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Climate variability and changes in the agrarian cycle in the Czech Lands from the 16th century

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The paper analyses the influence of long-term climate variability on changes of the agrarian cycle in the Czech Lands during the last five centuries. For two model areas, the Louny region in north-west Bohemia and the Elbe region in central Bohemia, series of different crops and wine harvest dates were compiled from rich documentary evidence for the periods of 1517–1542, 1561–1622, 1770–1815, 1871–1910 and 1971–2010. Fluctuations in the selected agricultural series are compared with those expressed in temperature, precipitation and Standardised Precipitation Evapotranspiration Index (SPEI) series for different combinations of months. Basic statistics of agricultural series are presented and these series are correlated with climatic variables. The earliest onsets of harvests occurred in the recent 1971–2010 period, which were comparable with the 1517–1542 period. Compared to these two periods, harvest dates were delayed in three remaining cooler periods. Air temperature, combined also with drought effect expressed by SPEI, played a significant role in the agrarian cycle in all periods analysed except 1871–1910, in which during rather wet patterns temperatures were highly dominant. Significant influence of summer precipitation appeared in first three periods analysed. Correlation coefficients of agricultural series with temperatures document increasing weight of this factor during centuries. Possible effects of uncertainties in agricultural and climatic data in results obtained are discussed, as well as relationship of the agrarian cycle to climate variables and its broader context. (This work was supported by Czech Science Foundation, project no. 17-10026S “Drought events in the Czech Republic and their causes”.)