

REMOVAL EFFICIENCY OF CONSTRUCTED WETLAND FOR TREATMENT OF AGRICULTURAL WASTEWATERS

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Abstract. Constructed wetlands were proven to be the efficient method for treatment of agricultural wastewaters in last two decades. In this study, the performance of a constructed wetland for treating wastewater from small farm was tested. The constructed wetland for 75 PE with horizontal subsurface flow at Chrámce, Central Bohemian Uplands, Czech Republic, was built in 2011. A hybrid constructed wetland combining the horizontal (HF), vertical filter (VF) and horizontal (HF) filter stages has been designed to treat wastewater from the agriculture production (processing of fruits, sheep, pigs, production of jams, spirits and wine, etc.). The mechanical pretreatment consists of two accumulation tanks (for different wastewater types) from which the wastewater is intermittently pumped into a settling tank. The treatment system consists of two horizontal flow beds and one vertical flow bed with intermittent feeding. The filters are planted with *Phragmites australis*, *Phalaris arundinacea*, *Iris pseudacorus*, *Iris sibirica*, *Glyceria maxima* and *Lythrum salicaria*. For tertiary treatment, three shallow ponds with littoral vegetation were designed. During the feed batch operation the inflow values up to 25.400 mg/L COD and 2.640 mg/L BOD₅ were reduced by up to 99%. The volume of each feed batch was applied at one to five day intervals. Also, the effect of discharged water on the littoral zone of aquatic biotopes has been evaluated. This knowledge is necessary for the design of a stable, artificial water system.

Keywords: constructed wetland, agriculture wastewater, hybrid systems, horizontal filter, vertical filter.

Received: 31 March 2017/ Revised final: 4 April 2017/ Accepted: 17 May 2017
