

Analysis: China could boost yields and cut emissions by switching from maize to soy

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A large team of researchers, mostly from China, with a few others from the U.S. and Canada, has found that if many of the farmers in China switched from growing maize to growing soy, the country as a whole

could boost yields while also reducing greenhouse gas emissions. In their paper published in the journal *Nature Food*, the researchers describe their county-level analysis of farming practices in China.

As the researchers note, [food security](#) has become a major issue with countries around the world. While some countries define the term as simply being able to feed their people, others define it as being able to feed the people in a given country with [food](#) produced in that same country. China in particular has made clear its desire to reduce reliance on food imports, and has specifically focused on growing more soy. Prior research has shown that the consumption of soy has increased four-fold in China since 2000, driven in part by an increase in consumption of animal products. But the country is currently able to produce just 10% of its needs. China currently imports approximately two-thirds of all soy being traded on the international market, putting the country at the mercy of foreign providers. China's massive importation of soy has also led to huge spikes in prices around the world. In this new effort, the researchers obtained and analyzed agriculture data for farms across China, down to the county level to find ways to increase production of soy.

The researchers focused their efforts on soy and maize production for over 1,800 counties and as part of their effort, they calculated the [yield gap](#) for each—the yield gap is the difference between yields that should be produced versus what is actually produced. In so doing, they found yield gaps as high as 50%—far higher than for other major soy producers. The team then conducted a reallocation analysis of the farms in each of the counties, where they simulated converting maize growing to soy growing. They found that if their recommendations were implemented, China would be able to boost its production of soy to 45% of demand—a significant increase. They also found that switching so much maize production to soy production would reduce emissions of reactive nitrogen significantly and reduce [greenhouse gas emissions](#) in

China attributable to soy and [maize](#) growing, by 19%.

More information: Zitong Liu et al, Optimization of China's maize and soy production can ensure feed sufficiency at lower nitrogen and carbon footprints, *Nature Food* (2021). [DOI: 10.1038/s43016-021-00300-1](#)

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