



Meteorological conditions for extreme crop yield seasons

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Year-to-year variability in crop yield causes large variability in yearly total crop production. This variability in production causes uncertainty in farmers' income and destabilisation of food supply and food security world wide. We use a large model ensemble generated using the global climate model EC-Earth to characterise the meteorological conditions of highest impact on crop yields and production. We use a new approach of investigating high impact events: selecting by impact rather than by the extremeness of a chosen meteorological variable. This direct selection approach allows for compound extreme events (events caused by multiple, statistically related variables) to be included in the analysis and guarantees the events of highest societal importance are the focus of the study. We discuss the meteorological conditions that lead to the seasons of extreme crop production. We show that these are not necessarily extreme seasons in meteorological or climatic terms, since crop yield may vary due to relatively small deviations in, for example, temperature or precipitation at a significant periods in the growing season.