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The impact of diesel pollution on *Miscanthus x giganteus* biomass-two-year pot experiment

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Energy crop *Miscanthus x giganteus* (*Mxg*) is known for its ability to grow in contaminated soils and for its high biomass which can be transformed to various biobased products.

A two-year pot experiment (2019 – 2020) was set to determine impact of diesel pollution on *Mxg* growth and impact of *Mxg* on degradation of diesel pollution. *Mxg* was grown in pots with diesel-spiked soil with different concentrations (2 500 – 50 000 mg/kg dry soil). Four soil samplings (three in 2019 and one in 2020) were carried out. The soil parameters (available nutrients, humus, pH, TOC) and diesel concentration (C_{10} – C_{40} analysis) were monitored. At the end of each growing season the biomass parameters (height and number of stems) were measured. After the second growing season rhizomes and roots weight was also determined. Plant fitness was quantified by measuring of leaf fluorescence. The changes of microbial communities were characterized by phospholipid fatty acids (PLFA) analysis, respiration and enzymatic activities.

Higher diesel concentration affected negatively the growth of *Miscanthus x giganteus*. Biodegradation of diesel followed the first-order kinetics. Achieved half-lives were significantly shorter in pots with developed planted (compared to unplanted control); at low and high diesel concentrations the differences was not significant. Microbial activity was mostly stimulated by diesel concentration, which indicates microbial biodegradation as the key process. The results implicate slight stimulation of biodegradation developed by *Mxg*.