

ORAL PRESENTATION

Biomass Equations for Natural *Pinus Nigra* Arnold. Trees in Kızılcahamam

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Introduction: Biomass studies are needed to make true estimates of carbon stocks. Allometric equations developed using independent variables such as tree diameter, height, specific weight, which can be easily measured in the field, are linear or nonlinear regression equations. In this study, belowground and aboveground biomass equations of Kızılcahamam region natural pine stands were determined.

Material and Methods: A total of 34 sample trees were measured in various diameter and height groups in Kızılcahamam Forest Enterprise. Using the data obtained from those individuals, the biomass values of tree components were calculated. The study tested different models in determining biomass as a function of DBH or DBH and H. The models were selected as best-fit models according to different criteria.

Results: The models make it possible to estimate the biomass values of aboveground and belowground tree components from diameter at breast height and independent variables of diameter at breast height ($d_{1,3}$) – tree height (h). Models using DBH and H as independent variables show stronger relationships than models using DBH as independent variable.

Some models that use DBH as independent variable:

Single-Tree Biomass Equations:	R ²	F	S _e
WAB = 25.2346 + (-5.8687d _{1,30}) + (0.5188d _{1,30} ²)	0.86	93	137
lnWBB = -4.0720 + (2.2100 ln d _{1,30})	0.90	300	0.39

Some models use DBH and H as independent variables:

Single-Tree Biomass Equations:	R ²	F	S _e
WAB = 106.6611 - 11.5098d _{1,30} - 11.481h + 0.5972d _{1,30} ² + 0.7758h ²	0.86	45	139
lnWBB = -10.8345 - 2.557ln d _{1,30} + 0.7068ln d _{1,30} ² + 11.4013ln h - 2.1988ln h ²	0.92	85	0.37

WAB: Whole aboveground biomass, WBB: Whole belowground biomass

Discussion: According to the comparison made with afforestation of black pine by Güner ve Çömez (2017); afforestation areas have more needle leaf and below ground biomass, while natural stands of the same diameter are seen to have higher body weight. Up to 30 cm DBH, total aboveground biomass is very close to each other. Although harvesting and weighing a tree's biomass directly in the field is the most accurate method, it is a time-consuming and destructive application. The use of allometric relationships rather than direct harvesting in determining biomass is a frequently preferred non-destructive and indirect method. It is also less time-consuming and cheaper.

Keywords: *Pinus nigra*, biomass, allometry