Crop switching for climate change in China

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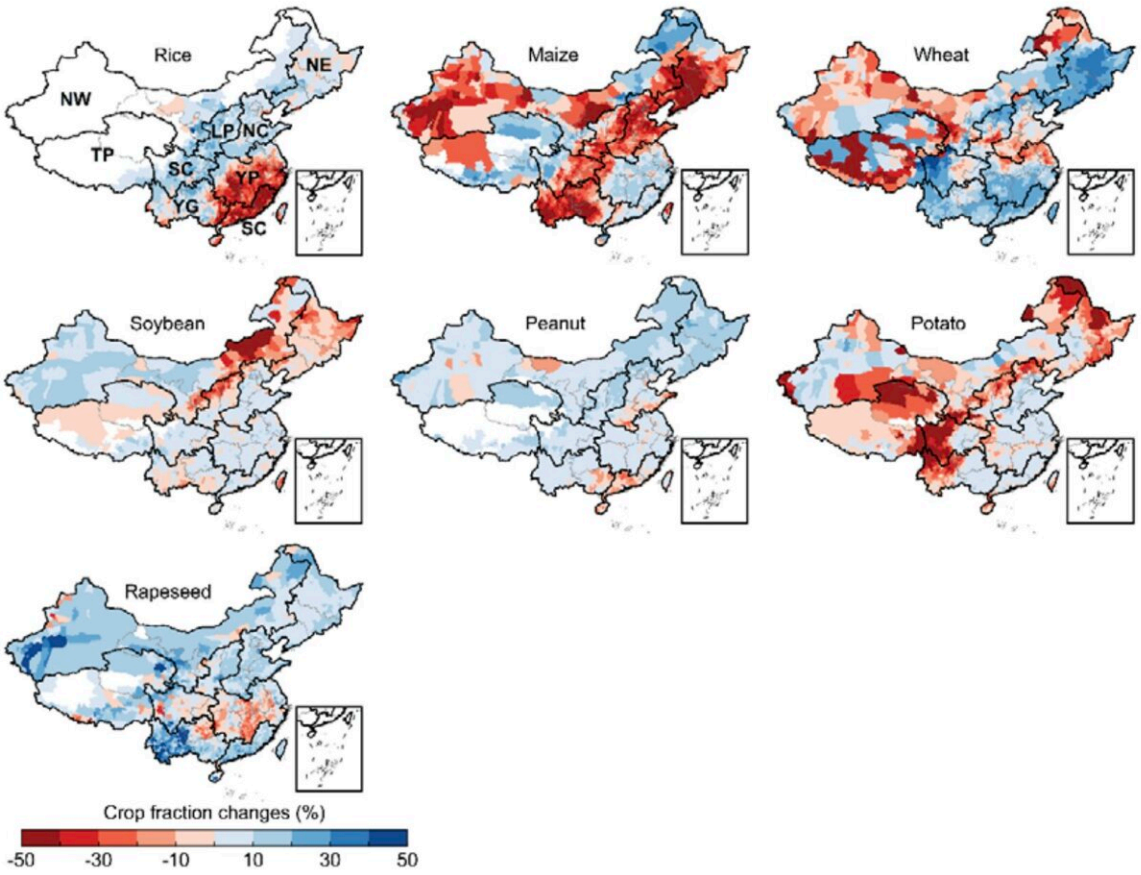

Spatial variations in county-based crop fraction changes, defined as the fraction of crop-sown area over total cropland area. Credit: Guan et al.

A study of Chinese agriculture recommends planting areas currently growing maize and rapeseed with alternative crops to reduce

environmental costs while maximizing food production as the climate changes.

Chinese food production has nearly doubled since the 1980s, mainly thanks to intensified nutrient usage and irrigation.

Given that China's demand for food is forecast to increase further, Qi Guan and colleagues modeled the country's agricultural system under varying climate change scenarios in the 21st century, using a dynamic global vegetation model. The study is published in the journal *PNAS Nexus*.

The authors created scenarios that maximized crop production while minimizing leached nitrogen and water use under various climate futures. The scenarios also minimized disruptions to supply chains and sought to promote future food security.

The optimal crop distributions increased productivity by 14.1%, reduced leached nitrogen by 8.2%, and reduced water use by 24.0% under the future climate.

Warming and increasing summer rain in northern China will make the area suitable for rice. Moving maize out of arid regions would save a significant amount of water. Drought-tolerant wheat could do well in the Northeast China Plain. Soy could thrive in northern and northwestern China, as well as the Yangtze Plain, and water-loving potatoes could do well in eastern and southern China.

According to the authors, crop switching at the national scale is possible in China with coordinated actions, with large potential benefits.

More information: Qi Guan et al, Improving future agricultural sustainability by optimizing crop distributions in China, *PNAS Nexus*

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