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YIELD-TRANSPIRATION RELATIONS OF SAKHALIN KNOTWEED (*FALLOPIA SACHALINENSIS*) IN A LYSIMETER EXPERIMENT

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*Climate conditions, water and nutrients availability are the driving factors for plant development and production. Transpiration and yield are strongly affected by abiotic stress as water scarcity, nutrient limitations. Determination of yield-transpiration relations is essential for a better understanding of plant-soil interactions. In our project the *Fallopia sachalinensis* L. var. CANDY, a potential new crop for biogas production is investigated. It is a fast-growing plant with a high annual yield and currently there is a lack of information about its water consumption. The aim is to evaluate its water use and biomass production under different soil water availability and the effect of nitrogen fertilization on the yield-transpiration relation. To describe the process involved in the soil-plant-atmosphere system semi-controlled environmental conditions are required. We established the plants in lysimeters under a light transmissive roof. The water is supplied automatically in relation to the volumetric soil water content (SWC 7%, 10% and 14%) with a basic fertilization of 50kg N/ha and Hoagland solution. To evaluate the fertilization effect, well watered plants (SWC 14%) have been fertilized with calcium ammonium nitrate (N) at rate 0, 50, 100 and 150kg N/ha. At leaf level the ecophysiological plant performance is investigated with a gas exchange system to determine transpiration rate and CO₂ exchange and linked to the experimental water balance and the yield.*