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# Micrometeorological measurements and SVAT model applications in Zagreb vineyard

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As part of the VITCLIC (VITiculture and CLImate Change in Croatia) project and the Croatian-Hungarian bilateral scientific program, micrometeorological measurements are performed at the Faculty of Agriculture in the Jazbina Experimental Station vineyard (in the vegetation periods 2017–2018 and 2018–2019). Relative humidity and temperature (Vaisala sensors), wind speed and direction (3D Gill sonic), UV radiation (Kipp & Zonen), leaf wetness (L-237 from Campbell) and leaf temperature (IRTS-P infrared sensor) were measured inside the cordon rows. Temperature, relative humidity (Vaisala HMP45) and wind speed gradient (1 Hz Gill and one cup anemometer) have also been measured above the plants on a 10 m high tower. Radiation budget components were detected with CNR1 net radiometer (Kipp & Zonen). Heat flux into the soil and the soil temperature and moisture profiles from the surface to a depth of 1 m were also determined. Two soil heat flux plates (HFP01-L) were set at 8 cm depth. Measurement frequency was 5 sec and the averaging interval was 1 min using Campbell data collecting systems (CR3000 and CR23X). The structure of the dataset, calculation of energy budget components based on Bowen ratio and gradient methods and the quality control, and gap filling processes are presented.
Different types of SVAT (Soil-Vegetation-Atmospheric Transfer) models are also applied to the Jazbina dataset. The models range from simple bucket model requiring only a few daily data to complex land-surface models (Noah) with requirements of high temporal data resolution were applied. The goal of this study is to analyze the variability of different methods and their feasibility using the measurements from July to November 2017. Comparing the model results with the observations, we concluded that i) the more complex models are not necessary better, ii) modelled soil moisture tendencies are captured by model simulations, but site precipitation measurement would be more ideal and iii) soil hydrophysical properties greatly affect solutions – soil texture type does not contain enough information.