear-cut. This may suggest that the natural conditions in these areas support the development of the root system, which can positively affect the overall vitality of natural oak regeneration.

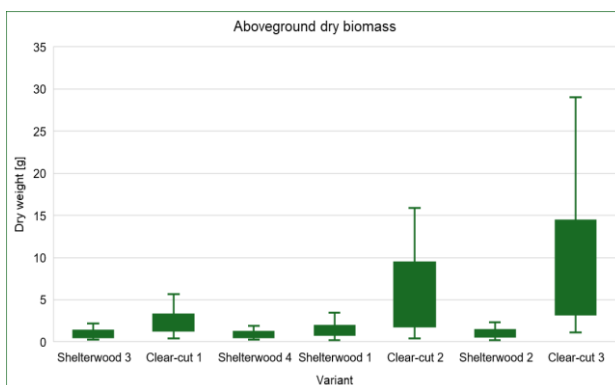


Fig. 1 – Total aboveground dry biomass of oak natural regeneration

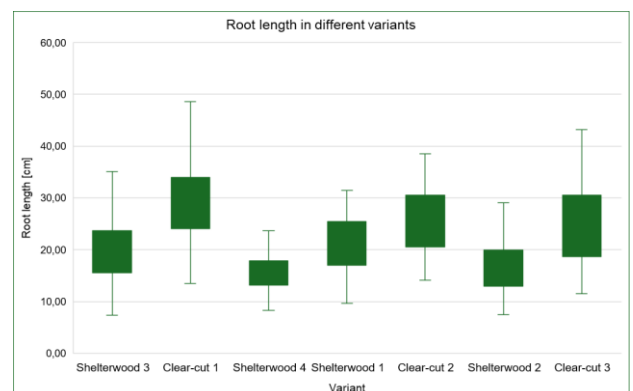


Fig. 2 – Root length of oak natural regeneration in different variants

REFERENCES

- INDRUCH, A. 1985. Zakládání a výchova listnatých porostů: zkušenosti a poznatky získané při zakládání a výchově listnatých porostů v podmínkách Bílých Karpat. Praha: Státní zemědělské nakladatelství. 142 p.
- NOVÁK, J. et al 2017. Využití dubů při adaptaci lesů ČR na změnu klimatu: pěstování a hospodářská úprava lesa. Strnady, Lesnický průvodce, 11/2017.49.
- PEŇÁZ, J. 1999. Přirozená obnova dubu. Lesnická práce, 78(9).
- RAHMSTORF, S., COUMOU, D. 2011. Increase of extreme events in a warming world. Procdings of the National Academy of Sciences, 108(44), 17905-17909.
- VACEK, S. et al 2010. Regeneration of forest stands on permanent research plots in the Krkonoše Mts. Journal of Forest Science, 56, 2010 (11): 541-554.
- VINŠ, B. 1996. Dopady možné změny klimatu na lesy v České republice. Národní klimatický program ČR. Praha, ČHMÚ,19.135.

ACKNOWLEDGEMENT

The contribution was founded by Internal Grant Agency MENDELU, FFWT-24-IP-010.

ldf.mendelu.cz