

Food production in a changing climate

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Key messages

- The impacts of climate change will be a serious threat to food security
- Short periods of high temperatures during flowering time can seriously reduce yields of annual crops like groundnut, wheat and rice



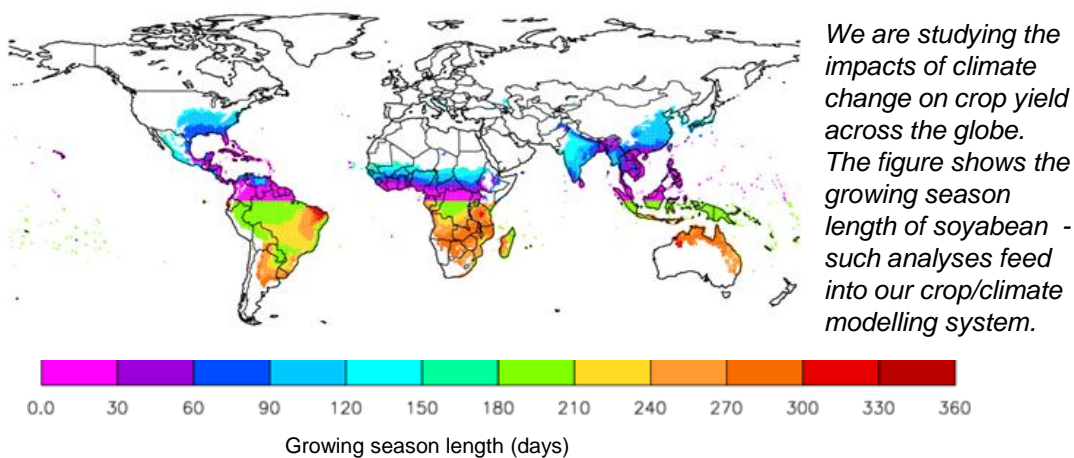
Climate affects food security

The impacts of climate change on crops will be a serious threat to food security in tropical and temperate regions.

Crops are sensitive to weather and climate. Much of the world's supply of staple food - crops such as rice and maize – is produced in the tropics where weather and climate can vary dramatically from year-to-year.

We have developed new prediction methods to study how climate affects crops across the world, and to consider ways to cope with climate change – such as specifying new crop varieties.

We also work on seasonal forecasts of crop yield - of real benefit to farmers and policymakers, and famine early warning systems in vulnerable regions.



Higher temperatures can seriously reduce crop yields

Under climate change, crops in many regions will be prone to environmental stresses not observed in today's climate.

By the end of the 21st century short periods of hot temperatures that are found in some regions in the current climate will be found over a wider area. If these occur at flowering time then the harvest of annual crops such as groundnut, wheat and rice can be seriously reduced.



Rice plants showing the effect of high temperature: only the brown grains (left) contain seed that will be harvested (right)

Crops can affect regional climate

Crops can exert an influence on local and regional climate. We have incorporated this effect into a global climate model. Results indicate that in parts of India, the African Sahel and Brazil, crops increase the year-to-year variation in their growing season temperature by up to 40%.

This suggests that in these regions some fraction of crop yield variability is due to the indirect effect of crops as a dynamic part of the land surface. If so, this has implications for the forecasting of crop yields both seasons to decades ahead as current methods consider crop growth to be external to the climate system.

Our collaborators

The Crops and Climate Group collaborates with key research groups in the UK and internationally, such as the Hadley Centre at the Met Office, and research institutions in China, India and Brazil.

The findings of our research are published in specialist journals, books and conferences, as well as in popular articles and in the media.

Find out more.....

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