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Crop water footprints under current and future climate conditions in Austria

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In the frame of the COST action ES1106 crop water footprint studies were carried out for several agricultural regions in Europe by use of the crop-soil water balance model AQAUCROP. For Austria the crop water use of 6 main crops were analysed for current and future (2050s) climate conditions in that context. The results show significant regional differences in total crop water footprints over Austria due to climate and soil conditions and related yield potentials. Among the considered annual crops sunflower, winter wheat and maize have the highest total water footprints. In Austria the green water footprint is dominant, in absolute terms, especially for maize and winter wheat. Maize and winter wheat show higher blue water footprint in regions with higher evaporative demand (in case of irrigation, i.e. Marchfeld region). Strong increasing blue water footprints especially for summer crops with small increase or decrease in total water footprints in case of irrigation under 2050s climate scenarios were simulated (no CO_2 effect on water use efficiency was considered). In the same time also significant increases in green water footprints are expected for not irrigated crops or regions. The soil with lowest available water capacity (Parachernozem) shows the highest simulated total and blue water footprints and irrigation demand. Care has to be taken on the calculation of green water footprint for rainfed conditions, when in dry years or at dry sites crop model do not well reflect yield decrease (i.e. too much yield decrease). A check against statistical yield levels is recommended for rainfed conditions in any case.