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The effect of the density of the forest and age on the amount of carbonic stock of *Pinus brutia* Ten.

Authors:
Afaq Ibrahim Jumaa Al-Jibouri[1], Mohammed Younis Saleem Al-Allaf[2] and

Institution:
1. College of Agriculture and Forestry, University of Baghdad, Iraq.

2. College of Agriculture and Forestry, University of Mosul, Iraq.

Corresponding author:
Afaq Ibrahim Jumaa Al-Jibouri

ABSTRACT:

This study was conducted on *Pinus brutia* Ten. in Zawita region northern Iraq, which located between latitude (36°43′-36°54′) and longitude (43°02′–44°00′) and altitude ranging (681-1014) m above the level sea. The search method of data collection depended on the ground inventory done in summer 2010, where all basic data of the study were collected, which represented the variable of tree and forest from 30 samples. The layered random stocktaking was used to this effect, and it was divided into two layers. Twenty samples taken form artificial plantation and ten samples from natural forests were distributed to the study region with dimensions (30x30). Then from each sample, the measures of diameter at the Breast Height (DBH) and the variables of the forest represented by the number of trees per unit area and average square diameter and prevailing average height of trees. By using the mathematical models, the size of the trunk and branches was estimated, and from the specific weight of *Pinus brutia* Ten. of about (0.4676) kg/m^3, the weight of trunk and branches of the study sample was calculated, also the weight of wet leaves was calculated from the study site for different diametrical categories of samples, by using multiple regression data field for trunk, branches, leaves and forest variables, were calculated using the following equations:

$WDS=-1314.2 + 67.564N + 413.13dq + 592.838\ Hm$

$WDB = 893.88 + 2.10712dq^2 + 1.0NHm^{1.2667}$

$WDL = 138.26 + 0.2958dq^2 + 0.64491\ NHm^{0.7456}$

Through these equations, we could estimate the molecular weight of the different dried tree elements represented by (trunk, branch, leaves), which represents the dry mass of the tree per unit area, and by combining these elements, we can obtain the total dry mass per unit area, and the change occurred in the forest in terms of tree number per unit area, the prevailing average height, or the average square diameter that leads to significant changes in the total dry weight above ground.

Keywords:

Forest density, *Pinus* sp, Carbon stock, Biomass production, Bioenergy.

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