ABSTRACT FOR A PRESENTATION AT THE RENEWABLE MATERIALS CONFERENCE 2025

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Title: How to quantify the impact biodegradable materials can have?

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Abstract: (approx. 1/3 page)

The use of plastics inevitably leads to (micro-)plastics entering and accumulating in the natural environment, affecting biodiversity, food security and human health. Currently, a comprehensive and universally applicable methodology to quantify microplastic accumulation in the natural environment is lacking, which undermines the impact biodegradable polymers can have.

In this presentation we will present the work we are doing at Wageningen Food & Biobased Research on predictive modelling to examine and compare the microplastic formation and accumulation of different polymer types in diverse natural environments

We will show how the model is used to effectively connect experimentally obtained biodegradation data with sustainability assessments such as LCA by incorporating (the prevention of) plastic pollution in the calculations. This way, the sustainability profile of biodegradable materials and products is better represented and a fair comparison with fossil non-biodegradable counterparts is possible. This also allows for quantitative statements about when biodegradation makes sense in applications and when recycling is the more logical option.

Several case studies will be presented demonstrating the use of modelling results to guide material selection in product design and integrating biodegradability and accumulation potential in the circular design of biobased and biodegradable products.