SESSION / SESSION / SITZUNG 7:
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THE SUGAR BEET AS AN ENERGY CROP IN CROP ROTATIONS ON HIGHLY PRODUCTIVE SITES – AN AGRONOMIC/ECONOMIC SYSTEM ANALYSIS

La betterave sucrière en tant que plante énergétique dans des rotations de cultures de sites hautement productifs – une analyse agronomique/économique du système / Die Zuckerrübe als Energiepflanze in Fruchtfolgen auf hochproduktiven Standorten – eine pflanzenbaulich/ökonomische Systemanalyse

ABSTRACT

The aim of the project is to develop recommendations for a sustainable production of energy crops in diversified crop rotations. Therefore, crop rotations with and without sugar beet (SB) or silage maize (SM) for biogas production are investigated including winter wheat for flour production. Yields, energy input, green house gas emission, pesticide use, N-balance, soil parameters, economic competitiveness, agricultural commodity markets affected, and site-related preferences of the crop rotations are examined in five sub-projects. The dataset is based on four field experiments at three highly productive sites in Germany (2011-2013; Harste, Aiterhofen, Etzdorf). Preliminary calculations showed a potential methane yield of 6,145 Nm^3 ha^{-1} a^{-1} (SB) and 7,616 Nm^3 ha^{-1} a^{-1} (SM), respectively. The agronomic energy input was calculated under several assumptions and substracted from the output resulting in the net-energy yield of 201 GJ ha^{-1} a^{-1} (SB) and 254 GJ ha^{-1} a^{-1} (SM). First estimations of the greenhouse gas intensity of the biomass production were 17 kg CO_{2eq} GJ^{-1} (SB) and 11 kg CO_{2eq} GJ^{-1} (SM). Anyway, these mean values vary strongly depending on sites and crop rotations due to factors like time of harvest or yield decrease in monocultures. Further selected results of the joint project are presented during the congress in the poster exposition (see co-authors named). Although the integrated analyses by all sub-projects are not complete, we suggest at this stage that SB can offer an efficient option to diversify energy crop rotations.