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Tipiditappi



*Sughero d'albero fatto a pezzetti,
tipi di tappi , quelli che vuoi.
Tagliali lunghi, tagliali stretti,
tipi di tappi, fatti da noi.
Taglialo bene, taglialo tondo,
tipi di tappi, quanti ne vuoi.
Tappi di sughero per tutto il mondo,
tipi di tappi fatti da noi.*
(Cecchi-Tognolini, Filastrocche e Canzoni)

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ORAL PRESENTATION

Session 3: *Multifunctionality of cork oak systems, biodiversity, climate change mitigation and landscape/ecosystem services*



BIOMASS AND ALLOMETRY OF CORK OAK TREES GROWING UNDER DIFFERENT LAND USES IN SILVO-PASTORAL ECOSYSTEMS

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Cork oak (*Quercus suber* L.) trees are an important component of different land use types (LUT) in the silvo-pastoral ecosystems of northeastern Sardinia. Land use types differ in the density of cork oak and thus in the cork oak contribution to the ecosystem carbon budget. Differences in tree density also affect the allometry of the cork oaks and the cork productivity per tree and land unit. Quantifying biomass and modeling tree allometry is important to assess the ecosystem services provided by these trees in each LUT. This study focuses in three LUT: woodlands (W), wooded grasslands (WG), and open grasslands (OG). Four sites were selected with three sites having all three LUT and one site having only W. Systematic sampling with fixed-area plots was conducted in the summers of 2015 and 2016. In each plot, all trees above 5 cm in diameter at breast height (dbh) were measured. The tree attributes dbh, total tree height (HT), crown diameter (CD), debarking height, forking height, and bark width at several tree heights were measured. Above ground biomass (AGB) per tree and per hectare were estimated using published allometric equations. An analysis of variance was conducted to test whether AGB in cork oak trees differ by LUT. Linear and nonlinear mixed effects models were used to model the following allometric relations: HT-dbh, CD-dbh, and crown area-dbh. Models predicting bark volume were developed using different predictor variables. AGB in cork oaks in the OG was significantly lower than the AGB in the W and WG (mean AGB values of 3 t/ha, 49 t/ha and 26 t/ha respectively; $\alpha=0.05$), whereas the AGB in W and WG was not statistically different due to high spatial variability in AGB in the W. Allometric models had a good fit with root mean square values of approximately 25% of the mean of the predicted variable. These models provide reliable estimates in areas similar to those sampled and will allow estimating the contribution of the tree component in the carbon budget of the studied silvo-pastoral systems.

Keywords: cork oak, biomass, allometric equations, bark volume, height-diameter