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A. Durkaya , B. Durkaya & S. Atmaca

To cite this article: A. Durkaya , B. Durkaya & S. Atmaca (2010) Predicting the Above-ground Biomass of Scots Pine (*Pinus sylvestris* L.) Stands in Turkey, Energy Sources, Part A: Recovery, Utilization, and Environmental Effects, 32:5, 485-493, DOI: [10.1080/15567030802612473](https://doi.org/10.1080/15567030802612473)

To link to this article: <https://doi.org/10.1080/15567030802612473>



Published online: 29 Dec 2009.



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# Predicting the Above-ground Biomass of Scots Pine (*Pinus sylvestris* L.) Stands in Turkey

A. DURKAYA,<sup>1</sup> B. DURKAYA,<sup>1</sup> and S. ATMACA<sup>1</sup>

<sup>1</sup>Zonguldak Karaelmas University, Faculty of Forestry, Bartın, Turkey

**Abstract** *In this study, biomass equations are presented for scots pine stands within the Erzurum Regional Forestry Management Area. Thirty-three sample plots, each of 0.04 hectares were chosen in order to define the biomass equations of black pine, one of the common needle-leaved species in Turkey. A tree that is the most similar to mean tree according to basal area was cut in each sample area as a sample tree. Various models were tested, utilizing the diameter (d) and the height (h) as independent variables, and the most suitable models were determined. Using these models, above-ground biomass amounts can easily be acquired for single trees and stands.*

**Keywords** above-ground, biomass, Scots Pine, Turkey

## Introduction

Biomass or biological mass comprises the total mass of organic plant matter growing and developing through photosynthesis within a unit area. In the forestry sector, the definition of biomass is understood as the total mass of the trees and shrubs contained in a definite forest area. Biomass in unit area is defined as fresh or oven-dry weight (kg or ton). The moisture content depends on tree species, growing environment, cutting period, and climatic conditions etc. Moreover, moisture content differs in lower and upper parts of a vertical cross-section, and horizontal cross section of a tree. Differences in moisture content are also observed between early and summer wood, and between branch wood and heart wood. For these reasons, dry weight values are preferred to fresh weight values, and are the commonly utilized measure of biomass.

The main aim of carrying out biomass studies in the past was to produce data for renewable energy resources in place of non-renewable energy resources, such as fuel oil and natural gas (Alemdağ, 1981). Since forests can store solar energy via green mass, they are one of the most obvious sources of sustainable energy. Substituting biomass in place of fossil fuels is strongly recommended as one of the most effective means of reducing carbon dioxide (CO<sub>2</sub>) emissions (Schlamadinger and Marland, 1996; Eriksson and Berg, 2007). In terms of estimating the energy that forest biomass can provide from various tree species and determining the whole production amount that can be provided by stands, weight tables were considered to be more effective than volume tables, and biomass tables were prepared as part of previous studies.

Address correspondence to Ali Durkaya, Zonguldak Karaelmas University, Faculty of Forestry, Bartın 74100, Turkey. E-mail: alidurkaya@hotmail.com