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Adaptation options to future climate of maize crop in Southern Italy examined using thermal sums

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Future climate scenarios predict substantial changes in air temperature within a few decades and agriculture needs to increase the capacity of adaptation both by changing spatial distribution of crops and shifting timing of management. In this context the prediction of future behaviour of crops with respect to present climate could be useful for farm and landscape management.
In this work, thermal sums were used to simulate a maize crop in a future scenario, in terms of length of the growing season and of intervals between the main phenological stages. The area under study is the Sele plain (Campania Region), a pedo-climatic homogeneous area, one of the most agriculturally advanced and relevant flatland in Southern Italy. Maize was selected for the present study since it is extensively grown in the Sele Plain for water buffalofeeding,.
Daily time-series of climatic data of the area under study were generated within the Italian project AGROSCENARI, and include maximum and minimum temperature and precipitation. The 1961-1990 and the 1998-2008 periods were compared to a future climate scenario (2021-2050). Future time series were generated using a statistical downscaling technique (Tomozeiu et al., 2007) from general circulation models (AOGCM).
Differences in crop development length were calculated for different maize varieties under 3 management options for sowing time: custom date (typical for the area), before and after custom date. The interactions between future thermal regime and the length of growing season under the different management options were analyzed. Moreover, frequency of spells of high temperatures during the anthesis was examined. The feasibility of the early sowing option was discussed in relation with field trafficability at the beginning of the crop cycle.
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