EMS Annual Meeting Abstracts
Vol. 10, EMS2013-437, 2013
13th EMS / 11th ECAM

Future projections for European viticulture and associated uncertainties

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Viticulture is a climate sensitive crop since optimum growth conditions are usually limited by atmospheric factors. Owing to the importance of the viticultural sector in Europe, the assessment of future impacts in European viticulture is of utmost relevance. A 16-member ensemble of regional climate models (generated by the ENSEMBLES project) following the historical (20C) and the A1B scenario is used to derive climate change projections for four viticultural bioclimatic indices. Focus is given to the period 2041-2070. After model data calibration and validation using an observational gridded daily dataset (E-OBS), changes in ensemble means are discussed taking into account the ensemble uncertainties. Over southern Europe, the projected warming combined with excessive dryness is expected to have detrimental impacts on winegrape development and quality, requiring additional measures to deal with heat and water stress. Additionally, for central European winemaking regions, the expected warming combined with increased humidity levels lead to an enhancement of pest/diseases. This may imply the necessity of cultivating better adapted vineyard varieties. Over northern Europe, changes in climate may create more favourable conditions for winegrape growth. Despite the high uncertainties found for some of the bioclimatic indices, climate change is expected to impose new challenges for the European winemaking sector. Adaptation measures need to be adequately and timely planned, in order to cope with climate change impacts on viticulture.