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## Loss of climatic suitability for durum wheat production

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Durum wheat (*Triticum durum Desf.*) is a minor cereal crop of key importance for making pasta, couscous, puddings, bread, and many other traditional foods, due to its physical and chemical characteristics. Durum wheat currently represents around 8% of the total wheat crop production, with the main cultivation region being concentrated in few suitable areas such as the Mediterranean Basin, the North American Great Plains, and the former USSR. The global demand for high-quality food made of durum wheat has been increasing, which poses a challenge in the face of climate change. The major share of durum wheat production is currently located in semi-arid climates, where the risk of climate extremes such as drought and heat stress will likely substantially increase in the future.

We develop a global climate suitability model for durum wheat growth based on Support Vector Machines. We use CMIP6 data to assess the impact of climate change on future suitability for growing durum wheat globally. The total share of global arable land, climatically suitable for growing rainfed durum wheat, currently represents roughly 13% of the global arable land. However, climate change may decrease this suitable area of 19% by mid-century and of 48% by the end of the century, considering also the gain of suitable land areas, where durum wheat is not cultivated today. This net loss of suitable areas requires the development and the future adoption of effective and sustainable strategies to stabilize production and adapt the entire food supply chain.