



Identifying future threats: impact of climate change on wheat

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The frequency and magnitude of extreme weather events are likely to increase with global warming. However, it is not clear how these events might affect agricultural crops and whether yield losses resulting from severe droughts or heat stress will increase in the future. The aim of this paper is to analyse changes in the magnitude and spatial patterns of two impact indices for wheat: the probability of heat stress around flowering and the severity of drought stress. To compute these indices, we used a wheat simulation model combined with high-resolution climate scenarios based on the LARS-WG stochastic weather generator and the output from the Hadley Centre regional climate model at 18 sites in England and Wales. Despite higher temperature and lower summer precipitation predicted in the UK for the 2050s, the reduction in grain yield related to drought stress is predicted to be smaller than that at present, because wheat will mature earlier in a warmer climate and avoid severe summer drought. However, the probability of heat stress around flowering, that affects pollination and might result in considerable yield losses, is predicted to increase significantly. Breeding strategies for the future climate might need to focus on wheat varieties tolerant to high temperature rather than to drought.