

# U.S. Crop Yields Could Wilt in Heat

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(PhysOrg.com) -- Yields of three of the most important crops produced in the United States - corn, soybeans and cotton - are predicted to fall off a cliff if temperatures rise due to climate change.

In a paper published online this week in Proceedings of the National Academy of Sciences, North Carolina State University agriculture and resource economist Dr. Michael Roberts and Dr. Wolfram Schlenker, an assistant professor of economics at Columbia University, predict that U.S. crop yields could decrease by 30 to 46 percent over the next century under slow global warming scenarios, and by a devastating 63 to 82 percent under the most rapid global warming scenarios. The warming scenarios used in the study - called Hadley III models - were devised by the United Kingdom's [weather](#) service.

The study shows that crop yields tick up gradually between roughly 10 and 30 degrees Celsius, or about 50 to 86 degrees Fahrenheit. But when temperature levels go over 29 degrees Celsius (84.2 degrees Fahrenheit) for corn, 30 degrees Celsius (86 degrees Fahrenheit) for soybeans and 32 degrees Celsius (89.6 degrees Fahrenheit) for cotton, yields fall steeply.

"While crop yields depend on a variety of factors, extreme heat is the best predictor of yields," Roberts says. "There hasn't been much research on what happens to crop yields over certain temperature thresholds, but this study shows that temperature extremes are not good."

Roberts adds that while the study examined only U.S. crop yields under warming scenarios, the crop commodity market's global reach makes the implications important for the entire world, as the United States produces 41 percent of the world's corn and 38 percent of the world's soybeans.

"Effects of climate change on U.S. [crop production](#) will surely be felt around the globe, especially in developing countries," he says.

More information: "Nonlinear temperature effects indicate severe damages to U.S. [crop yields](#) under climate change" Wolfram Schlenker, Columbia University and Michael Roberts, North Carolina State University; Published: Aug. 24, 2009, in the online version of [Proceedings of the National Academy of Sciences](#).

Source: North Carolina State University ([news](#) : [web](#))

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