

Technology is key for biofuel success

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To make the conversion of biomass to biofuels more cost-effective, new technologies are essential, according to Dr. Richard Hess from the Idaho National Laboratory in Idaho Falls in the US and his team. Their cost-analysis(1) of the steps involved in the corn stover* supply chain is published in Springer's journal *Cellulose*, in a special issue dedicated to technological advancements in the conversion of corn stover to biofuels.

The United States is increasing the use of lignocellulosic biomass, of which corn stover is a substantial source, as part of its portfolio of solutions to address climate change issues and improve energy security. As biorefining conversion technologies become commercial, major barriers to the availability of corn stover for biorefining are emerging, including feedstock availability, supply system logistics and characteristics of the biomass material itself. These barriers challenge the cost-effectiveness of current feedstock logistics systems.

Dr. Hess and his colleagues look at the costs associated with every step of the corn supply system and determine to what extent conventional technologies can make the system more efficient to achieve the feedstock logistics costs target of consuming less than 25 percent of the production cost of biofuels. The authors also identify opportunities and barriers to be addressed in order to achieve cost-efficiency.

The authors show that by simply improving equipment efficiency, without technological changes, the conventional corn supply system design cannot achieve the cost performance goals. Improved technologies and new supply system designs are necessary to address the

challenges posed by the properties of the materials themselves. Changes and improvements in agronomy and crop production are also essential to improve crop residue yields.

These findings are presented as part of a series of articles featured in the August issue (2) of *Cellulose*, edited by Dr. Mike Himmel of the National Renewable Energy Laboratory in Golden, Colorado. This special 17-paper issue covers advancements in the critical technologies important for assessing corn stover biomass conversion to fermentable sugars, which can be converted to fuel ethanol.

"President Obama has highlighted sustainable, alternative fuels as a critical problem to be solved in the US before the end of the decade," Dr. Himmel said. "The new administration has authorized an unprecedented level of investment in research and development for 2010 to find solutions to the transportation fuels challenge. In addition to having the potential of contributing to sustainable transportation fuels in the USA, cellulosic ethanol is a globally recognized path to achieving reductions in greenhouse gas emissions and global warming."

* Corn stover: the stalks, leaves, and cobs that remain after the corn grain is harvested

References

1. Hess JR et al (2009). Corn stover availability for biomass conversion: situation analysis. *Cellulose* [DOI 10.1007/s10570-009-9323-z](https://doi.org/10.1007/s10570-009-9323-z)
2. *Cellulose*, Volume 16, No. 4, August 2009, Special issue: [Corn](#) Stover Conversion to Biofuels.

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