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## Leibniz Ag Engineering Institute develops new biomass technology

By Jon H. Harsch

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Editor's Note: *Agri-Pulse* is participating in an intensive week-long program of visits with German government agencies, renewable energy research organizations, and private companies. For more on the "Role of Green Energy in German Agriculture" tour, see: <http://www.agri-pulse.com/uploaded/20091005H.pdf>.

While President Obama talks about passing climate change legislation to ensure that the U.S. becomes an exporter of renewable energy (RE) technology, Germany is focused on action, not words. The 60 scientists and 40 PhD students at the Leibniz Institute for Agricultural Engineering in Potsdam are helping build a solid national RE research system in close partnership with private industry. The Institute's aim is to ensure that Germany maintains its lead



**Leibniz Institute for Agricultural Engineering Agricultural Engineer Helene Foltan (in tan raincoat) and Scientific Director Prof. Reiner Brunsch (with umbrellas) tell U.S. ag reporters about the Institute's work with the plots of four-year-rotation hybrid poplar and willow in the background. Photo: Agri-Pulse.**

as a developer and exporter of the new technology and equipment needed to improve the economics of energy crops – and improve the rural economy both in Germany and in developing countries around the world.

Prof. Dr. Reiner Brunsch, the Institute’s Scientific Director, explains that one of the Institute’s strengths is that its scientists work closely both with industry and with farmers in developing new technology and new equipment. As an example, to make raising short-rotation poplar and willow plots work for small farmers, the Institute is developing harvesting equipment tough enough to handle thickly planted poplar and willow plots but downsized to fit small farmers’ budgets – and to fit into their equipment sheds. Institute scientists are also testing the storage characteristics of different sizes of wood chips to maximize drying while minimizing damage.

Biogas researcher Dr. Jan Mumme is working on a new methane digester process so uniquely different that it was off-limits for photos. But he did explain the secret of its success: a type of microflora being treated in a special way and so efficient that “We leave them alone and they do their best work.” Because this process does not use typical slurry mixing, which requires electricity to power the mixing blades, overall energy efficiency is improved.



**In one of the Leibniz Institute’s labs, researchers Jörn Budde and Alexander Schattauer in front of bottles of various manure slurry mixtures being tested to maximize methane gas output through using different feedstocks including hog and cow manure mixed with various types and sizes of wood chips, different temperatures, and different enzyme treatments. Photo: Agri-Pulse.**

To feed Germany’s rapidly growing array of 4,100 biogas power plants, Agricultural Engineer Helene Foltan explains that coming up with just the right ingredients to produce biogas is a complex process since “every farm is different.” So, she says, the Institute’s job is not finding one size that fits all – but building a complex inventory of solutions which will maximize biogas production for each farm, custom tailored to each farm’s unique combinations of materials. She says one goal is to give farmers the ability to grow their own enzymes matched to their farm’s unique needs.

Along with his work on biogas digesters, Mumme is also working on biochar which he says offers a proven way to keep carbon “stable in the soil for 1,000 years or longer” while at the same time improving soil fertility.

In another part of the Leibniz Institute’s campus, Dr. Hans-Jörg Gusovius shows off a range of industrial hemp insulation, fiber mats and fiber board, including a thick molded six-panel door made from the hemp grown and processed at the Institute. He explains that in the past, hemp was grown extensively in the area’s poor soils, before it was banned. By the time the Institute began work to reintroduce the crop after it was legalized in 1996, local farmers no longer were familiar with the crop. Now the Institute is developing new technology to improve harvesting, processing and uniform fiber production – and a production chain based on small decentralized processing plants which will bring new jobs to rural areas.



**Dr. Hans-Jörg Gusovius explains the Leibniz Institute’s disk mill developed to improve industrial hemp fiber processing, to revive a crop that once flourished in this region with its poor, sandy soils – a crop with multiple uses for insulation, fiber matting now widely used in auto interiors, and fiber board. Photo: Agri-Pulse.**