

Landscaping Instead of Monoculture

KIT Study: Grass Is an Alternative to Silage Maize in Biogas Production



Potential energy carrier: Grass of meadow orchards. (Photo: Leible/ITAS)

Production of biogas from silage maize booms. But this green energy production also has its drawbacks: Maize monocultures block increasingly large areas for food production and result in a monotonous landscape. So far unused grass from landscaping is an ecological alternative, if economic drawbacks are compensated. This is the result of a recent study of KIT and the University of Hohenheim, which focused on locations in Baden-Württemberg.

Biogas has become a major element in energy production. In late 2014, about 8000 biogas facilities were in operation in Germany. In most facilities, silage maize is used as feedstock. "Further construction of biogas facilities, however, will reach its limits," Dr. Ludwig Leible, expert for the use of renewable resources for energy production at the KIT Institute for Technology Assessment and Systems Analysis (ITAS), says. The agronomist considers the increased cultivation of maize a problem. Silage maize for biogas production increasingly blocks fertile farmland and this may be considered a loss for our cultivated landscape from the esthetic point of view. "As it also requires a large fertilization and crop protection expenditure, we plead for a diversification," the agronomist emphasizes. Material produced by landscaping might be a real alternative. It is abundant

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on meadow orchards or in nature protection zones anyway and contributes to biodiversity and a reduction of landscape monotony.

On behalf of the Baden-Württemberg Ministry of Rural Affairs and Consumer Protection (MLR), ITAS, in cooperation with the State Institute of Agricultural Engineering and Bioenergy of the University of Hohenheim, studied whether grass produced by landscaping measures is suited for biogas production and which additional costs result. Apart from a techno-economic analysis of the complete production chain – from harvest to use at the biogas plant –, technical studies of mechanical substrate treatment and achievable biogas yields were made.

“The findings of our study,” ITAS project head Ludwig Leible says, “confirm that material produced by landscaping measures is suited for biogas production.” Compared to silage maize that presently has a share of about 55% in biogas production in Germany, however, competitive disadvantages exist. According to the study, this is due to smaller hectare yields – harvest and transport therefore take a comparably longer working time – and the smaller specific biogas yields per ton of organic dry matter.

According to calculations of the scientists for two exemplary biogas plants in Baden-Württemberg, competitiveness could be maintained by an additional area payment of about EUR 200 per hectare when replacing 20% of the previous substrate by landscaping grass. “Still, we plead for using material produced by landscaping measures in biogas facilities,” Leible continues, “even though additional subsidies will be required. Use of landscaping grass contributes to preserving meadow orchards and generally enriches the landscape.”

The study “Biogas aus Landschaftspflegegras – Möglichkeiten und Grenzen” (Biogas from Landscaping Grass – Opportunities and Limits, KIT Scientific Publishing, Karlsruhe, KIT Scientific Reports, No. 7691) may be obtained from Karlsruhe Institute of Technology. It is also available online at www.itas.kit.edu/pub/v/2015/leua151.pdf.

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