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Assessment of biomass bulk elastic response to consolidation

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Graphical abstract



Highlights:

- Investigating methodology and apparatus for evaluating biomass compaction/dilation
- Three different sizes of cylindrical test apparatus investigating uniaxial compaction
- Springiness/hysteresis experiments and modelling of elastic, elongated and entangled fibres
- Study included biomass varieties sugarcane bagasse, wattle and wheat straw

ABSTRACT

The value and variation in bulk density is highly influential in the economics associated with biomass valorisation. Due to its importance, increased feedstock demand is directly related to understanding the characteristics affecting bulk density and the design of biomass processing and handling systems, along the renewable resource supply chains.

This paper presents assessment of the elastic response of sugarcane bagasse, wheat straw and wattle, sourced from a second generation lignocellulosic ethanol plant. The study includes testing bulk solids “springiness” and the strain response to stress. While the results of this paper are a preliminary study, the ultimate aim of this work is to establish a relationship between

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