

## Article

# A Qualitative Assessment of the Specific Woody Biomass of Fruit Trees

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**Abstract:** In the current context of environmental requirements, solid renewable biomass is becoming one of the main viable energy sources that can replace fossil fuels. This paper focuses on evaluating the morphological structure and properties of three fruit trees that are widely grown on the territory of Moldova, both on the left and the right banks of the Prut River: the apricot, the peach, and the plum. The wood biomass was characterized by scanning electron microscopy (SEM Quanta 200 3D), X-ray analysis (Xpert PRO MPD), and FT-IR analysis. A chemical analysis including the determination of extractive substances, lignin content, and the detection of hemicelluloses content was carried out for all wood samples. In addition, the net calorific value was determined by measuring the calorific value at constant volume, in compliance with the requirements of the EN ISO 18125:2017 standard. According to the obtained results, in terms of maximum calorific output and lignin and minimum ash content, plum appeared to be the best solid biomass resource. However, the other two trees also showed promising results for becoming important sources of wood biomass for pellet production.

**Keywords:** vegetal biomass; apricot; peach; plum; morphological analysis; SEM analysis; XRD analysis; FTIR; calorimetric analysis



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## 1. Introduction

Nowadays, in EU countries the necessity of industrial heat is still mainly obtained from fossil fuels. The demand for renewable energy sources is increasing. The main renewable energy source for industrial heating is solid biomass. A recent study by Malico et al. [1] analyzed the available solid biomass feedstock. The paper emphasized that there is now a balance in Europe between biomass production and consumption, but warned about the necessity of monitoring and sustaining biomass production.

Considering the shear of solid biomass in the Gross Energy Final Consumption (GEFC) index, Romania was at the top of the index in 2018, with 13.9%, immediately after Baltic and Scandinavian countries, Croatia, and Austria [2,3].

Solid biomass for energy purposes can be produced from [1]:

- (a) Residual organic matter resulting from forests and uncultivated lands;
- (b) Energy crops;
- (c) Wastes and residues produced in industrial, agricultural and forestry activities;
- (d) Municipal wastes.

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