Improving the energy balance of grass-based anaerobic digestion through combined harvesting and pretreatment - DTU Orbit (08/12/2018)

Improving the energy balance of grass-based anaerobic digestion through combined harvesting and pretreatment

An important challenge that has to be addressed to achieve sustainable anaerobic digestion of lignocellulosic substrates is the development of energy and cost efficient pretreatment methods. Technologies orientated to simultaneously harvest and mechanically pretreat the biomass at the field could meet these criteria as they can potentially reduce the energy losses. The objective of this study was to elucidate the effect of two full-scale harvesting machines to enhance the biogas production and subsequently, improve energy balance. The performances of Disc-mower and Excoriator were assessed on meadow and cultivated grass silages. The results showed that relatively high methane production can be achieved from meadow and cultivated grass harvested in different seasons. The findings indicated that the bioenergy production can be improved based on the selection of the appropriate harvesting technology. More specifically, Excoriator, which cuts and subsequently applies shearing forces on harvested biomass, enhanced the methane production up to 10% and the overall energy budget was improved proportionally to the driving speed increase.

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