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Climate extremes in the wheat producing regions of the world

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Climate extremes, such as heat waves, drought and heavy rainfall, can have severe impacts on agriculture. The occurrence of these extremes during critical crop growth phases (i.e. anthesis and grain filling) can cause pronounced yield anomalies, economic losses and trigger market volatility and price spikes. In this study, we attempt a characterisation of climate extremes occurred from 1980 to 2010 in the key wheat producing regions of the world. We focus on large-scale events and we adopt recently proposed measures to characterise heat stress, drought and over-wet conditions. We propose an innovative statistical approach based on inhomogeneous marked point process to analyse the temporal patterns of the identified extremes and especially their recurrence and co-occurrence.