Tropentag, September 9-11, 2020, virtual conference

"Food and nutrition security and its resilience to global crises"

Validation of the X-ray Densitometry Method for Wood Density Determination of Acacia seyal Tree Species

Hanadi Mohamed Shawgi Gamal[1], Haytham Hashim Gibreel[2]

[1] *University of Khartoum, Fac. of Forestry; Forest Products and Industries, Sudan*
[2] *University of Khartoum, Forest Silviculture, Sudan*

Abstract

Wood density is a variable influencing many of the technological and quality properties of wood. It is its single most important physical property. Determining the wood density values is important for its end use. The X-ray technique, traditionally applied to softwood species to assess the wood quality properties, due to its simple and relatively uniform wood structure. In the other hand very limited information is available on the validation of using this technique for hardwood species. The suitability of using X-ray technique for the determination of hardwood density has a special significance in countries like Sudan where only a few timbers are well known. this will not only save the time consumed by using the traditional methods but it will also enhance the investigations of the great number of the lesser known species, the thing which will fill the huge gap on information of hardwood species growing in Sudan.

The current study aimed to evaluate the validation of using the X-ray densitometry technique to determine the wood density of *Acacia seyal* var. *seyal*. To achieve this aim, a total of thirty trees were collected randomly from four states in Sudan. The wood density was determined using the air dry gravimetric method as well as the X-ray densitometry method in order to assess the validation of X-ray technique in wood density determination.

The results reveal no significant differences between the values obtained by the two methods. These results confirmed the validation of using the X-ray technique for *Acacia seyal* var. *seyal* density radial trend determination. It also promotes the suitability of using this method for other hardwood species.

Keywords: *Acacia seyal* var. *seyal*, wood density, x-ray densitometry

Contact Address: Hanadi Mohamed Shawgi Gamal, University of Khartoum, Fac. of Forestry; Forest Products and Industries, Alemarat Street 61, Khartoum, Sudan, e-mail: hanadishawgi1979@yahoo.com