Geophysical Research Abstracts
Vol. 19, EGU2017-4908, 2017
EGU General Assembly 2017

Assessing soil quality and potential productivity – a basic approach to define and assess the marginality of land

Frank Repmann, Werner Gerwin, and Dirk Freese

Chair of Soil Protection and Recultivation, Brandenburg University of Technology Cottbus - Senftenberg, Cottbus, Germany (repmann@b-tu.de)

An ever growing demand for energy and the widely proposed switch from fossil fuels to more sustainable energy sources puts the cultivation and use of bioenergy plants into focus. However, bioenergy production on regular and fertile agricultural soils might conflict with the worldwide growing demand for food. To mitigate or omit this potential conflict, the use of low quality or marginal land for cultivation of bioenergy plants becomes favorable. Against this background the definition and assessment of land marginality and, respectively, the evaluation whether and to which extent specific areas are marginal and thus convenient for sustainable bioenergy production, becomes highly relevant. Within the framework of the EU funded Horizon 2020 project SEEMLA, we attempted to asses land marginality of designated test sites in the Ukraine, Greece and Germany by direct field survey. For that purpose, soil and site properties were investigated and evaluated by applying the Muencheberg Soil Quality Rating (SQR) method, developed at the Leibniz Centre for Agricultural Landscape Research (ZALF). The method deploys a comprehensive set of biogeophysical and chemical indicators to describe and finally evaluate the quality of the soil and site by a score ranging from 1 to 100 points. Field survey data were supported by additional laboratory tests on a representative set of soil samples. Practical field work and analysis of field and lab data from the investigated sites proved the applicability of the SQR method within the SEEMLA context. The SQR indices calculated from the field and lab data ranged from 2 to < 40 and clearly demonstrated the marginality of the investigated sites in the Ukraine, Greece and Germany, which differed considerably in respect to their characteristics. Correlating the site quality index to yield data reflecting yield estimations for common bioenergy plants such as willow (Salix sp.), black locust (Robinia pseudoacacia) and poplar (Populus sp.) cultivated at the respective test sites, revealed that SQR might additionally reflect the potential yield of the investigated sites.