

BOOK OF ABSTRACTS

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TOWARDS 2050



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Promoting species diversity: understanding Sweet chestnut within regeneration of Scots pine stands

T2.26 Silviculture for the Bioeconomy and Ecosystem Services in Castanea Forests

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Abstract: Pine forests show a natural gradual transition to mixed plantations where, with the progression of ecological succession, hardwoods such as Sweet chestnut (*Castanea sativa* Mill.) and oaks begin to progressively settle. However, the persistence of chestnut in conifer stands remains poorly studied and appears to be strongly influenced by the surrounding areas where the species is cultivated and light availability. In this case study conducted in Serra da Nogueira, Portugal, which is characterized by a mosaic of habitats resulting from mountain agriculture, including extensive Pyrenean oak forests and stands of other hardwoods and conifers, such as Scots pine (*Pinus sylvestris* L.), it was observed that chestnut persisted in the natural regeneration of these stands primarily due to the presence of nearby chestnut forests and agroforestry stands. The presence of advanced regeneration in the understory of Scots pine stands suggests that chestnut can persist in the natural regeneration dynamics, leading to the formation of mixed stands more resilient and biodiverse. Therefore, the regeneration status of two Scots pine stands covering a 12-hectare area in Serra da Nogueira (41°45'34"N, 6°54'53"W, altitude 980 m) was assessed. A systematic sampling approach was applied. A semi-permanent circular plot device was installed, following a concentric system with a fixed radius. Natural regeneration ($d < 10$ cm) was divided into two height strata: up to 2 m and > 2 m. Concentric circular plots of 100 and 200 m² were used to study each height stratum. Abundance and diversity were evaluated using modified Shannon and Simpson indices, the inverse of the Berger-Parker index, and species richness. Generalized linear models (GLM) and generalized additive models (GAM) were employed to explore the influence of potential explanatory variables related to stand structure, crown cover, and degree of shrub cover (SC) on the abundance of the main species contributing to natural regeneration. The results indicate that basal area (G) significantly affects the abundance of natural regeneration. Additionally, it was found that the percentage of SC also had an influence. Basal areas close to 40 m² ha⁻¹ promote the regeneration of Scots pine while lower G favors the establishment of hardwoods, particularly chestnut.